1-1-1987

A biosocial perspective on paternal care and involvement

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Recommended Citation

pp111-142 in Parenting Across the Lifespan:Biosocial Perspectives, eds :Lancaster,Altmann,Rossi & Sherrod,

Whitehead, R.G., Hutton, M., Mueller, E., Rowland, M.G.M., Prentice A.M., and Paul, A. Factors influencing lactation performance in rural Gambian mothers. *Lancet*, 1978, *2*, 178–181.

Wiener, S.G., Fitzpatrick, K.M., Levin, R., Smotherman, W.P., and S. Levine. Alterations in the maternal behavior of rats rearing malnourished offspring. *Developmental Psychobiology*, 1977, *10*, 243–254.

Wilen, R., and Naftolin, F. Pubertal food intake and body length, weight, and composition in the feed-restricted female rat: Comparison with well fed animals. *Pediatric Research*, 1978, *12*, 263–267.

Wilson, M.E., Walker, M.L., and Gordon, T.P. Consequences of first pregnancy in rhesus monkeys. *American Journal of Physiological Anthropology*, 1983, *61*, 103–110.

Williams, G.C. Pleiotropy, natural selection and the evolution of senescence. *Evolution*, 1957, *11*, 398–411.

Woodside, B., Pelchat, R., and Leon, M. Acute elevation of the heat load of mother rats curtails maternal nest bouts. *Journal of Comparative Physiology and Psychology*, 1980, *94*, 61–68.

Yagil, R., and Etzion, Z. The effect of drought conditions on the quality of camel's milk. *Journal of Dairy Science*, 1980, *47*, 159–163. (a)

Yagil, R., and Etzion, Z. Milk yield of camels (*Camelus dromedarius*) in drought areas. *Comparative Biochemistry and Physiology*, 1980, *67A*, 107–209. (b)

Yagil, R., Etzion, Z., and Berlyne, G.M. Changes in rat milk quantity and quality due to variations in litter size and high ambient temperature. *Laboratory Animal Science*, 1976, *26*, 33–37.

Yahr, P., and Kessler, S. Suppression of reproduction in water-deprived Mongolian gerbils (*Meriones unguiculatus*). *Biology of Reproduction*, 1975, *12*, 249–254.

Zarrow, M.X., Denenberg, V.H., and Anderson, C.O. Rabbit: Frequency of suckling in the pup. *Science*, 1965, *150*, 1835–1836.

Zucker, I., Johnston, P.G., and Frost, D. Comparative, physiological and biochronometric analysis of rodent seasonal reproductive cycles. *Progress in Reproductive Biology*, 1980, *5*, 102–133.

5 A BIOSOCIAL PERSPECTIVE ON PATERNAL BEHAVIOR AND INVOLVEMENT

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INTRODUCTION

Our goal in this chapter is to review selectively our current knowledge of fathering and father–child relationships in humans. Fathering (like mothering) includes a diverse array of activities involved in conceiving, feeding, provisioning, protecting, and rearing one's offspring. Psychologists have traditionally focused on the direct rearing activities and their correlates, so discussion of these issues constitutes the bulk of this chapter. Because the empirical literature is sparse and the constructs are ill-defined, we are able to say much less about the two other aspects of fathering. We discuss fathering as insemination and as protection and provisioning. For the most part, the literature we review pertains to the behavior of men in contemporary, Western, industrialized contexts. Similar questions might be asked about the behavior of men in other cultural contexts or about the behavior of fathers in other species. Our decision to focus on Western fathers rests on the need to limit the scope of the chapter in some way and to persuade social scientists that a biobehavioral approach is relevant, not only to the understanding of behavior in other species or more "primitive" societies, but to the behavior of humans in modern industrialized contexts as well.

Research on fathering and father–child relationships in Western societies has burgeoned recently, and it is thus necessary to limit our focus. We have chosen to concentrate on evidence concerning what fathers actually do *to beget* children, *for* their children (e.g., breadwinning), and *with* their children. In essence, it focuses on how much and what fathers do with and for their children, how well they perform as parents, what factors affect paternal involvement, and male procreative strategies.

Clearly, the recent increase in concern about father–child relationships is attributable in part to changing assumptions about the roles of men and women and to a resurgent belief that fathers can have a substantial influence

on their children's development, both by way of their direct effect on children and by way of their influence on mothers, who in turn affect children (Belsky, 1981; Parke, Power, & Gottman, 1979). Lamb (1981b) reviews the literature suggesting that nurturant and at least somewhat involved fathers, as well as fathers who are emotionally and materially supportive of their wives, tend to facilitate the development of achievement motivation, cognitive and social competence, psychological adjustment, and sex-stereotyped role attitudes and attributions, particularly in sons. Continuing societal uncertainty and ambivalence about the roles of women seem to ensure that nurturant involvement can have a variety of effects on daughters, depending on the father's values and expectations. Unfortunately, the extensive literature on paternal effects cannot be explored here.

In our attempt to explain the data, we introduce a set of concepts drawn from behavioral ecology (e.g., Krebs & Davies, 1981). The exercise is largely heuristic, and illustrates our belief in the need for coherent theoretical approaches in this area. Whether or not it is subsequently shown to have explanatory power, behavioral ecology at least permits us to articulate testable hypotheses that invoke concepts applicable to the understanding of human behavior more generally, and that systematically address multiple levels of explanation and analysis. Unfortunately, it is clear that research in the behavioral sciences seldom addresses the issues of primary relevance to the questions raised by behavioral ecology; indeed, one has to wonder whether the constructs popular among sociologists and psychologists are the most useful when it comes to explaining even the immediate (i.e., proximate) determinants of human behavior. As will be apparent, there is a clear need for articulate theory construction in this area. We hope that behavioral ecology will help researchers define the questions, at multiple levels of analysis, that guide future research endeavors.

The issues and concepts basic to behavioral ecology are briefly discussed in the first section as a means of framing the analysis that follows. We then turn to male procreative strategies and provisioning/breadwinning, as they bear on the understanding of fathering in modern humans. In the third section evidence concerning the competence displayed by fathers is considered: compared with mothers, just how good are they as parents and as caretakers? The analysis of similarities and differences between mothers and fathers in parental competence leads to consideration in the fourth section of sex differences in the behavioral styles of mothers and fathers interacting with their children. In both sections, proximate (that is, immediate physiological and social/experiential determinants) and ultimate (that is, those related to biological function and evolutionary history) interpretations of the sex differences observed are discussed. In the fifth section studies designed to determine how much time fathers spend with their children, and how this compares with the extent of involvement by mothers, are considered. The focus then shifts to factors affecting degree of paternal involvement,

beginning with factors accounting for sex differences between men and women and proceeding to factors accounting for individual differences among men.

FACTORS AFFECTING SEX DIFFERENCES IN PARENTAL BEHAVIOR

As in most of the great debates in psychology, popular and scientific discussions of sex differences in parental behavior frequently degenerate into debates between simplistic environmental determinism and simplistic biological determinism, neither of which proves very helpful in understanding the phenomenon. As indicated below, it seems that both biological and environmental factors are important, and that it is of little value to juxtapose these as competing rather than complementary positions.

