CHAPTER

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Fertility: Theories, Frameworks, Models, Concepts

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Demography *is largely a social science and is becoming more so*. In the special issue of *Population Studies* to commemorate the journal's 50th anniversary, John Caldwell reached this conclusion after an assessment of demography's position in the scientific world (Caldwell, 1996). The unique character of demography may lie in the discipline's emphasis on quantification, analytical models, censuses, and large-scale sample surveys. It remains, nevertheless, a social science in that the central subject it deals with—population and population dynamics—is a social phenomenon: emerging from the aggregation of individual life events, to a great extent socially determined and with profound social consequences. The situation is aptly described by Schofield and Coleman (1986) in their introduction to *The State of Population Theory*. They characterized demography as a discipline with a hard mathematic core and a softer surrounding of an explanatory body of theory. Whereas this mathematic core has been called *a point of proper disciplinary pride* (McNicoll, 1989, p. 433), its development is not paralleled by an equally mature development of theory. The emerging picture of demography is that of an accurate, but relatively dull science; strong in accountancy, but relatively weak in conceptualization.

This unbalanced state of affairs is a matter of concern to many demographers. Schofield and Coleman, for instance, stated that

> Any subject which finds it necessary, or indeed possible, to consider its material divorced from an appropriate body of theory must be in trouble. This seems to be the case with demography at present (Schofield and Coleman 1986, p. 1).

During the development of the discipline of demography in the past decades, similar statements have repeatedly been made (e.g., Vance, 1959; Ford and De Jong, 1970; McNicoll, 1980, 1992; Greenhalgh, 1995b). Indeed, a one-sided sophistication of data collection and mathematic analysis can never substitute the role of theoretical fundament for the formulation of research questions and the interpretation of data. To reach a true understanding of demographic phenomena, we require theories, conceptual frameworks, and models that identify the causal mechanisms underlying the relations between relevant variables (Wunsch, 1995).

Demography traditionally focuses on three main subjects—fertility, mortality, and migration—and of these three, fertility has perhaps the most abundant and comprehensive theoretical foundation. However, even here complaints can be heard that although demography has yielded adequate descriptive instruments, the emerging vision is still insufficient; at least insufficient to be relevant for concrete situations (e.g., Freedman, 1987; Handwerker, 1986; McNicoll, 1992; Ryder, 1983; Willekens, 1990a). This may seriously impede development in areas in which demographic expertise is called on, such as the provision of sound population forecasts (Willekens, 1990b) or the underpinning for efficient and effective population policies (Andorka, 1989; Tsui *et al*., 1992; World Bank, 1992). These complaints should not, however, disguise the fact that these inadequacies are not typical of demography alone, but represent the situation of social sciences in general. Furthermore, over the years a sub-

stantial number of theoretical orientations have entered the realm of fertility studies, leading to new and complementary insights.

THE STRUCTURE AND DEVELOPMENT OF FERTILITY THEORY

More than probably any other social science, demography is identified and demarcated by its subject matter—population and population change—rather than by conceptual premises of how to study it. The easily quantifiable nature of the major phenomena of interest bolsters up this empiricist bias. Other disciplines—economics, sociology, history, anthropology, biology, psychology and medical science—have invaded the relative vacuum of theoretical substance, justifying the label demography as an *interdiscipline*(Mayone Stycos, 1987). If this represents the status of demographic theory in general, it equally pertains to that of the theoretical body that deals with fertility, although several approaches are firmly grounded within the borders of demography itself. The resulting theoretical landscape of fertility is a colorful and mountainous patchwork of ideas, often without much coherence or substantial cross-fertilization. Leridon (1982) depicted the situation as a *cubist painting*, and in a recent overview of half a century of research into the determinants of fertility, van de Kaa (1996) recounts it as an evolving story consisting of a series of subnarratives from different disciplinary orientations. Each of these disciplinary approaches introduced a different perspective, a specific focus, methodology, level of analysis and assumptions about the mechanisms underlying reproductive behavior. In this respect, Hauser and Duncan's observation that demographic inquiry did not yield a principle coherent body of knowledge to explain the discipline's phenomena of interest is still valid today (Hauser and Duncan, 1959). A *grand unifying theory* remains far beyond the capacities of the discipline (Freedman, 1987; van de Kaa, 1996; Schofield and Coleman, 1986; Wunsch, 1995) and, for that matter, of any social science.

However, the inclination to adopt insights from neighboring sciences to study the determinants of fertility has not proven to be a guarantee to keep up with the developments at the frontiers of knowledge in these fields (Greenhalgh, 1996; McNicoll, 1992). The application of micro-economics theory has largely stuck to the new-home economics of 15 to 20 years ago and there seems to have been little development in psychological theorizing in demography since the emergence of the *value-of-children* concept in the 1970s and the early applications of the Fishbein-Ajzen type of attitude models. The notion of culture in demographic studies is notoriously reduced to austere proportions—if it is conceptualized at all—and stands a long way from the evolution of cultural understanding in the last decades (Greenhalgh, 1995b; Hammel, 1990; Handwerker 1986). New institutional approaches, social learning theory, and cognitive sciences in general have hardly touched the work of demographers or have only recently entered the field (Burch, 1980; McNicoll, 1992). Some theoretical traditions—like phenomenology, holistic anthropologic approaches—have never made it into the canonical streams of demography because they stand too far apart from the starting points of objectivity and quantification that are valued in demographic inquiry.

Nevertheless, theoretical developments in other social and behavioral sciences had their share in the shifts that occurred in the main orientations of fertility research. A prominent example is the application of economic decision models to fertility since the 1960s in the wake of the general expansion of the economic principles of consumer choice into other life domains. But other forces also operate on the direction of fertility research and its conceptualization. Thus, the availability of a huge amount of data after the series of the World Fertility Surveys (WFS) and the Demographic and Health Surveys (DHS) has been an important factor in the popularization of Bongaarts' model of proximate determinants of fertility. Partly also, demography followed the fashion of the day in scientific and policy circles: the prewar flirt with—and subsequent hasty abandonment of—eugenics, the attachment to the family planning movement, the nexus between population and environment and, especially since the run up to the 1994 International Conference on Population and Development in Cairo, the issue of reproductive health. Several authors have dealt in this respect on the influence of governments, pressure groups, scientific journals, funding agencies, and intellectual and institutional backgrounds (e.g., Caldwell, 1996; Caldwell and Caldwell, 1986; Demeny, 1988; Greenhalgh, 1996; McNicoll, 1992; Szreter, 1993).

In spite of the disciplinary variety in the approaches to fertility and the various orientation shifts over time, explaining the differences and changes in patterns and levels of fertility continues to be a central concern for demographers. In this respect, the theory of demographic transition offers a paradigmatic framework in which each of the theoretical contributions can be viewed as part of the total explanation of the generally observed trend from high to low fertility (Beaver, 1975; van de Kaa, 1996; Kirk, 1996). To organize a review of theories and models of fertility, one dimension that

may therefore be used is the relevance of these theories for the explanation of fertility in the different stages identified in the perspective of demographic transition. Thus, the model of proximate determinants and its underlying concept of *natural fertility* bears particular relevance for the situation in (pretransition) historic populations and in many contemporary developing countries, whereas psychological choice models are fairly limited to the explanation of fertility in (posttransition) developed countries, and diffusion approaches seem to apply to the transition stage in between. Another, and perhaps even more important, criterion to classify theories and models of fertility is their emphasis on macro- or microlevel explanation. To provide a full understanding of fertility and fertility change, we must encompass both the structural determinants of the embedding context and the role of individual and intraindividual processes, and, consequently, the mechanisms that relate macro- and microlevels (de Bruijn, 1999; Greenhalgh, 1990; McNicoll, 1994; Wunsch, 1995).