Part of the problem lies in the multiple interpretations of the word "biology." This term is often used—incorrectly—to refer only to hard-wired deterministic influences on behavior, whereas it is more appropriately used to refer to *the tendencies on the part of organisms to make "decisions" based on behavioral predispositions and general goals* (i.e., maximizing inclusive fitness: Hamilton, 1964) *manifest or pursued in the context of, and dependent upon, the restrictions imposed or options made available by the social and physical ecology* (Krebs & Davies, 1981). In the discussion that follows, the term "physiology"[1] describes proposed hard-wired dispositions, whereas the term biology is used in its broader, more inclusive, sense. The environmental factors frequently viewed as alternative explanations of sex differences in parental behavior may better be viewed as characteristics of the relevant ecology within which mothers and fathers make choices based on their behavioral predispositions, general goals, and ontogenetic experiences. The environment, in other words, must be seen as one of the important factors involved in unraveling the biology of behavior.

As Tinbergen (1963) pointed out many years ago, any attempt to explain *why* individuals behave in a certain way involves addressing any or all of four equally legitimate types of "why" questions: ultimate *function* (survival and reproductive value), *causation* (internal and external proximate factors), ontogenetic *development*, and *evolutionary history*. Psychologists—even those who claim a concern with biological factors—have emphasized proximate causation and development; perhaps more attention to ultimate function and evolutionary history would expand and broaden our understanding. A preliminary attempt is made to explore these broader issues in this chapter.

[1]Clearly the term physiology is not used appropriately here, and hence inverted commas are used throughout the chapter. We are not aware of any term that appropriately represents the hard-wired view of "biology."

In efforts to explain the differential parental involvement of mothers and fathers, the more extreme biogenetically deterministic positions tend to focus on either ultimate (i.e., evolutionary) arguments or more proximate (i.e., hormonal) factors. In reality, of course, these two sets of factors are not incompatible, as they involve reference to different levels of explanation (different questions in Tinbergen's framework).

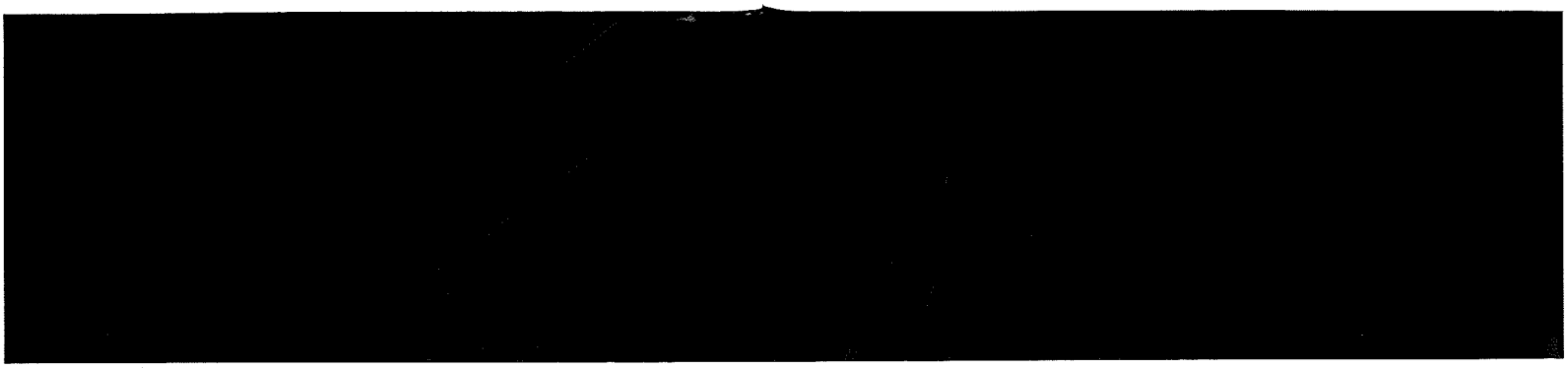
Let us first consider ultimate factors. Sociobiologists, stressing the principles of natural selection, point out that the goal of any individual organism is to maximize the representation of *its* genes in future generations (Krebs & Davies, 1981; Williams, 1966; Hamilton, 1964). This involves not only high levels of fertilization but also the rearing to reproductive maturity of one's offspring, taking into account the costs and benefits of the various activities that affect inclusive fitness. In many species, furthermore, there is a sex difference in the costs of child rearing and childbearing (Trivers, 1972). Among mammals, for example, females must invest considerable time and effort in the intrauterine maintenance, delivery, and postnatal care of youngsters who are, at least initially, wholly dependent on pregnant and later lactating mothers for survival. During this period, males are often free to mate with other females without affecting the likelihood of survival by their existing offspring, because previous female mates have so much invested in each litter (or child) that it would not be in the mothers' interests to abandon them and thus reduce their own inclusive fitness. The female role in reproduction thus makes it desirable for mammalian females to remain involved in the care of the young. Because males can count on females (who have more at stake) to care for their offspring, adult males can choose to maximize fitness through multiple matings rather than parental investment. On the basis of evolutionary principles and consideration of male and female roles in mammalian reproduction, therefore, one might expect sex differences in human parental involvement, with women being more involved in child care than men are.

The proximate (hormonal) argument, by contrast, proposes that women, who are hormonally prepared for pregnancy, parturition, and lactation, are primed similarly for the nurturant child-care tasks that are also essential for the survival of offspring. Men, who do not "need" to participate in child care, would not have these capacities. Thus, women would be biologically prepared for involvement in parenting while men would not be. This line of reasoning focuses on proximate rather than ultimate explanations, and could thus complement the sociobiological position just described, suggesting one of the possible physiological mechanisms whereby sex differences in parental involvement are achieved.

These arguments are plausible as far as they go. There probably are biogenetically determined sex differences in behavioral propensities. However, there is no reason to believe that these propensities are deterministic, mandating female involvement in parenting and precluding male involvement. It is probable that they make females more likely to seek out or encounter opportunities to learn child-care skills, and perhaps able to learn these skills more rapidly than boys (for analogous points, see Hamburg & Goodall, 1974; Rosenblatt, 1970). As demonstrated below, men can perform parenting tasks just as well as women can, and it is clear that they have become more involved in the last few decades (Pleck, 1983, 1984). This testifies to the plasticity of the "biological" (i.e., physiological) program and undercuts simplistic notions of biological determinism while being in no way incompatible with the principles of evolutionary biology as we now understand them.

A key tenet of sociobiology or behavioral ecology is that individuals are designed to maximize their fitness *in the context of the options available to them* given the physical, economic, and social ecology. The goal is individual inclusive fitness, not propagation of the family, group, or species. Behavior is only optimal (in terms of fitness) in the context of a specific environment (broadly defined), and thus it is necessary to consider the constraints or facilitators of behavior represented by the social and physical environment. Among the important, all interrelated, factors to be considered are: the number of young born simultaneously; their size and nutritional needs relative to those of adults; the interbirth interval; the species' mode of feeding (ranging from omnivorous to extreme selectivity); the nutritional richness of the ecology; and the species' typical social organization, particularly as it affects the options for reproduction and male certainty regarding paternity. In species like pygmy marmosets (*Callithrix jacchus*), for example, females, typically give birth to twins who are quite large relative to adults. It is physically impossible for females to feed these twins and themselves without assistance, so males assume the majority of child-care responsibilities, carrying the young at all times other than when they are nursing (e.g., Ingram, 1975). Freed of the burdens of carrying her offspring, the mother is able to nurse the twins, feed herself, and (as an added bonus to her and the loyal male) become pregnant again very rapidly. In this case, therefore, the reproductive fitness of females *and* males is enhanced by high paternal involvement. We also need to remember that within-species variability may often be desirable. For example, if most males adopt strategy A, it may be advantageous for some others to adopt strategy B. The system is in equilibrium when the fitness gains of pursuing strategy A are equal to those gained by pursuing strategy B.

The fact that these factors (among others) affect paternal involvement across species is important, because it undercuts simplistic, deterministic notions concerning the biogenetic constraints on parental (and especially paternal) behavior. Clearly, a biological perspective compels us to consider not only the physiological predispositions and potentiations, but also the ecological factors defining the environment in which the potential is displayed, whether that resembles the one for which it may have evolved or whether it is in many ways an evolutionarily novel context.



PROCREATION AND PROVISIONING

Procreation

Procreation must surely rank as one of the major activities involved in the attainment of inclusive fitness; it constitutes one of the most basic elements of fatherhood. American psychologists, however, have almost totally ignored this aspect of fatherhood, and the discussions by anthropologists and sociobiologists seldom go much beyond the issues raised in the previous section (cf., Symons, 1979; Van den Berghe, 1978, 1979). Some insight into the psychological significance of procreation in industralized countries can be obtained by examining research on the effects of infertility, however. Upon recognition of their infertility, many men experience prolonged impotence and depression (Berger, 1980), with a sequence of reactions that often resembles the reactions to diagnosis of cancer (Wilson, 1979). Interestingly, the reactions of men to voluntary sterilization by vasectomy do not appear to be so negative; indeed, some researchers report mainly positive reactions (Ager, Werley, Allen, Shea, and Lewis, 1974; Ferber, Tietze, & Lewit, 1967) while others report modest effects on psychological adjustment and self-concept (Horenstein & Houston, 1975; Bloom & Houston, 1976; Cord, 1972; Kendall, 1972). In the United States cultural attitudes toward vasectomy remain somewhat disapproving (Rodgers, Ziegler, & Levy, 1967).

According to sociobiologists (e.g., Trivers, 1972), reproduction almost certainly requires that males and females adopt different strategies in order to maximize their reproductive success. As mentioned earlier, females produce relatively few large gametes while males produce an essentially unlimited number of small gametes. Female mammals initially provide intraorganismic sustenance for their offspring, and during this time they are unable to conceive. Typically, there also follows a postnatal period of variable length during which maternal lactation is essential for survival. For all these reasons, the absolute number of offspring that any female can conceive is limited. During the lengthy pre- and postnatal period, by contrast, males are (in principle) free to mate without jeopardizing the survival of any existing conceptus. Because the female has so much invested in the young (by virtue of her pre- and postnatal involvement) and because the opportunity cost is so high, the male can count on her to look after their offspring.

This suggests that promiscuity should often be the reproductive strategy pursued by men. However, there are six major complicating factors. Most importantly, there is always some male uncertainty regarding paternity while there is certainty regarding maternity. By restricting access to females, particularly during fertile periods, males can increase the likelihood that the offspring conceived are their own progeny, but by so doing males reduce their potential for pursuing alternative females.

Second, in some mammalian species, probably including most early and contemporary hominids, pregnant and lactating mothers are partially dependent on others for provisioning and protection. The individuals most likely to provide these resources are those who have something at stake themselves, and the offsprings' fathers clearly have most at stake. To the extent that such provisioning and protection is desirable for females, it is advantageous for them to persuade males that they are the offsprings' fathers, and it is advantageous for males to have some reason for believing this. In this context, both sexes benefit if the males remain with the females.

Third, sexual encounters typically depend on both male and female participation. If females limit their sexual contacts, they may demand compensation from males—most likely in the form of protection and provisioning, particularly during the pre- and postnatal periods when they are most vulnerable and most in need of assistance. The males' contributions at this point can have a substantial influence on the females' inclusive fitness without real cost to the latter, since they cannot conceive again anyway. As Hrdy (1979) wrote, "The most plausible and widely cited hypothesis, advocated by Desmond Morris and others, is that continuous sexual attractiveness helped to elicit male support for the mothers of helpless human infants" (p. 313).

Fourth, at least up to a point, the more a male has invested in any particular offspring, the greater is the cost of later neglecting or abandoning it, although of course there will always be both costs and benefits (in a fitness sense) of either staying to parent or abandoning one's offspring.

Fifth, males may often need other males as allies (for example, in hunting), and to maintain such alliances, they may refrain from pursuing their allies' consorts.

Finally, because females are less fertile and often less sexually receptive while pregnant or lactating, it is to the advantage of males to dispose of offspring who are not their own, thus gaining access to receptive females. It is therefore important to putative fathers to protect their young (and female partners) against marauding males. This may be especially important in species, such as humans, in which offspring have a long period of relative dependency.

All these factors work together to ensure that males benefit by behaving in a less promiscuous fashion than a simple analysis of the situation would lead one to expect. Because all six conditions apply among humans, furthermore, we would expect these forces to be operative, with the pull of male promiscuity countered—but not counterbalanced—by the need to provision and protect females and young in order to maximize inclusive fitness. One also finds among humans social practices designed to maximize certainty about paternity. These practices include marriage (both monogamous and polygamous), harsh sanctions for adulterous women and tolerant attitudes toward vengeful cuckolds, the sexual double standard, and other

social arrangements designed to keep women in relative seclusion from other males. Marital arrangements explicitly offer males a trade-off between greater certainty regarding paternity, on the one hand, and responsibility for the protection/provisioning of the family as well as reduced access to other females, on the other. Biosocial circumstances thus serve to ensure that the goal for modern males is not to maximize the number of sexual encounters and fertilizations, but to maximize the number of offspring—regarding whose paternity there is some confidence—who are conceived and raised in health to reproductive maturity and beyond. Although parents seldom verbalize desires to continue the family name or propagate one's genes as the reasons to have children, respondents, especially in rural third-world countries, do claim to consider the economic utility derived from children and the likelihood of their survival (Hoffman, Thornton, & Manis, 1978; Arnold, Bulatao, Buripakdi, Chung, Fawcett, Iritani, Lee, & Wu, 1975). Optimal reproductive strategies for both males and females may differ at different stages of the life span, however, so individuals may pursue mixed or variable strategies.

Provisioning or Breadwinning

In contemporary western societies the dominant family role played by men is that of economic breadwinner (e.g., Cazenave, 1979; Benson, 1968; Gronseth, 1972; Pleck, 1983). Fein (1976) and Yankelovich (1974) point out that most employees (at least in industrialized countries) view work not as a source of direct personal fulfillment but as a means of obtaining economic support, for themselves as well as for their families. Indeed, this is legally and socially defined as one of the primary duties or responsibilities of fathers (*American Jurisprudence*, 1968); surveys repeatedly suggest that men who are voluntarily derelict in this regard are frowned upon (Harris, 1971; Slocum & Nye, 1976). Recent public outrage about the failure of noncustodial fathers to pay child support illustrates these popular attitudes. It is also noteworthy that a man's success or potential success as a breadwinner serves as one important criterion for mate selection in both modern and "primitive" contexts, one consequence of which is the "marriage gradient," a term for the widespread tendency of women to marry men of higher status than themselves. Recent historical research, however, reveals that the male breadwinner role is a recent normative ideal (Pleck, 1976). Prior to this century women had a clearly defined and socially recognized economic role, albeit one that involved different provisioning activities than men undertook. (The same of course is true in almost all "primitive" societies.) Further, it is well known that increasing proportions of wives are employed and that there are growing numbers of employed single mothers (Glick & Norton, 1979). Nonetheless, family economic providing is typically defined today as a male's responsibility.