The subsequent sections will address the major lines of thought in current demography as far as they are relevant to the study of fertility. We will leave aside strict mathematic demographic theories—stable population theory, the work of Lotka, model life tables, and so forth—and theoretical considerations in other disciplines that deal with the analysis of fertility—such as economics and anthropology—but remain outside mainstream thinking in demography.

Malthusian Thoughts and Population Theory

Ideas and observations with regard to fertility and population can be traced back to classic antiquity and ancient Chinese philosophers. Although these considerations foreshadowed the development of many principles of population, population growth, and development, and often addressed the implications for public policy, they remained largely speculative and at a low level of generalization (United Nations, 1973). The writings of Malthus at the end of the 18th and beginning of the 19th centuries are usually credited with being the first systematic account of the principles of population change. Malthus' body of thought was clearly rooted in the political, economic, and social issues of his time. The core of his first *Essay on the Principle of Population*, published in 1798, is the idea that the capacity of human populations to reproduce is (in principle) unlimited and proceeds with a geometric ratio, whereas the capacity to produce the means of subsistence is necessarily limited and increases at best in arithmetic fashion (Malthus, 1976). In subsequent versions of his *Essay*, Malthus further developed his theory and added various considerations.

The belief that population and means of subsistence increase with different ratios means that populations will grow where food production increases, but that eventually they will face a level where no more people can be sustained and any surplus population will die of starvation. Whereas Malthus maintained that populations always tended to a maximum increase, they were limited by the *positive checks* of mortality. These positive checks not only included famine and starvation, but also other *misery*, such as epidemics, wars, and plagues. In addition, he conceived of a number of *preventive checks*, which operated through people's voluntary acts to limit their number of children. The major principle Malthus saw in this respect—although it surprisingly only appeared in his later writings—was deferring marriage or refraining from marriage altogether. The other *moral restraint* he acknowledged—sexual abstinence within marriage—was considered ineffective because of the overpowering *passion between the sexes*. Malthus' world view (particularly as that of a clergyman) was violently opposed to other means of birth control, like abortion and contraception.

Since its inception, the Malthusian project has been often and severely criticized on empirical as well as ideologic grounds, and indeed it is still the subject of heated debate among scientists and policymakers (Rothchild, 1995). One of the main lines of attack concerns Malthus' assumption of the capacity to increase agricultural output. Preceded by many others, Boserup's orientation is a main contender of Malthusian theory. She advances that technologic progress might keep food production ahead of population increase (e.g., Boserup, 1981; see also J. L. Simon, 1977). In her view, population growth, and particularly increasing population density, is a main stimulus to innovative techniques in agriculture. Moreover, she reverses the Malthusian logic by suggesting that technologic progress only occurs under pressure of population growth. In other publications, Boserup elaborated on the intricate links between technology and fertility, asserting that modes of production have far-reaching effects on marriage patterns, gender relationships, and reproduction (Boserup, 1970, 1990).

Another shortcoming of Malthusian reasoning is its failure to distinguish the power of populations to increase from their tendency to do so. Many anthropologic studies (e.g., Bledsoe, 1990; Kreager, 1982, 1986; Howell, 1979, 1986) have shown that populations have a large variety of mechanisms at their disposal to keep population size in accordance with the carrying

capacity of their environment, ranging from marriage patterns and migration to contraception and child fostering. However, this is an adaptation of the Malthusian scheme of balancing population and subsistence rather than a rejection, and in this respect Malthus' ideas remain an important background of fertility analysis.

This is also the case with regard to public policy and developmental issues. Despite the recognition that technologic innovations keep on pushing up the limits of population growth, the essence of the problem continues to permeate the debate, not only with regard to the food supply, but also in the broader perspective of sustainable development with regard to the exhaustion of non-renewable sources of energy (Meadows *et al*., 1972), global warming (Flavin, 1989), water scarcity (Falkenmark, 1990), soil erosion (Brown, 1989), global deforestation (Myers, 1990), and so forth.

The Theory of Demographic Transition

For most of this century, demographers and social scientists have been intrigued by the regularities of demographic change in many different settings all over the world. These regularities were considered so remarkable that their occurrence spurred the development of the major body of conceptualization available to demography. The apparent process of *demographic transition* proceeds in the course of modernization and economic development from a situation characterized by high mortality and high fertility to one where mortality and fertility are low, via a stage with declining death rates and declining birth rates lagging behind. This notion of demographic transition gained full momentum only after the seminal publications by Davis (1945) and Notestein (1945), although the full essence of the contingency between modernization and declining mortality and fertility, as well as the three-stage evolution had already been comprehensively formulated by Thompson in 1929. The major elements had also been addressed by Landry (1909, 1934) and in the ethnographic wealth of the work of Carr-Saunders (1922, 1964/1936).

The classic representation of the demographic transition, as for instance sketched by Notestein, claimed that mortality declined in the wake of the industrial revolution, which brought material changes in the sense of agricultural innovation, better communication, higher productivity, and improved health conditions. Fertility was much less responsive to such modernization and its decline depended to a large extent on the collapse—following mortality decline—of ideational and normative systems that supported high fertility.

In the past decades, what started out as a mere description or explanation of historic trends of mortality and fertility in Europe has become increasingly elaborated and has incorporated additional considerations, like different conceptualizations of modernization and the shift from socioeconomic to cultural–ideational and psychological determinants of fertility decline. The principles of historic demographic transitions were thought to be applicable to any contemporary situation in the sense that every nation, region, or population could be located on the evolutionary track of modernization and mortality and fertility decline. Other notions that transformed the concept from empirical observation to theoretical assumption posit that a substantial mortality decline invariably precedes a major decline in fertility, that the mortality decline is followed inevitably by reduced fertility, and that once a substantial fertility decline has been established, the process is irreversible and inescapable. In these respects, the notion of demographic transition has increasingly been considered as a theory with universal validity and predictive power. It is in this respect worthwhile mentioning that Dudley Kirk, another demographer who contributed to the initial formulation of the demographic transition concept, claims that neither Notestein nor Thompson initially thought of their ideas as a theory (Kirk, 1996).

In 1973, Ansley Coale stated that

> The power of the demographic transition concept . . . lies in the undeniable fact that with sufficient modernization fertility and mortality change in a predictable manner.

But the weakness of the concept, according to Coale, is

> The difficulty of defining a precise threshold of modernization that will reliably identify a population in which fertility is ready to fall (Coale, 1973, p. 64).

Thirteen years after Coale's remarks in what can be considered the last monument in the tradition of the demographic transition theory, Chesnais had to phrase the strengths and limitations of the theory in almost identical terms (Chesnais, 1986). Meanwhile, Coale and his associates from Princeton University had tried by means of a large-scale survey to identify the crucial variables that had determined the onset and pace of Europe's fertility transition. Their attempt failed in the sense that their study could not find any socioeconomic indicator of modernization that could unequivocally explain the occurrence of fertility decline in Europe (Watkins, 1986). Socioeconomic factors, which were emphasized by transition theory, appeared to be either spurious or inconsistent in the explanation of the timing of the decline or its tempo The simultaneous fertility decline in Hungary and England is a case

in point, as in terms of socioeconomic indicators, Hungary lagged far behind England, at that time economically the most advanced nation in the world. With regard to contemporary societies, China, Kerala State, and Sri Lanka may also serve as illustrations, because there fertility is near or even below (Kerala) replacement level without meeting the assumed requirement of socioeconomic development. Bangladesh, one of the least-developed countries in the world, may be another good candidate, given the significant fertility reduction observed there. Evaluating the contemporary record on the onset and pace of the fertility transition, Bongaarts and Watkins (1996) found an enormous diversity in each of the socioeconomic indicators applied, confirming the conclusions of the Princeton study of historic Europe.