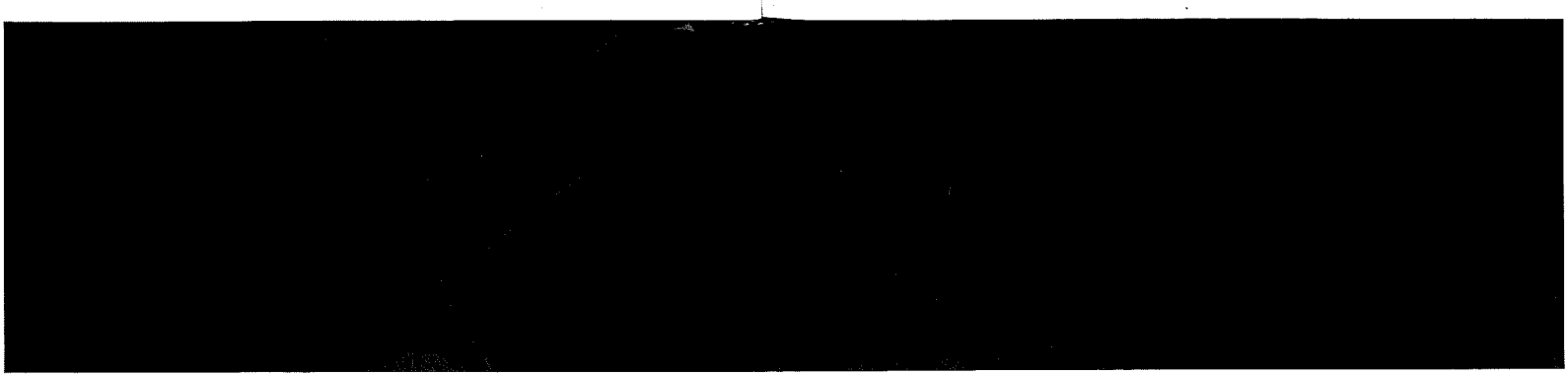
Even when women play a major role in family breadwinning (whether by gathering, agriculture, or paid work), both they and their offspring clearly benefit from the security provided by the presence and commitment of a male provider. Meanwhile, gender discrimination in market economies helps ensure that fathers/husbands remain the primary sources of family provisioning. Men's inability to provide materially for their families appears to be a major source of masculine self-humiliation and marital discomfort (Cavan, 1959; Campbell *et al.*, 1976; Komarovsky, 1940; Voydanoff, 1983).

In sum, even though breadwinning has been deemphasized and devalued in recent examinations of "the changing nature of fatherhood," it may be that breadwinning/provisioning is as important—probably more important—to filial survival (and thus to paternal inclusive fitness) than direct father–child interaction. Indeed, it is probable that fathers have been able to incorporate direct father involvement into their roles only in recent, affluent times. In almost all cultures direct paternal involvement is a discretionary activity, whereas provisioning is mandatory. Finally, although it seems unlikely that women select mates on the basis of their child-rearing skills or propensities, women in both industrialized and nonindustrialized contexts certainly do consider wealth and breadwinning potential in selecting among suitors. Even after marital dissolution, societies emphasize the provisioning component of the father's role. Despite this, psychologists—especially recently—have been most concerned about fathers' direct interaction and involvement with children, and it is to such aspects of paternal behavior that we now turn.

PATERNAL COMPETENCE OR SENSITIVITY

In both the popular and professional literature it is commonly assumed that women are more competent as parents than men are. Two related questions are thus addressed in this section: do such differences exist, and if so, to what can they be attributed? The second of these questions, of course, can be posed at many levels: Why in an ultimate sense should women in general be more competent than men, and by what proximate mechanisms might these differences be brought about?

Sensitivity (or responsiveness) to infant signals is a topic that has been of interest to developmental psychologists for many decades because it has long been assumed that parental sensitivity determines the quality of parent–child relationships, which in turn is seen as the major determinant of the child's psychosocial development. Thus, sensitivity is a crucial aspect of parental competence. Unfortunately, the relevant research is of variable quality, and the concept itself has been operationalized in many different ways. Perhaps the most useful and popular formulation is that of the ethological attachment theorists (Ainsworth, 1973; Bowlby, 1969; Lamb,



1978, 1981a; Lamb & Easterbrooks, 1981), who propose that human infants are biologically predisposed to emit signals (e.g., cries, smiles) to which parents are biologically predisposed to respond. When adults consistently respond promptly and appropriately to infant signals, infants come to perceive them as predictable and reliable. This perception may potentiate the formation of secure infant–parent attachments (Ainsworth, Bell, & Stayton, 1974; Lamb 1981a). By contrast, when adults do not respond sensitively, insecure attachments may result, and when they respond rarely, no attachments at all may develop. Although these hypotheses have not yet been substantiated empirically (Lamb, Thompson, Gardner, Charnov, & Estes, 1984), they remain plausible and make clear why it may be crucial to determine if fathers are appropriately responsive to their infants; when they are not, the likelihood of secure or high-quality father–infant relationships forming would be reduced.

There is another reason why research on paternal sensitivity is important. Several theorists (e.g., Klaus, Trause, & Kennell, 1975) have speculated that an innate predisposition to respond to infant signals is stronger in females than in males. If true, this would imply that biology limits the potential for males to have significant and direct influences on infant development. Unfortunately, the suggestion is based largely on evidence concerning hormonal influences on parental behavior in rodents and ungulates, and these animal models may be inappropriate (Lamb & Goldberg, 1982; Lamb & Hwang, 1982). In addition, recent studies have shown that fathers and mothers respond similarly to presentation of their newborn infants (Rodholm & Larsson, 1982), even though fathers do not experience hormonal priming, and that there is no "sensitive period" during which human mothers are primed to bond to their newborn offspring (Lamb, 1982a; Lamb & Hwang, 1982). Nevertheless, the implications of Klaus *et al.*'s suggestion are such that it merits serious consideration.

In an early interview study Greenberg and Morris (1974) reported that most fathers were elated by the birth of their infants and experienced strongly positive emotions that Greenberg and Morris termed "engrossment." No comparison with mothers' reactions were reported, however. Contrary to popular misconceptions, when mothers and fathers were observed in a maternity ward interacting with their newborn infants, the fathers were neither inept nor uninterested (Parke & O'Leary, 1976; Parke, O'Leary, & West, 1972; Parke & Tinsley, 1981). Indeed, all but a couple of measures showed that the fathers and mothers were equivalently involved in interaction. When later observed feeding their infants, both fathers and mothers responded to infant cues either with social bids or by adjusting the pace of the feeding (Parke & Sawin, 1977). Although the fathers were capable of behaving sensitively, they tended to yield responsibility for child-tending chores to their wives when not asked to demonstrate their competence for the investigators. However, fathers, like mothers, adjust their speech patterns when interacting with young children—they speak more slowly, use shorter phrases, and repeat themselves more often when talking to infants than when talking to adults (Phillips & Parke, 1979; Gleason, 1975; Golinkoff & Ames, 1979; Kauffman, 1977; Blount & Padgug, 1976).

Alternative ways of studying parental responsiveness to infant signals have been pursed by Feldman and Nash and by Frodi and Lamb. Both research teams have observed parents with unfamiliar infants rather than with their own. Although the reasons for responding to unfamiliar infants should—and probably do—differ from the reasons for responding to one's own offspring, these studies are still useful as tests of whether or not fathers are *capable* of "maternal responsiveness," regardless of whether they typically behave in this fashion (i.e., the competence/performance distinction).

Feldman and Nash (1977, 1978; Nash & Feldman, 1981; Feldman, Nash, & Cutrona, 1977) observed subjects individually while they sat in a waiting room containing an infant and its mother. They found that sex differences in "baby responsiveness" waxed and waned depending on the subject's age and social status. Females were more responsive than males in early adolescence and in early parenthood, whereas there were no sex differences among 8 year olds, childless couples, and unmarried college students. Feldman and Nash concluded that sex differences in responsiveness to infants are experientially rather than physiologically determined: They are evident when individuals are under increased social pressure to respond in a conventionally sex-typed fashion. The data indicated that in response to presumed social pressures, mothers were more responsive than fathers.

By contrast, the studies conducted by Frondi and Lamb revealed no sex differences in responsiveness to infants. In their first two studies (Frodi, Lamb, Leavitt, & Donovan, 1978; Frodi, Lamb, Leavitt, Donovan, Neff, & Sherry, 1978), the psychophysiological responses (heart rate, blood pressure, skin conductance) of mothers and fathers were monitored while the parents observed quiescent, smiling, or crying infants on a television monitor. Crying and smiling infants elicited characteristic and distinct psychophysiological response patterns in both mothers and fathers. In a later study, Frodi and Lamb (1978) found no sex differences in psychophysiological responses among either 8 to 14 year olds, whereas 14-year-old females were more behaviorally responsive than males in a waiting room situation similar to Feldman's. Like Feldman and Nash, Frodi and Lamb concluded that there were no physiologically based sex differences in responsiveness to infants and that behavioral dimorphisms emerged primarily in response to societal pressures and expectations. For a behavioral ecologist, of course, this conclusion begs the question: *Why* do almost all societies subject boys and girls/men and women to sex-differentiating pressures of these sorts?

The conclusion that socializing pressures constitute the best proximate

explanation of sex differences in parental behavior appears to be consistent with all the relevant data currently available, including data from studies of nonparental adults and children (see Berman, 1980 for a review). Nevertheless, the fact that men *can* be as responsive as women does not mean that mothers and fathers typically *are* equivalently responsive. Fathers are not always highly responsive, and their responsiveness probably varies depending on the degree to which they participate in infant care, since caretaking experience appears to facilitate parental responsiveness (Zelazo, Kotelchuck, Barber, & David, 1977). It is also possible—if not probable—that females are more likely than males to seek out, be offered, and learn from opportunities to acquire child-care skills, so that physiological sex differences play a role in shaping—but do not determine or ensure—sex differences in parenting skills. As Lamb and Goldberg (1982) wrote:

> Parental behavior in humans must surely rank as one of the clearest examples of overdetermined behavior. In additon to hormonal influences, each young woman is subjected to many years of socializing pressures preparing her for the maternal role. . . . In the midst of such a complex and comprehensive set of influences, it seems unlikely that hormonal influences make unique and independent contributions to the emergence of parental behavior in humans. In other words, if hormonal influences do render women better prepared and suited for parental behavior than men, this advantage is secured largely by way of an extensive overlay of socialization (p.61).

Recent research, albeit with marmoset fathers, confirms that physiological and social factors work together in complex ways. Dixson and George (1982) showed that circulating levels of prolactin increased after male marmosets had carried their offspring. In this case it seemed that involvement produced the hormonal change, rather than the reverse. In terms of proximate causation, overall, it would seem that socialization and physiological factors work together; indeed, as far as individual behavior is concerned, they are probably deterministic. We should also ask, however, *why* it is that humans socialize females and males differently, and *why* there might be sex-differentiated predispositions. The answer, we propose, is that females "*need*" parenting skills in a way that males do not; child care is a much more important component of their total reproductive effort than it is for men, and their potential reproductive yield (in terms of live births) is so much smaller than men's that they cannot afford to risk the demise of their offspring.

PARENTAL STYLES OF MOTHERS AND FATHERS

Despite sex differences in parental responsiveness, fathers appear on average to be sufficiently responsive to their infants so that, with a sufficient

amount of father–infant interaction, attachments should form. Observational studies indicate that most infants do form attachments to their fathers, and the attachments to mothers and fathers emerge at about the same time—in the middle of the first year of life (Belsky, 1979; Lamb, 1977; Kotelchuck, 1976).

This evidence, however, is not sufficient to demonstrate that fathers play a formatively significant role in child development. It could be argued, for example, that fathers are essentially redundant—that they are occasional mother substitutes who have little independent impact on child development. This possibility has stimulated research designed to determine whether mothers and fathers represent different types of experiences for their children and thus perhaps have distinct and independent effects. Related research has also been motivated by questions regarding the origins (i.e., societal or physiological) of gender-linked differences in the style of parental behavior.

Even in the first three months of life, fathers and mothers appear to engage in stylistically different types of interactions with their infants. When videotaped in face-to-face interaction, for example, fathers tended to provide staccato bursts of both physical and social stimulation, whereas mothers tended to be more rhythmic and containing (Yogman, Dixon, Tronick, Als, Adamson, Lester, & Brazelton, 1977). Mothers addressed their babies with soft, repetitive, imitative sounds, whereas fathers touched their infants with rhythmic pats (Yogman *et al.*, 1977). During visits to hospitalized premature infants, mothers were responsive to social cues, fathers to gross motor cues (Marton & Minde, 1980).

Most of the data concerning the characteristics of interaction with older infants have been gathered in the course of naturalistic home observations. Lamb (1976, 1977) found that fathers tended to engage in more physically stimulating and unpredictable or "idiosyncratic" play than mothers did. Since these types of play elicited more positive responses from infants, the average response to play bids by fathers was more positive than the average response to maternal bids. Power and Parke (1979, 1982) and Clarke-Stewart (1978) later confirmed that American mothers and fathers engaged in different types of play, and Sagi, Lamb, Shoham, Dvir, and Lewkowicz (1985) reported similar differences in a study of Israeli kibbutznikim. Belsky (1979), by contrast, did not find any differences of this kind in a study of American parents and infants. However, both Lamb (1976, 1977) and Belsky (1979) found that mothers were more likely to hold infants in the course of caretaking, whereas fathers were more likely to do so in playing with the babies or in response to the infants' requests to be held. It is not surprising that infants responded more positively to being held by their fathers than by their mothers (Lamb, 1976, 1977). Clarke-Stewart (1978, 1980) found that fathers gave more verbal directions and positive reinforcements than mothers did, and were rated higher than mothers on the ability

to engage children in play. For their part, babies showed more enjoyment and involvement when playing with fathers than with mothers, and came to prefer playing with them when they had a choice (see also Lamb, 1976; Lynn & Cross, 1974). When parents were asked to choose an activity in which to engage their infants, mothers—at least middle-class mothers—tended to choose intellectual activities, whereas fathers selected playful social-physical activities (Clarke-Stewart, 1978).