The presupposed sequence of mortality and fertility decline has also been called into question. In a historic perspective, France is the classic example of analysis contradicting the idea that mortality decline preceded fertility decline (E. van de Walle, 1978). Evidence from the Princeton study suggested that France was not an isolated case, and there is no statistical evidence for a general trend in the sequence of mortality and fertility decline (F. van de Walle, 1986). Sometimes fertility decline was found to follow a fall in infant mortality, sometimes it preceded it, and often they dropped simultaneously. Chesnais (1986), however, argues that some of these findings are based on methodologic inadequacies and in second instance results appear to be in accordance with the theory. Nevertheless, the exact causal relation between the decline in mortality and fertility remains difficult to establish (van de Kaa, 1996).

Although the theory of demographic transition suggests a historic perspective, the construct is largely devoid of time and change except for the intermediate stage of transition (Greenhalgh, 1995b). In the framework of transition theory, there is no history in either the pre- or the posttransition stage: In terms of development, time stands still. According to Greenhalgh (1994), many descriptions and analyses of fertility within the perspective of transition theory exist in historic vacuums and are not guided by the notion that the specific histories of the social environment can bear much relevance to their fertility patterns (McNicoll, 1994). The suggested homogeneity and immobility of *traditional* societies—historic or contemporary—is indisputably refuted by the empirical demographic record, which shows a large variety of fertility patterns and levels (Blake, 1985). Neither could transition theory adequately cope with the significant (although temporary) posttransition, postwar reversal of fertility trends in a number of Western countries, which resulted in the *baby boom* cohorts. To dispose of such phenomena as *temporary blips* (Kirk, 1996) is totally unsatisfactory and unacceptable given the huge impact they can—and do—have on society. Also, to find solace in an equilibrium or homeostatic framework, as Kirk suggests, to take account of the problem of where the fertility decline will eventually end, probably reflects more normative hope than a realistic forecast. The observation that in most European countries fertility dropped below the level of mortality—where transition theory assumed it to end—and a supposed historic inflection point in European society, inspired the conceptualization of a *second demographic transition* (Lesthaeghe and van de Kaa, 1986; Lesthaeghe and Verleye, 1992; van de Kaa, 1987).

Greenhalgh, among others, rightly claims that many of the assumptions of transition theory closely resemble those of evolutionary theories that formerly featured in anthropology and raise similar contempt with regard to overdue generalization, Eurocentrism, and supposed unilinearity of development (Greenhalgh, 1989, 1995b; Handwerker, 1986). Although the concept of demographic transition (or its fertility transition subset), if seen from sufficiently afar, stands better against the empirical record than comparable evolutionary thought in anthropology, closer scrutiny supports this criticism: There seem to be many roads to lower fertility, and onset and pace of the decline cannot be predicted anywhere near satisfactorily. This confirms the truth of Greenhalgh's statement "that the closer we get to understanding specific fertility declines, the further we move from a general theory of fertility transition" (Greenhalgh, 1990, p. 85). Therefore, the practical content of transition theory—either in terms of revealing the specific determinants of demographic change or in terms of providing tangible handles on population policies—is less than it initially promised. Szreter in this respect reflected that

> The principal [sic] virtue and function of the idea of demographic transition has always been in providing a graphic metaphor that summarily describes—and predicts—a long-term overall emergent pattern of change. As such it has enormous justification, motivational, and communicative value for agencies and institutions wishing to effect change. But, . . . a summary description of this metaphorical sort offers no necessary assistance or insight into the causal explanation of how such change occurred or occurs in any particular case (Szreter, 1993, p. 692).

What we need to explain and predict population development or design population policies is specific knowledge of particular settings and the mechanisms of social change and structure–agency interaction (Greenhalgh, 1988, 1990; McNicoll, 1992, 1994; Szreter, 1993; Teitelbaum, 1976; Willekens, 1990a, 1990b) and

this cannot be adequately provided by the transition framework.

Biology and Proximate Determinants

A notion often associated with the transition from high to low fertility is the idea that in the posttransition stage, fertility is under complete control of couples and individuals, whereas in the pretransition stage it is to a large degree left to biologic principles, although constrained by socially constructed bounds. This notion was already conceived in the work of Landry, but the analysis of fertility in pretransition populations has immensely improved since Louis Henry's (1953) development of the concept of *natural fertility*. Henry defined this concept as fertility that existed in the absence of deliberated control through abortion or contraceptive practice, implying that reproductive behavior does not depend on the number of children already born to a couple. In these natural fertility situations, reproduction is determined by biologic principles, such as age at menarche, fecundability (the monthly probability of conception), time required for gestation, intrauterine mortality, and postpartum amenorrhea. In addition, fertility is determined by a number of social–behavioral factors, which are—at least from the point of view of the couples concerned—not intended to restrict childbearing. These factors might include marriage patterns (in particular as far as related to marital duration), spousal separation, (religious) rules for sexual abstinence in certain periods, and duration and intensity of breast-feeding, with its effects on the period of postpartum amenorrhea. The observed levels of natural fertility differ widely between societies especially because of the wide differentiation in these social mechanisms (Blake, 1985). It is, however, not always easy to establish whether behaviors are socially or individually determined and whether birth control considerations are involved. Thus, although people may want to abstain from sexual intercourse on the basis of normative rules, the efficacy of this may depend on motives of child health, birth spacing, and, for that matter, limitation of offspring (Caldwell *et al*., 1982; Kakar, 1989; Knodel, 1983).

The concept of natural fertility has evolved over time (Henry, 1957, 1961; Leridon, 1977; Leridon and Menken, 1979) and has found its culmination point in the model of proximate determinants as developed by Bongaarts (Bongaarts, 1978; Bongaarts and Potter, 1983). Earlier, Kingsly Davis and Judith Blake provided a seminal contribution with the development of an analytical framework of intermediate determinants of fertility that affected either the exposure to intercourse or the exposure to conception or gestation and successful parturition. Divided over these three categories they identified eleven behavioral and biologic factors "through which, and only through which, any social, economic and environmental variable can influence fertility" (Davis and Blake, 1956, p. 214). Bongaarts further developed this framework by quantifying the effect of Davis and Blake's intermediate variables and collapsing them into eight, and later seven, proximate determinants of fertility. This resulted in a simple but powerful model for analyzing how fertility changes over time or differs from one group to another: Any level of fertility in a population can always be traced to variations in one or more of the following determinants:

1. The proportion of women of reproductive age that is married (as a measure of the proportion exposed to sexual intercourse)
2. The use and effectiveness of contraception
3. Induced abortion
4. Postpartum infecundability (as primarily determined by the duration and intensity of breast-feeding)
5. The frequency of intercourse (including the effect of temporary separation and abstinence practices)
6. The onset of permanent sterility (particularly as related to menopause)
7. Spontaneous intrauterine mortality

Each of these factors contributes to a reduction of the approximately 15 children a woman can have during her reproductive career. The empirical evidence showed that marriage, contraceptive practices, abortion, and postpartum infecundability have by far the strongest effect on levels and differentials of fertility (Bongaarts, 1993; Bongaarts and Potter, 1983). The model suggests therefore that the total fertility rate can be described as:

$$TFR = C(m) \times C(c) \times C(a) \times C(i) \times TF \qquad (2)$$

where TFR is the total fertility rate, C(m) is the index of proportion married, C(c) is the index of noncontraception, C(a) is the index of induced abortion, C(i) is the index of lactational infecundity, and TF is the potential total fertility.

The framework's exceptional clarity and organizational power had an enormous impact on the research agenda of fertility studies—particularly for developing countries, but also for historic populations—and the WFS and DHS provided the necessary data to apply the model in a comparative perspective. The significance of the model is partly situated in the structuring of attention and efforts in the search for the ultimate determinants of fertility and fertility change.

Fertility itself is no longer the sole subject of research; in addition we need to look for the institutional and behavioral backgrounds of marriage, contraceptive use, breast-feeding, abstinence practices, and so forth or, to cite Freedman, we are faced with "the challenge of specifying the determinants of the proximate determinants" (Freedman, 1986, p. 30; Hull, 1983; Leridon, 1982). Whereas any such attempt was completely absent in the work of Bongaarts, Davis and Blake in fact used their framework of intermediate variables as a starting point to determine and analyze the institutional factors affecting fertility. Their explanation of fertility rested on the comparative analysis of social organization, which largely boiled down to an explanation in terms of family and kinship organization.

Whereas Bongaarts' model of proximate determinants, as well as the version of Davis and Blake, analyzes fertility at the level of populations and societies, several researchers tried to translate it to the individual level. Hobcraft and Little (1984), for instance, calculate fecundity and fertility as the outcome of the fecundity-reducing effects associated with the particular set of states that describe women's positions in their reproductive career (states related to pregnancy, absence from sexual relations, contraceptive use, postpregnancy infecundity). Becker's model of adolescent fertility (S. Becker, 1993) specifies conditional probabilities of live birth, conception, and coitus on the basis of individual data. Hull (1983) and de Bruijn (1999) explicitly incorporate the proximate determinants in a decision-making approach. The value of this integration is that fertility is not seen as the product of one single decision, but as the possible combined effects of numerous decisions with regard to the—behavioral—proximate determinants such as marriage and divorce, contraceptive use, abortion, frequency and patterns of sexual intercourse, and breast-feeding practices. This reformulation represents a means to increase the relevance of the concept of individual choice for situations under conditions of natural fertility.

Although the popularization of the proximate determinants model is mainly due to its application to developing countries, it is perhaps a mistake to presume that its value may be discarded completely for developed countries (Easterlin and Crimmins, 1985). Although in Western countries fertility is considered to be under volitional control and childbirth to be a matter of demand rather than supply, it is worthwhile recognizing that here too fertility not only depends on behavioral factors, but also on biologic processes. Until recently the main fertility problem was the control of unwanted childbearing and the attainment of a *perfect contraceptive population* (Bumpass and Westoff 1970). In this respect Menken *et al.*, reflected that

> With great effort, fertility has been "turned off": People had come to believe that controlling fertility was the real problem and to expect that having children was easy (Menken *et al.*, 1986, p. 1393).

With respect to the ease of having children, they indicated the growing concern in both the popular and scientific literature with problems related to infecundity and infertility in Western countries, which have become increasingly evident with the generally observed rise in age at birth (see also te Velde, 1992).

Economic Theories of Fertility

The writings of Malthus left their mark in the field of classical and Marxist economics in the 19th and early 20th centuries, and later in the economic analysis of population and development in less-advanced countries, particularly in view of their unprecedented rates of population growth (United Nations, 1973). These macro-economic approaches never became standard material in demographic theorizing, unlike the micro-economic orientations that firmly entered the field in the 1960s.

Harvey Leibenstein (1957) may be called the progenitor of the view that the number of children is the result of individual decision making within an economic context of income and prices. Among others, Nerlove (1974), Willis (1973), Schultz (1981), and, most prominently Gary Becker (G. A. Becker, 1960, 1965, 1976, 1981, 1991; Becker and Lewis, 1973) developed the consumer choice theory into what became known as the new home economics of the Chicago school. This micro-economic approach not only involves the traditional variables of income and prices, but also the *quality of children* and budget constraints in terms of allocation of time and opportunity costs. Given these variables, households are assumed to produce a bundle of consumer commodities—including children—in accordance with the maximization of household utility. The model thereby links fertility decisions to other household decisions, including labor force participation and consumption. The notion of *child quality* became a key factor in Becker's work to account for the inverse relation between income and number of children as experienced in the fertility transition. The quality of children is assumed to be elastic with respect to income, whereas the quantity of children is not. This implies that the desired number of children may fall as income increases because the average cost per child may increase even faster.

The economic approach to fertility has been challenged on several grounds. Part of the criticism can be traced back to the concepts of choice and decision-maker that underlie micro-economic theories: strongly individualistic, decontextualized, static, relying on a narrow, substantive notion of rationality, and without a sufficient degree of (psychological) realism (de Bruijn, 1999). Obviously, representatives of rival disciplines embark upon such general criticism, but it is also voiced by a number of (behavioral and institutional) economists themselves (e.g., Simon, 1987; Lea *et al*., 1987; North, 1994). Among the economists working in the field of demography, Leibenstein and Arthur share some of these concerns. Arthur, in a critical review of Becker's *Treatise of the Family*, "call[s] for the use of rules, rights, agreements, hierarchies, organizational institutions—in short, structure" (Arthur, 1982, p. 395). These remarks touch upon the neglect by most economists of the social, cultural, and political environment of decision making. Leibenstein (1977, 1981, 1982) articulates that the concept of choice as used in economic choice theory is only selectively applicable in the study of reproductive behavior, and much of the fertility outcome must be seen as the result of routine and rule following procedures. With regard to the static nature of the new home economics, it can be observed that by and large economic analysis in demography does not allow for changes in preferences over lifetime as the result of learning and personal experience, and it assumes couples to have defined these preferences at the onset of marriage. Changes in behavior over time are in this perspective considered to be the result of variations in restrictions facing the decision-maker. However, a number of economists provide a more dynamic perspective by applying a life-cycle approach to fertility or accept the possibility of preference shifts (e.g., Moffit, 1984; Namboodiri, 1980, 1983; Rosenzweig and Wolpin, 1980; Siegers, 1987; Turchi 1991).

Although crucial to Becker's interpretation of fertility, the notion of child quality is not free from controversy, both in terms of conceptualization (e.g., Robinson, 1997) and with regard to the assumption that all children born in a family embody the same quality. The last assumption is refuted by the empirical findings that the value of children may differ by parity (Bulatao, 1981; Bulatao and Fawcett, 1981; Namboodiri, 1983) and by sex (e.g., Miller, 1981; Koenig and Foo, 1995; Nag, 1991; UNICEF, 1991). Criticism of the new home economics approach to fertility also refers to the assumption of a single joint household utility function. For one thing, it assumes altruism (with which Becker [1981] tries to deal) and harmony on behalf of both partners, which does not seem very plausible as both power and the distribution of costs and benefits of children may differ substantially between them (Caldwell and Caldwell, 1987; Lee and Bulatao, 1983; Fawcett, 1983; Simmons, 1985). Economic decision-making models are usually completely silent about the bargaining processes that settle possibly conflicting interests with regard to progeny. In several societies, even the absolute authority on fertility decision-making by the parents themselves may be seriously questioned (Khan and Singh, 1987; Koenig and Foo, 1992; Ryder, 1983). Furthermore, the definition of the household concept is notoriously difficult, not only with regard to relevant criteria, but also because of possible shifting and rotating membership of both parents and children. The widespread phenomenon of child fostering, especially in West Africa (e.g., Bledsoe, 1990, 1995; Page 1989), puts the standard economic view on direct and substitution costs of raising children in a different perspective. For these reasons, and because in many instances fertility is not a matter of demand but a matter of supply, the new home economics model is still relatively ill-suited for the analysis of fertility in developing countries (Simmons, 1985).