Data gathered by interview confirm that fathers are identified with playful interactions whereas mothers are associated with caretaking. According to Kotelchuck's (1975) informants, mothers spent a greater proportion of their total interaction time caretaking than fathers did (50 versus 25%), whereas fathers spent a greater proportion (75 versus 50%) of their interaction time in playful social interaction than mothers did. Similar differences were reported by Russell (1983) in a study of Australian families with somewhat older children: 82% of fathers' total interaction time involved play, while caretaking constituted 38% of mothers' total interaction time. Relative to the total amount of interaction, Clarke-Stewart's (1978) data also suggested that fathers were consistently notable for their involvement in play, although their relative involvement in caretaking increased over time. Rendina and Dickerscheid (1976) did not record maternal behavior (making a comparison of maternal and paternal behavior impossible), but it is clear that fathers spent most of their time in playful interaction; on average, only 3.8% of the time was spent in caretaking. A study of English families reported similar findings. From maternal interviews, Richards, Dunn, and Antonis (1975) found that at both 30 and 60 weeks, the most common father–infant activity in 90% of the families was play. Routine involvement in caretaking was rare: only 35% regularly fed their infants at 30 weeks and 46% at 60 weeks. Diaper-changing and bathing were the least common paternal activities.

Interestingly, the results of a recent study by Pedersen, Cain, and Zaslow (1982) suggest that the patterns of interaction may differ when both parents are employed full-time. When observed with their infants, employed mothers stimulated their infants more than nonemployed mothers did, and they were far more interactive than their husbands were. In accordance with the findings just reviewed, fathers with nonemployed wives played with their infants more than the mothers did, but this pattern was reversed in the families with employed mothers. Maternal responsibility for caretaking, however, did not differ depending on the mothers' working status.

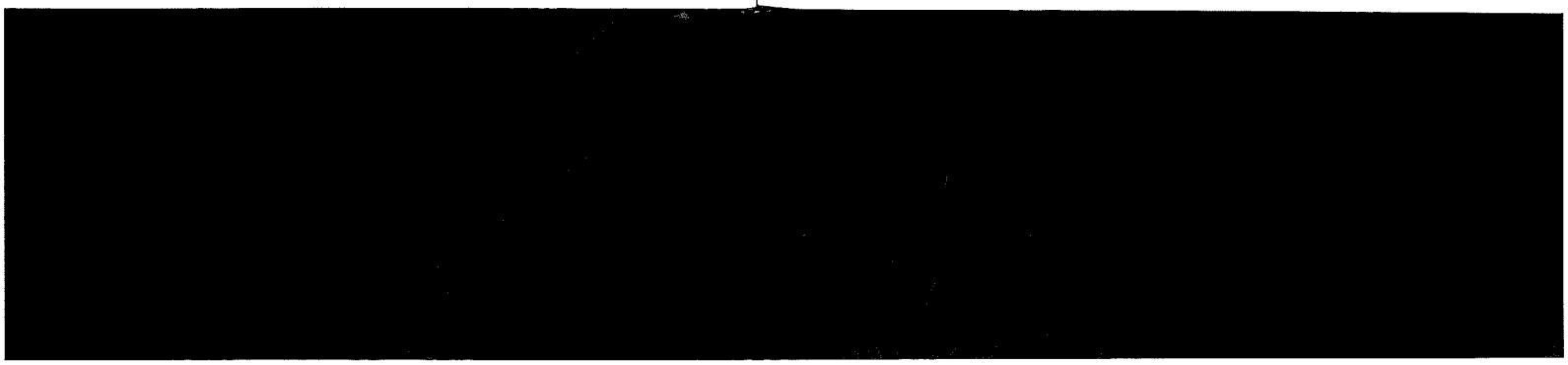
There is little solid evidence available concerning the origins or effects of paternal and maternal play styles, although there has been much popular debate about whether they have physiological or social/experiential origins. In attempts to address this issue, two studies have focused on the behavioral differences between primary and secondary caretaking fathers (and, in one case, mothers). In the first, Field (1978) found that primary caretaking fathers behaved more like mothers than secondary caretaking fathers did, although

there were still differences between primary caretaking mothers and fathers. Particularly noteworthy was the fact that playful and noncontaining interactions were more common among fathers regardless of their caretaking responsibilites. However, naturalistic observation of the interactions between 3, 8, and 16 month olds and their Swedish parents in the second study showed that gender was a more powerful determinant of parental behavior than family type (Lamb, Frodi, Hwang, Frodi, & Steinberg, 1982c, d; Lamb, Frodi, Frodi, & Hwang, 1982a). In this study, there were few reliable differences associated with the caretaking role, or the interaction of caretaking role and gender, whereas there were several effects based on the gender of the parent, with mothers more likely to kiss, hug, talk to or smile at, tend to, or hold their infants than fathers were. Contrary to first impressions, these findings do not imply that there are physiologically based differences. It seems more likely that the differences are attributable—in a proximate sense—to the years of sex differentiated socialization and social interaction experienced by men and women. Whether these behavioral differences (a) directly serve any ultimate purpose, (b) are epiphenomena related to behavioral tendencies that have some ultimate purpose, or (c) have no direct or indirect ultimate purpose, remains unknown.

One unexplained and unexpected finding reported by Lamb *et al.* (1982a, d) in their longitudinal study of Swedish families was that the Swedish fathers were never distinguished for their playfulness like American, British, and Israeli fathers are. Lamb *et al.* (1983) also found that the Swedish infants, regardless of their fathers' degree of involvement in caretaking, consistently preferred their mothers over their fathers on attachment behavior measures. This suggests that, regardless of its origins, the typical playfulness of fathers may play a role in making interaction with them especially salient and affectively rewarding, so that attachments form despite the more limited amount of time infants spend with fathers than with mothers.

DEGREE OF PATERNAL INVOLVEMENT

In this section the amount of time that fathers spend with, and the degree of responsibility they assume for, their children is considered. For analytic purposes, it may be helpful to think of paternal involvement in terms of three components: interaction, availability, and responsibility (Lamb, Pleck, & Charnov, 1985). *Interaction* refers to the father's direct contact with his child through caretaking and shared activites. *Availability* is a related concept concerning the father's potential availability for interaction, by virtue of being present or accessible to the child whether or not direct interaction is occurring. *Responsibility* refers to the role the father takes in ascertaining that the child is taken care of and arranging for resources to be available for the child. For example, this might involve arranging for baby-sitters, making



appointments with the pediatrician and seeing that the child is taken to him/her, determining when the child needs new clothes, and so on. Although this aspect of the parental role is extremely important, it has been researched much less thoroughly than have interaction and availability. In most cases, the degrees of interaction and availability are interrelated, and both appear to potentiate the development of a sense of responsibility on the father's part. Thus, there is a moderate (though imperfect) association among the three aspects of father involvement.