With regard to the neglect of supply mechanisms in the standard consumer choice theory and its new home economics version, a very important extension is provided by Richard Easterlin and collaborators (Easterlin, 1975, 1978a, 1978b; Easterlin and Crimmins, 1985; Easterlin *et al*., 1980). Easterlin's approach complemented the strictly demand-oriented model of new home economics with notions concerning the production side of fertility as derived from the intermediate variables framework of Davis and Blake and that of Bongaarts and the concept of natural fertility. In this synthesizing effort, he brings together the scientific paradigms of economics and sociology; but this effort clearly should also be considered as an attempt to bridge the gap between fertility analysis in contemporary Western situations and that under non-Western or historic conditions. This *Easterlin synthesis* has gained wide acceptance in demographic research and provided the basis of the agenda of the U.S. National Academy of Sciences (Bulatao and Lee, 1983). The model assumes that all determinants of fertility—public health, education, urbanization, family planning programs, and so forth—work through the categories of the demand for children (depending on household tastes for children and alternative goods, income, and costs and benefits of children), the supply of children (reflecting natural fertility determinants like exposure and frequency of intercourse, postpartum amenorrhea, spontaneous intrauterine mortality, and sterility) and the costs of fertility regulation

(lumping together attitudes toward and access to fertility control methods and supplies, as well as the time and money required to obtain the birth control methods). Motivation to limit fertility only occurs if the supply of children exceeds their demand and the greater the excess of supply over demand, the greater this motivation. But the actual restriction of fertility also depends on the (economic and psychological) costs associated with various birth control methods. A modification in the specification of the demand function compared with the Chicago approach is that Easterlin's model incorporated variable and endogenous preferences, which allowed the explanation of difference in behavior on the basis of opportunities, but also in terms of differences in *tastes*. Furthermore the final dependent variable in Easterlin's model is not children, as much as children surviving to adulthood, thus making not only the supply of children endogenous to the explanatory framework, but child survival as well.

Easterlin contributed another important theoretical proposition to the economic perspective of fertility behavior. This contribution (Easterlin, 1978b, 1980) provided a dynamic element to the analysis of fertility and stands out as the sole fully developed cohort theory in demography. The *Easterlin hypothesis* concerns the adaptivity of fertility preferences (and subsequent fertility behavior) to the realization of a preconceived lifestyle. It asserts that an individual's desired lifestyle is molded by experience during the formative period in adolescence at the parental home. The degree of affluence promised by (male) labor market perspectives during the reproductive period determines the number of children that can be sustained while maintaining the standard of living that was experienced during the formative period. The labor-market or income-earning opportunities, in turn, are assumed to be negatively related to cohort size. This implies that the *tastes* for children or reproductive goals are not given, as assumed in traditional economic theory, but formed during the experience of the income effects caused by the entry of differently sized cohorts on the labor market.

Ní Bhrolcháin (1992) disputes the role of cohort effects in fertility. Although she recognizes the evidence of cohort mortality, which finds convincing foundation in epidemiologic and medical research (e.g., Barker, 1992; see also Caselli, 1990), she is unable to find similar evidence for fertility. Similarly, Wright (1989) has tested the Easterlin hypothesis for 16 European countries but has failed to find a statistically significant correlation between relative cohort size and fertility. From a review of empirical studies, Pampel and Peters (1995) conclude that the evidence for the Easterlin effect proves at best mixed and at worst completely wrong and that the degree of support varies across time periods, nations and level of measurement.

Apart from a number of technical difficulties involved in the measurement of the effect, there are also some conceptual inadequacies. For instance the theory focuses too much on men's roles in the labor market—whereas new home economics emphasizes the role of women—and there is some discussion about whether Easterlin's index of relative cohort size is a good indicator of relative income (Wright, 1989, p. 118). Furthermore, the theory's conceptualization of socialization is rather plain: The influence of personal experience operates from a distant and rather fixed past and neglects the influences of changing social environments apart from cohort size. Exclusive emphasis on the effects of the early socialization experience on a person's aspirations amounts to the neglect of the effect of peer group influences in new environments or experiences in adulthood in general (Freedman, 1987; Namboodiri, 1980). Moreover, there are other lifetime-specific experiences, such as education and labor force participation, which can have decisive impact on (later) considerations in decision making, for instance with regard to goal setting, dependency of others, or the value of children. Lastly, Easterlin's theory needs to specify better the mechanisms through which relative income influences motivation for fertility. Pampel and Peters (1995) suggest that if a number of additional conditions are met, the Easterlin effect still might emerge.

Psychological Approaches to Fertility

Compared with the impact of economics, sociology, anthropology, and biology, the contribution of psychology to demographic theory has been very limited (Burch, 1981; McNicoll, 1992b). The encounter between demography and psychology witnessed the application of two main theoretical approaches: the *value-of-children* approach and applications of psychological value-expectancy models.

The first line of thought can be traced back to a Maslowian perspective on motivation. Taking this as a starting point, Hoffman and Hoffman (1973) constructed a conceptual framework that depicted the way in which children could contribute to satisfying a number of material, social, and intrinsic needs. According to this framework, childbearing motivation depends on the evaluation of these satisfactions and the economic and noneconomic costs of children. The associated perceived value of children appears as an intermediate variable in the explanation of the relation

between socioeconomic, cultural and gender aspects, and fertility behavior. The framework was elaborated and operationalized in the value-*of-children project* in the early and mid 1970s by James Fawcett and others (Fawcett, 1972, 1983; Fawcett and Arnold, 1973; Fawcett *et al*., 1972). Survey data were gathered in different countries, and subsequent analysis compared data for different countries and regions within countries at different levels of socioeconomic development. In this way the model tried to underpin the propositions of the theory of fertility transition, confirming some of them, but remaining undecided on others (Fawcett, 1983; Bulatao, 1982). It did suggest an evolution during socioeconomic development from economic and material considerations with regard to children, to more emotional rewards and psychological appreciation, which induced the introduction of the concept of the *transition in the value of children*. Whereas most applications of the model were carried out within the international comparative framework of the value of children project, several individual studies also relied on it (e.g., Niphuis-Nell, 1981). The value of children approach produced a substantial body of literature especially in the early 1980s, but has not been pursued much since then. Perhaps this is due to the fact that the research has provided relatively few generalizations about how background variables influence the perceptions of satisfactions and costs of children in order to affect fertility preferences and behavior (Fawcett, 1983).

Value-expectancy models like *expectancy x value* and, notably, the Fishbein–Ajzen model of reasoned action (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980) were introduced into demography with regard to the field of fertility, contraceptive use, and female labor market participation (e.g., Bagozzi and Van Loo, 1991; den Bandt, 1982; Fishbein, 1972; Jaccard and Davidson, 1976; Moors *et al*., 1989; Rosenstiel *et al*., 1982; Wijsen, 1994). The Fishbein–Ajzen model states that the intention to perform certain behavior is a reliable indicator of the performance of that behavior. In turn, this intention can be assessed by measuring beliefs with regard to consequences of the behavior and the valuation of these consequences on one hand and perceptions of the opinions of others in combination with the importance attributed to these opinions on the other. An advantage of the model is that it takes into account to a certain extent the influence of the social environment by including a normative component in terms of the opinion of the important others.

To some extent, psychological approaches share the problems associated with micro-economic theories. These concern particularly the volitional character of individual behavior formation and the less than adequate incorporation of the institutional backgrounds determining that behavior. The theoretical framework underlying the value of children framework, and more explicitly the one underlying the psychological value-expectancy models, assumes deliberate choice and purposeful action, which do not always seem to be the most appropriate assumptions given the supply mechanisms of natural fertility, the lack of effective knowledge, the possibility of overriding social pressure in favor of childbearing, and the possibly restricted availability of and access to the means to control it. Ajzen and Fishbein themselves, in fact, recommended their model especially for situations where individuals have strong control over the factors associated with decision making, which is more applicable to developed than to less-developed countries. In this respect, the incorporation of the concept of self-efficacy (Ajzen, 1991; Bagozzi and Van Loo, 1991) may improve the explanatory power of psychological choice models. Other options to increase the relevance of decision making approaches to the situation in developing countries—although at the expense of quantification—relate to a broader definition of the concept of choice: either by extending decision-making analysis to the proximate determinants of fertility or by incorporating the *process* of choice in the sense of processes of attention and (routine and institutionalized) styles of decision making (de Bruijn, 1999; Bulatao, 1984; Shedlin and Hollerbach, 1981; Hull, 1983; Leibenstein, 1982). Such reformulations at least avoid the unjustified distinction between the concept of the person who populates pretransitional societies and who is cast in terms of passive recipients of culture and normative rules and guided by irrational beliefs, and the one who inhabits posttransitional societies and who is viewed as an active, independent decision maker with the capacity for rational thought and behavior (Blake, 1994; Greenhalgh, 1994).

Diffusion of Ideas and Technology

Over the years, the theory of demographic transition has incorporated a number of additional ideas to remedy some of its shortcomings. Many of these efforts were related to the failure to define socioeconomic development as the crucial variable of demographic change. The incorporation of some concept of culture—especially perceived as a principle involved in the spread of ideas—seemed to provide a promising alternative. In its wake, the concept of diffusion entered the theoretical edifice of demography (Cleland and Wilson, 1987; Retherford and Palmore, 1983; Watkins, 1986, 1987), or better, was reinstituted as a major explanatory strand.

Diffusion can be understood as the process by which innovations spread from one locale, social group, or individual to another (Retherford and Palmore, 1983). The spread of ideas, behaviors, and techniques has often been found to follow the grooves laid down by sociocultural forces, such as language, ethnicity, neighborhood, and workplace or channels of communication and exchange. Thus, Lesthaeghe's study of fertility decline in Belgium showed a clear demarcation of fertility patterns and levels along language borders for communities, which were otherwise—socioeconomically—very similar (Lesthaeghe, 1977). Kirk attributes the early transition in countries such as Hungary and Bulgaria to their location along the Danube as a prime artery of communication and commerce (Kirk, 1996). Various others point to migration avenues, network channels, and institutionalized lines of communication for the spread and explanation of family planning acceptance (e.g., Bongaarts and Watkins, 1996; Freedman, 1987; Cleland, 1987; Watkins, 1987, 1989). Entwisle *et al.* found evidence of the importance of conversational networks to directing and controlling the flow of information about contraceptive methods in rural communities in Thailand (Entwisle *et al.*, 1996). They associated the variety of method acceptance between communities and the typical predominance of one method within the communities with the structure of largely village-based social networks. The notion of diffusion also focuses attention on the different contextual levels—interpersonal, local, national, and global—involved in the transmission of information (Bongaarts and Watkins, 1996; Hammel, 1990; Montgomery and Casterline, 1996; Retherford and Palmore, 1983).

The reception of diffusion into fertility theorizing brings along its own conceptual and methodologic problems. With respect to diffusion, Greenhalgh cautions against a too reductionistic approach focusing almost entirely on communication about birth control, while neglecting the exchange of a broad scale of perceptions on other issues relevant for reproductive behavior (Greenhalgh, 1995b). To parts of the family planning movement the contribution of diffusion was even restricted to the spread of contraceptive technology (e.g., Ravenholt and Chao, 1974). Pollak and Watkins (1993), like Greenhalgh, argue that diffusion involves more than techniques and mere information. They refer to van de Walle who states that in early 19th century condoms were licit in extramarital liaisons, but not within marriage, and to Bledsoe who reaches a similar conclusion for several African countries. This pertains to the critique that the diffusion approach is problematic in its omission of the context of contraceptive communication, especially with respect to the requirement of its social legitimation and the spread of values (Lesthaeghe and Wilson, 1986; Handwerker, 1986). Related to this critique, many consider the diffusion concept merely a description without notable theoretical content (McNicoll, 1992; Pollak and Watkins, 1993); sometimes it entails just summary statistics that reflect the pattern of spatial and temporal spread of some phenomenon. Hammel's (1990) contribution can be mentioned as an important step to provide more substance to the notion of diffusion, but within demography, of course, Rogers (1962/1983, 1973) must also be referred to, with the work of Montgomery and Casterline (1996), who try to model the social structure of contraceptive diffusion. Still, a fundamental underpinning of the working of the diffusion mechanism—how information is conveyed in the social environment and how the messages are organized and interpreted, and finally lead to behavior—is in the lap of other disciplines such as (cognitive) anthropology, sociology, and, importantly, social learning theory (de Bruijn, 1999).

Culture, Structure, and Social Organization

The field of fertility theory covers a large number of interpretations and approaches that are not neatly classifiable as a disciplinary theory. In contrast to, for instance, economic, psychological, and proximate determinants approaches to fertility, they do not have an internally agreed set of variables, concepts, and theoretical propositions nor a strict methodology. Their common feature is the focus on the structural level of society, culture, institutions, or social organization—and often in combination—but otherwise it is a very heterogeneous compilation, its backgrounds largely in the more holistic disciplines of sociology and anthropology. They may involve aspects from theoretical approaches mentioned above, and many of them, in fact, can be interpreted as enrichments or modifications of the theory of demographic transition. Far from claiming to be exhaustive, a list of such approaches to fertility might include system–functionalist ideas derived from Adam Smith's *invisible hand* hypothesis (Wrigly, 1978) and other homeostatic interpretations (Howell, 1979, 1986; Kreager, 1982, 1986; Lesthaeghe 1980), *modes-of-production* paradigms (Boserup, 1970, 1990; Goody, 1976), Lesthaeghe's production–reproduction thesis (Lesthaeghe and Surkyn, 1988b; Lesthaeghe, 1989b), Cain's institutional approach of risk and insurance (1981), Caldwell's wealth flows theory (Caldwell, 1976, 1982), family-oriented analyses (Ariès, 1962; Cain, 1989; Freedman, 1975, 1987; Davis and Blake, 1956; Khan, 1987; Ryder, 1983), the notion

of the second demographic transition (Lesthaeghe and van de Kaa, 1986; Lesthaeghe and Verleye, 1992; van de Kaa, 1987) and the recently emerging institutional approaches in the line of Greenhalgh (1988, 1990, 1994, 1995a) and McNicoll (1980, 1985, 1988, 1994).

In disappointment at failing to find the crucial determinants of fertility in socioeconomic indicators, some demographers have turned to culture (Cleland and Wilson, 1987). Research based on the results of the WFS (e.g., Cleland, 1985) and the Princeton study on the European transition experience (Anderson, 1986; Knodel and van de Walle, 1979; Watkins, 1986) signified the importance of cultural factors as the major independent determinants of fertility levels and the onset of fertility decline. These studies, however, did not elaborate on what was exactly meant by *culture*. Greenhalgh (1994) and Hammel (1990), therefore, accuse demographers of a widespread incompetence to conceptualize culture meaningfully. Apart from the work of a small number of researchers, culture has hardly gained any depth; it is usually only grasped in terms of language, ethnicity, or geographic region. Large-scale surveys on which traditional demographic research is based cannot grasp the meaning of culture, and so to many demographers, the concept connotes a *messy bag* (Lesthaeghe, 1989a), which may be assumed to contain all residual explanation. The problem of incorporating culture into theory, however, is not restricted to demographers alone: All social sciences consider culture a notoriously difficult concept, perhaps even more than the concept of social structure (Archer, 1996).