Fathers' Interaction with Their Children

In a reanalysis of data from a recent nationally representative time-diary study, the 1975–1976 Study of Time Use, Pleck (1982) examined fathers' time in caretaking and other interactive activities with their children. Employed fathers whose youngest child was aged 5 or under spent an average of 26 minutes per day in such interaction with their children. Fathers with a youngest child aged 6 to 17 reported spending an average of 16 minutes per day. In this study, fathers' interaction time with their children varied little in absolute terms, depending on whether the mothers were employed, although it did, of course, vary in relative terms. Depending on the age of the youngest child, fathers' interaction amounted to between a third and a half of the time reported by mothers who were employed outside the home, and between a fourth and a fifth of the time reported by mothers who were not employed. The 1965–1966 Study of Americans' Use of Time (Robinson, 1977) produced relatively similar figures (Pleck, 1982, 1983, 1984).

Several smaller-scale studies also provide data about fathers' time in interaction with their children. For example, Pedersen and Robson (1969), by interviewing mothers, found that fathers reportedly spent between 45 minutes and 26 hours per week (with a mean of 8 hours) interacting with their 8- to 9½-month-old infants. Much lower levels of interaction were reported by Lewis and Weinraub (1974): for their subjects, the average amount of father–infant interaction was between 15 and 20 minutes per day.

There have been relatively few small-scale studies focused on paternal interaction with children older than infants and toddlers, and all have involved intact, middle-class, and typically white, families. In one such time-diary study, parents reported that fathers spent about 4 hours per week in direct interaction with their third and fourth grade children (Zeigler, 1980). Mothers spent about 5 hours a week, and there were no differences related to the children's sex. Baruch and Barnett (1983), however, found that fathers spent a little over 2½ hours per day interacting with their kindergartners and older children up to fourth graders. In a study of Australian fathers from diverse socioeconomic backgrounds, Russell (1983) found that fathers spent an average of 11 hours per week interacting with their children, compared with 32 hours for mothers. In another study, Montemayor (1982) found that tenth graders in Salt Lake City reported spending about 1 hour per day in interaction with or engaged in the same activities as their fathers. The same amount of time was spent with mothers. In both cases, the amount is about equivalent to the time involved in eating meals and doing chores together.

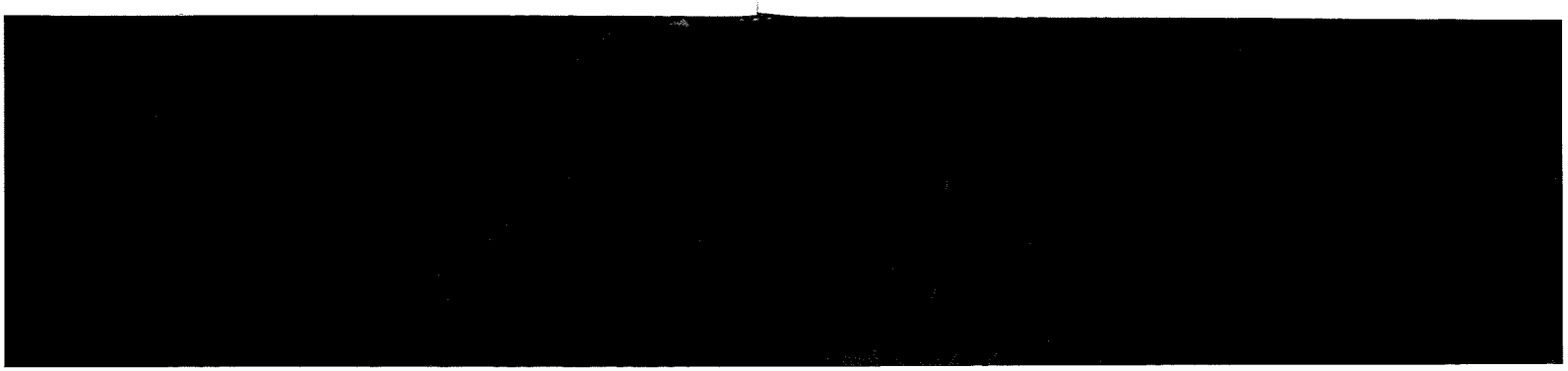
Some of the studies discussed above noted great variation in the extent of fathers' interaction, and the growing number of studies focused on nontraditional families indicates there are at least some families in which fathers are as involved as, or more involved than, the mothers (DeFrain, 1979; Grønseth, 1975; Lamb, Frodi, Hwang, & Frodi, 1982b; Levine, 1976; Radin, 1982; Russell, 1982; Sagi, 1982). Since none of the studies involve random samples of the population, however, it is hard to estimate how common these sorts of families are. On the basis of his quasi-random sample of Australian families, Russell (1983) estimated that these families represent about 1 to 2% of the total.

Excluding these studies of nontraditional families, the estimates of fathers' interaction time range from about 15 minutes to about 2½ hours per day. This broad range is understandable in light of the many ways in which the studies themselves vary. First, they differ in how broadly or narrowly "interaction" is defined. Second, it is noteworthy that the highest figures come from studies of interaction with either infants or preschool-aged children. Third, the lowest figures tend to derive from studies using actual diaries of time use rather than estimates made by mothers or fathers themselves; the fact that time diaries yield such low figures is especially notable because they concern a father's time with *all* his children, not just a single child as in the other studies. An exception to both of the latter trends, however, is the fact that one of the lowest average figures comes from Lewis and Weinraub's (1974) study of father–infant interaction, which is based on estimates.

Fortunately, some of these studies also make possible estimates of the extent of fathers' interaction expressed as a proportion of mothers' interaction, and here the variability from study to study proves to be much less. Fathers' proportion of mothers' interaction appears to vary around a baseline figure of about a third. However, fathers' proportion of mothers' interaction appears to vary systematically in relation to other variables, from only a fifth of mothers' to nearly the same level. It is higher when the mother is employed and when the children are older. With school-age children, some studies (e.g., Montemayor, 1982; Zeigler, 1980) find that fathers' interaction level actually attains, or nearly attains, parity with mothers'.

Fathers' Availability to Their Children

As far as paternal availability is concerned, Robinson (1977) found that in the 1965–1966 Survey of Americans' Use of Time, men with at least one



child under age four reported being available to their children between 2.0 and 2.7 hours per day, depending on the exact number of children in the home. Men whose children were all over four reported being available 2.5 to 3.9 hours per day. For employed wives, the comparable ranges were 2.9–5.8 hours per day and 2.4–4.0 hours per day, respectively; for nonemployed wives, the ranges were 6.5–7.8 hours and 3.8–6.0 hours, respectively (Robinson, 1977, Table 3.8). In these data, therefore, the availability of fathers with preschoolers varied between one third and two thirds of their wives', depending on their employment status. Fathers of school-age children reported between two thirds and nearly the same amount of availability as mothers.

Another national survey, the 1977 Quality of Employment Survey (Quinn & Staines, 1979), also provided data concerning parents' availability to their children (Pleck, 1981, 1983). Parents made separate estimates for working and nonworking days of "how much time they spent with their children," a concept that parents appeared to interpret quite broadly. Among fathers with a youngest child under age six, the average father reported spending 3.6 hours per day if the wife was employed, and 2.6 hours per day if his wife was not employed. Among fathers with youngest children ages 6 to 17, those with employed wives reportedly spent 2.1 hours per day, while those with nonemployed wives said they spent 2.0 hours per day (Pleck, 1982). These figures were between 50 and 65% of the amounts of time reported by the comparable group of employed mothers.