Culture is usually claimed to stand for the shared and intergenerationally transmitted beliefs and evaluations about the world and people's place in it. The role of culture in fertility change is presumed to be particularly located in this feature of transferring values and information within a culturally identifiable group (e.g., Lesthaeghe, 1977). But apart from this communicative feature, culture provides the normative and interpretive or meaning-giving rules with which people consider fertility and its proximate and ultimate determinants. The link between culture as an ideational or meanings system and social organization lies in the common order it provides for the definitions of social relationships and evaluation of individual behavior. Modes of production, intergenerational and gender relations, marriage systems, and so forth are reflected in culture. However, by providing social structure with a meaning, culture also legitimizes and, therefore, (re)produces society. This dualist manifestation has been acknowledged in demographic literature by several exponents of a cultural approach to fertility theory (e.g., Greenhalgh, 1989; Hammel, 1990; Lesthaeghe and Surkyn, 1988a). In the social, political, and anthropologic analysis of fertility, the family is the dominant institution: It is the locus of demand and supply of children, by and large it retains the function of socialization base, and often it constitutes the prime avenue to achieve things that are important in life, such as economic assistance, security, social interaction and status, information, and emotional and political support (Davis and Blake, 1956; Dyson and Moore, 1983; Freedman, 1987; McNicoll 1994).

Several broad lines of thought on the rather elusive concepts of culture and social structure can be distinguished in demography. Most of them are not acknowledged as separate theories, so the discussion here is arranged around the work of the major proponents and publications.

A first mode of thought with social structure as its point of departure is the holistic representation of society as an integrated system of arrangements and mechanisms that are principally geared to the reproduction and maintenance of that system. It can be viewed as a continuation of the Malthusian program, but based on modern research and insights. A milestone publication in this respect is Coleman and Schofield's *The State of Population Theory*. Kreager's work (1982, 1986) may be representative for this approach when he paints an anthropologic vision of demographic regimes as Durkheimian organic solidarities. Population process components—fertility, nuptiality, migration, and mortality—work in a coordinated fashion so as to adjust population size and distribution to the capacities of the environment.

Such studies concentrate on the colorful anthropologic uniqueness of societies, but sometimes tend to over-emphasize the cultural barriers to demographic change (Robinson, 1992; Lockwood, 1995). By their nature they are not infrequently rather static and descriptive, and fail to provide the links of encountered feedback mechanisms to the motivation of individuals to act in line with the long-run societal benefit. Lesthaeghe, for instance, rightly points out that there is no need to assume a latent aim of controlling population growth if other explanations, centering on direct goals, like survival of children or maintaining power relationships, are available to account for it (Lesthaeghe, 1980). On the macrolevel such individual pursuits of goals—importantly shaped by the structure and content of the social environment—may have the effect of maintaining a functional demographic balance in the long run (Blake, 1994).

Explaining demographic patterns only in terms of system needs easily ends in *ad hoc* or tautologic theorizing. The demonstration of the functional quality of certain collective behavior to a population system

cannot demonstrate its necessity to be there, at that time and in exactly that form; there may very well be other, functionally equivalent, behavior patterns that could respond to the same motives (McNicoll, 1992; North, 1994). It is easy to interpret some institutional arrangement as valuable if it has found its established place in some situation, but the danger of ex post rationalization is acute: Conceivably under a different arrangement the situation would have been served even better. This reflection led Demeny to his gloomy remark that "the impression is overwhelming that history is a story of unrealised [sic] potentials that could have been within our grasp" (Demeny, 1986, p. 483).

The only line of thought that may claim the status of *demographic theory* and is as yet the only one that can conceptually rival the conventional transition theory (particularly in the setting of contemporary less-developed countries), is Caldwell's wealth flows theory (1976, 1982). Culture, here, is importantly represented by the meaning of kinship and family, traditionally a central issue in the anthropology tradition from which Caldwell originates. The theory states that the level of fertility is primarily imposed by the direction of the net wealth flows between parents and children, which include all the present and anticipated benefits over a lifetime. The outcome of this economic rationale is either maximum or zero fertility, but this is adjusted by the impact of personal, social, and physiological reasons. The commanding principle underlying the direction of intergenerational wealth flows is the social organization of the society, and specifically family structures. Caldwell argues that in all traditional societies the net wealth flow has been from younger to older generations, which means that economic motives promote high fertility. This flow will only be reversed if the economic and emotional primacy is withdrawn from the grip of broader family ties and is focused on the conjugal family. The nucleated family is, therefore, a *sine qua non* for low fertility and the transition from high to low fertility is a product of social change with economic implications, rather than economic change alone.

The primary force behind the transformation of the family is credited to universal education across a nation or cultural group. Mass education changes the values and costs of children within the family and introduces a Western family model into the society. Capitalizing on the general failure to identify critical socioeconomic variables for the onset of fertility decline, Caldwell argues that it is the process of Westernization, rather than economic modernization, which initiates the change toward low fertility (Ryder, 1983). Put to the test (e.g., Dow *et al*., 1994), Caldwell's theory received less support than might have been expected on conceptual grounds. It is not clear to what extent this is due to the severe operationalization and measurement problems—for instance the measurement of wealth flows—that are inherent in the theory's formulation (Schultz, 1983).

A third line of thought, like Caldwell's intergenerational perspective, involves the institution of the family, but with a different nuance. Here, family is primarily the outcome of large-scale historic socioeconomic and cultural processes, rather than the exclusive focus of demographic change. This tradition is most prominently recognized in the work by Lesthaeghe. The gist of his work is best articulated by the attention to the analysis of the first two of Coale's prerequisites for a fertility transition: First that the very deliberation about pros and cons of additional children to the family must be an acceptable form of behavior, and second that perceived social and economic circumstances must make reduced fertility seem an advantage to individual couples (Coale 1973, p. 65). Both preconditions are clearly anchored in the context of ideational systems and social organization, which is formulated by Stamm and Tsui as follows:

> The impact of family-planning technologies on reproductive parameters is a function of the systems of meaning which underlie the reproductive choices and preferences of the individuals comprising a society. Such systems of meaning define both what is and what is not subject to choice and the value of choice options (Stamm and Tsui, 1986, p. 159).

To arrive at reduced levels of fertility, there must be a favorable meaning-giving or ideational environment to direct the preferences and considerations that authorize the legitimacy of individual control over fertility as well as the desirability of smaller family sizes (Lesthaeghe and Wilson, 1986). Falling back on Maslow's notion that, along with development, intrinsic personal needs will become increasingly important, a universal emancipatory tendency of individualization may be assumed to have its effects on fertility behavior (Lesthaeghe, 1983; Lesthaeghe and Surkyn, 1988a). This may lead to a decline in fertility, but only if existing institutions that exert a pronatalist influence lose the legitimacy of their grip on individual decision making, and if socioeconomic conditions are such that the balance of subjective cost-benefit considerations is tipped toward smaller families. Although the complex associations between socioeconomic development and ideational change are explicitly discussed (e.g., Lesthaeghe,1989b; Lesthaeghe and Wilson, 1986), Lesthaeghe stresses the importance of autonomous ideational shifts toward liberal and, especially, secular values. In this respect Lesthaeghe's ideation with

social–organization approach is a major modification of the classical notion of demographic transition.

This general scheme has been applied to the situation in sub-Saharan Africa (Lesthaeghe, 1989a, 1989b; Lesthaeghe and Eelensm 1989; Lesthaeghe and Surkyn, 1988b), to historic Western Europe (Lesthaeghe, 1983; Lesthaeghe and Wilson, 1986), and to recent demographic change in Western Europe (Lesthaeghe and Moors, 1992; Lesthaeghe and Surkyn, 1988a), cumulating in the concept of the *second demographic transition* (Lesthaeghe and van de Kaa, 1986; van de Kaa, 1987; Lesthaeghe and Verleye, 1992). Each time, the picture is painted differently, highlighting the specific relevant elements of the historic and institutional background. During Europe's fertility transition this included the nuclear family dominance, the evolution of a capitalistic mode of production, the waning of religious doctrines as guiding principles and general economic growth, fueling individual aspirations (Lesthaeghe, 1983; Lesthaeghe and Wilson, 1986). The second demographic transition can be distinguished primarily on the basis of a marked acceleration of the trend toward self-fulfillment and individual autonomy, bringing about new types of demographic behavior in the sense of new living arrangements and changed timing and prevalence of marriage and childbirth (Lesthaeghe and Verlye, 1992; van de Kaa, 1987). With regard to sub-Saharan Africa, the designation of social organizing principles relies heavily on the intellectual legacy of Boserup (1970) and Goody (1976) with respect to the structuring impact of modes of production on patterns of nuptiality, gender relationships, and progeny; but it also relies on classifications in terms of religious background (especially Islamization and the survival of traditional religions), female education and contraceptive use. The emerging picture reveals the complexity of the effects of interactions between socioeconomic development and social institutions on patterns of starting, spacing, and stopping childbearing (Lesthaeghe and Eelens, 1989).

A promising new line of interpretation is the institutional analysis of fertility. This approach, again, may be viewed as a reaction to the theory of demographic transition. Whereas the classic transition theory searched for general processes (including, at least in its original formulation by Notestein, the role of social institutions) and focused on macrolevel and socioeconomic aspects, the new institutional approach seeks situational and path-dependent specificity, and is sensitive to cultural interpretations and the interaction between structure and agency. The research and analyses of Lesthaeghe and Caldwell clearly largely fall into this interpretive framework. Well-known is also Cain's (1981, 1989) analysis of the value of children as a source of risk insurance in villages in India and Bangladesh, which suggests that the differences between the settings can be largely attributed to institutional elements like labor division between the sexes, patriarchy, legal status, and social security systems. The leading demographers in the field, however, are Susan Greenhalgh and Geoffrey McNicoll. Although Greenhalgh starts out from a political-anthropologic perspective and McNicoll particularly relies on a sociologic and institutional economics background, they are remarkably in unison in voicing the needs for and elaboration of institutional analysis.

Both largely reject the possibility of general schemes of fertility change. Compare, for instance, McNicoll's statement that:

> [F]rom a distance, the process of fertility transition that accompanies social and economic development shows many similarities across major world regions [. . .]. Yet at closer range fertility transitions are idiosyncratic. Their course is influenced by the institutional endowments each society has inherited through its particular historical experience (McNicoll, 1994, p. 2)

with that of Greenhalgh:

> There is no single demographic transition, caused by forces common to all places and all times. Rather, there are many demographic transitions, each driven by a combination of forces that are, to some unknown extent, institutionally, culturally, and temporally specific (Greenhalgh, 1990, p. 88).

A seminal article that contributed much to the attention for the institutional background of fertility and on the micro–macro link of fertility explanation was conceived by McNicoll (1980). Relying on Herbert Simon's concept of bounded rationality, he argued that the options for fertility behavior that are salient to the individual consist of only a selection of all options and that this salience depends on the structure of the information environment that is shaped by social institutions. In McNicoll's perspective, social institutions may be interpreted as the socially constructed (and sanctioned) rules that provide solutions to recurrent problems of individual action and interaction (McNicoll, 1985). This normative character of institutional rules may be complemented with their representational or meaning–giving dimension, which fits better with Greenhalgh's cultural interpretation. Both McNicoll (1994) and Greenhalgh (1995b) view institutions as social constructs that are constantly being made, remade and possibly dismissed in processes of negotiation and individual action. Although neither of them elaborate much on this issue, it may provide a tangible opening toward psychological and economic choice considerations, and thus a unique opportunity to narrow the gap between macro and micro approaches, structure and agency, and context and choice (de Bruijn, 1999).

The identification of interpenetrating local, regional and national institutions reflect the multi-level nature of context. Greenhalgh (1990, 1995) even goes on to the international arena, extending Watkins's remark that in 1870, the relevant community to which behavior pertained was largely local whereas in 1960 it was largely national (Watkins, 1989). Thus, aims of the international community with regard to women's rights and reproductive health as voiced at the 1994 Cairo Conference on Population and Development can be effectuated by supportive legislation at state level and women's organizations at lower levels, but can also be impeded by adverse family and gender systems or local labor market opportunities. Overarching institutions like religion or national family planning programs may be negotiated differently in a rural farming community than in the neighboring fishing community, because of the differences in the local economies (Niehof, 1985). Due to the sustained conjuncture of various institutions in specific social settings, the meaning of the individual institutions may change in the course of time, which is why, for instance Catholicism in Ireland has become different from that in Mexico or Sri Lanka (Handwerker, 1986). An institutional approach finds the understanding of fertility at least partly in the historic evolution of the specific amalgam of institutions: It views them as evolving processes that not only depend on current circumstances, but also, and crucially, on their past history, and, which moreover, evolve at every point in time, rather than only during a transition phase (Greenhalgh, 1995; McNicoll, 1994).

Most of the structural-cultural approaches may be understood as a reaction to the theory of demographic transition as a leading paradigm in demography. This reaction takes shape in various ways, from a reformulation of the central concepts of a transition (Caldwell), via a further specification of particular conditions under which transition is likely to occur (Lesthaeghe), to an outright rejection of a common force of fertility change (Greenhalgh), and further to the adoption of a situational analysis of the specific combination of relevant institutional forms (McNicoll). The theoretical profundity of the study of fertility declines essentially in the same order. Caldwell's approach is a straightforward theory, McNicoll's yields an analytic framework and, hopefully, a methodology or research agenda (McNicoll 1985, 1992).

CONCLUSION

The theoretical orientations presented here provide distinctive angles to view one and the same object of study. The consequence is a corresponding range of different answers to principal questions and requirements with respect to theory building and methodology. On its own, each theoretical approach does not provide a complete picture, but each advances its own propositions that contribute to understanding of fertility behavior. To a large degree, their differences are not complementary, but reflect different interests and assumptions, differences that might be irreducible unless human science in general succeeds in developing an encompassing meta-theory.

Given the state of fertility theory, how is it likely to evolve in the near future? This will depend on a number of factors, such as developments in other disciplines, newly emerging issues—childbearing at advanced ages, new fertilization technologies—and demands with respect to forecasting, policy development, and contributions to intervention programs. With respect to the latter, demographers have long been called upon to contribute their views, but have seemed to lack the appropriate conceptual competence to do so effectively. The demographic transition theory, and in a further distance Malthusian notions, provide a general background for family planning, but have not yet yielded the insight into individual behavior formation nor the specific knowledge about the context of that behavior that is necessary for the design of effective intervention programs. With regard to the interpretation of individual behavior, more contributions might have been expected from psychology, but psychological demography has largely stuck with the value-of-children approach and the 1970s based versions of choice models. It might be useful to consider recent developments in the area of cognitive psychology, and especially learning theory, for instance with regard to information education and communication activities, and, in general, the diffusion of knowledge and ideas. With respect to the situational analysis, demography has made prominent advances. The recently emerged institutional approaches offer good scope to provide an adequate representation of the social, economic, cultural, and political dimensions of the situation-specific context of fertility. Given advances in cognitive anthropology, sociology, and institutional economics, further elaboration and maturation of this field can be anticipated.

Finally, most theoretical approaches to fertility lack a dynamic perspective. Again, institutional analysis, relying on its historic and path-dependent interpretation, might improve this situation with respect to the social context of fertility. At the level of individual time, further development in the area of life course analysis is likely to occur. Although there is substantive literature in this respect (e.g., Birg *et al*., 1991;

Coleman, 1983; Courgeau and Lelièvre, 1989; Willekens, 1991), it has not yet entered mainstream theoretical thinking in demography.

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