In Pedersen and Robson's (1969) study the mothers reported that the fathers were accessible an average of 26 hours per week, or almost 4 hours a day. From interviews with 180 middle-class mothers and fathers, Kotelchuck (1975) determined that fathers spent an average of 3.2 waking hours per day accessible to their infants, whereas mothers spent 9 hours. In a much smaller study ($N = 12$) Golinkoff and Ames (1979) reported that fathers were accessible for 3.2 hours per day on average, compared with 8.3 hours for mothers.

Russell's (1983) study of Australian fathers yielded considerably higher figures. On average, fathers were reportedly available to their young children roughly 33 hours per week, while the comparable figure for mothers was 76 hours. In a study of American fathers of kindergartners through fourth graders, Baruch and Barnett (1983) reported a similarly high estimate–5–6 hours a day. By contrast, Zeigler's (1980) study of third and fourth graders generated a smaller figure: 12.5 hours per week for fathers compared to 21 hours per week for mothers.

Studies of fathers' availability, like those of fathers' interaction, produce a range of results. Fathers are, on the average, available to their children between 1.75 and 4 hours a day. Considered as a proportion of mothers' availability, different studies find fathers are available from between a third as much as mothers to just as much as mothers. As was true for interaction,

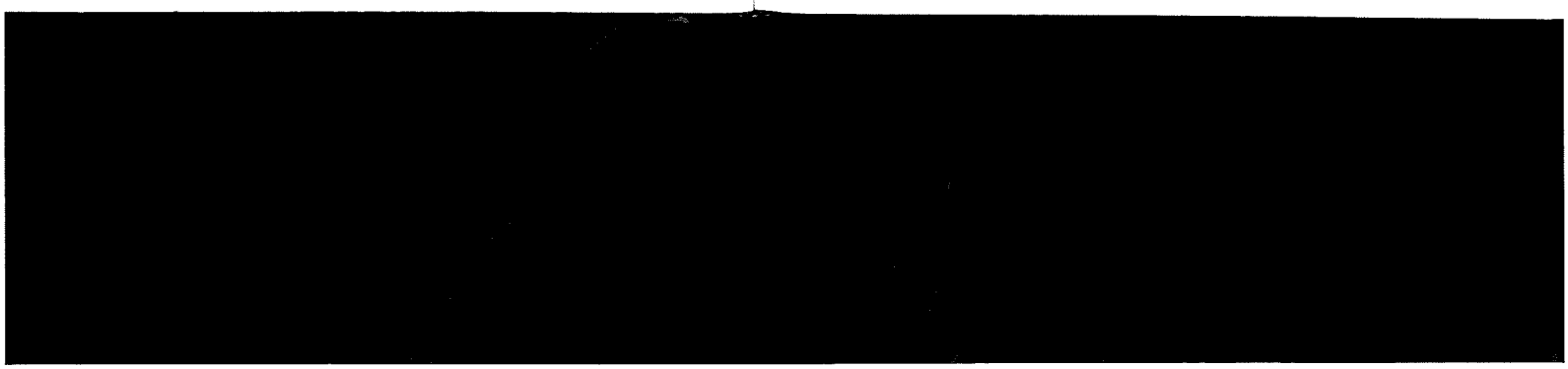
fathers' proportional availability appears higher when children are older and when mothers are employed, although in absolute terms availability declines as children grow older and increases only modestly in cases of maternal employment. Across the group of studies as a whole, the estimates appear to vary around a baseline proportion of about a half. Thus, while paternal interaction averages about a third of mothers', paternal availability is somewhat higher—around half of mothers'.

Fathers' Responsibility

Spending time with one's children or being available to them is not the same thing as being responsible for them. Kotelchuck (1975, 1976) and Russell (1983) both asked fathers and mothers about the fathers' degree of responsibility for their children. Only 7.5% of Kotelchuck's respondents claimed to share responsibility equally, and 75 percent did not take *any* responsibility for daily care. In Russell's study the average father was *solely* responsible for the children only 1 hour per week, compared with 40 hours for the average mother. Further, 80% of the fathers did not assume sole responsibility regularly, and 60% had never taken sole responsibility for their children (though their children were preschoolers). Likewise, in Baruch and Barnett's (1983) study 113 of 160 fathers reported being responsible for no child-care tasks, 35 were responsible for one, and 12 for two or three of the 11 specific tasks about which they were asked. In the 1977 Quality of Employment Survey (Quinn and Staines, 1979), fathers and mothers in two-earner families (but not married to each other) were asked, "If someone has to be home with your child (children) to do something for him (her, them) when you are both supposed to be working, which of you is more likely to stay home?" The father was more likely to stay home in only about 15% of the families; in only 5% did parents respond, "It depends." In comparison to studies of interaction and availability, research on the extent and nature of fathers' responsibility for their children is only beginning, but the data available so far show clearly that fathers are far less responsible for their children than mothers are.

Recent Changes in Paternal Involvement

Several studies indicate that the level of father involvement has increased over the last several decades. In a 50-year follow-up study, for example, Caplow and Chadwick (1979) reported that in 1924 about 10% of all fathers were reported by mothers to spend *no* time with their children, compared with 2% in 1976. Likewise, the proportion of fathers spending more than 1 hour a day with their children increased significantly (no data provided). In



a follow-up of Walker and Woods' (1976) subjects, Sanik (1981) found that fathers with infants and toddlers were spending more time with their children in 1977 than in 1967, though there were no comparable changes among fathers of older children. Consistent with this, Daniels and Weingarten (1981) found (from interviews with 86 families in the Boston area) that twice as many children born in the 1970's received care form their fathers on a regular (daily) basis than was reportedly true of children born in the 1950's and 1960's. Finally, survey data gathered from a nationally representative sample in 1975 and a subsample in 1981 clearly show the increases in paternal involvement that have occurred in the last decade (Juster, in press). Juster reports that men in the prime child-rearing age range (18–44 years) spent 2.29 hours per week in child care in 1975 and 2.88 hours in 1981—an increase of 26%. For women, the amount rose from 7.96 to 8.54 hours—an increase of 7%.

Most time-diary studies report overall declines in the levels of women's total family work (Pleck, 1983). Thus, for example, Juster (in press) reported a decline of 23% from 1965 to 1975, and a further 3% between 1975 and 1981 among 25- to 44-year-old women. However, in the two most recent studies in which women's *child-care* involvement at two points in time was specifically compared, Juster found an increase of 7%, whereas Sanik (1981 who controlled for the ages of children) reported no historical change. Several hypotheses have been offered in an attempt to explain the overall declines in women's family work: increased maternal employment, smaller average family size, more efficient home care technology, and lower household standards of neatness and cleanliness (Robinson, 1982). Although there is some support for the first two hypotheses, support for the last two is, as yet, weak.

Previous investigations have, by contrast, offered no explanations for the increases in men's involvement in child care. The fact that this increase is occurring in the context of stable or only slightly rising maternal involvement in child care; declining overall family work participation by women, and declining family size suggests that increased motivation on the part of fathers to be involved is attributable to changing cultural values that encourage direct paternal involvement.

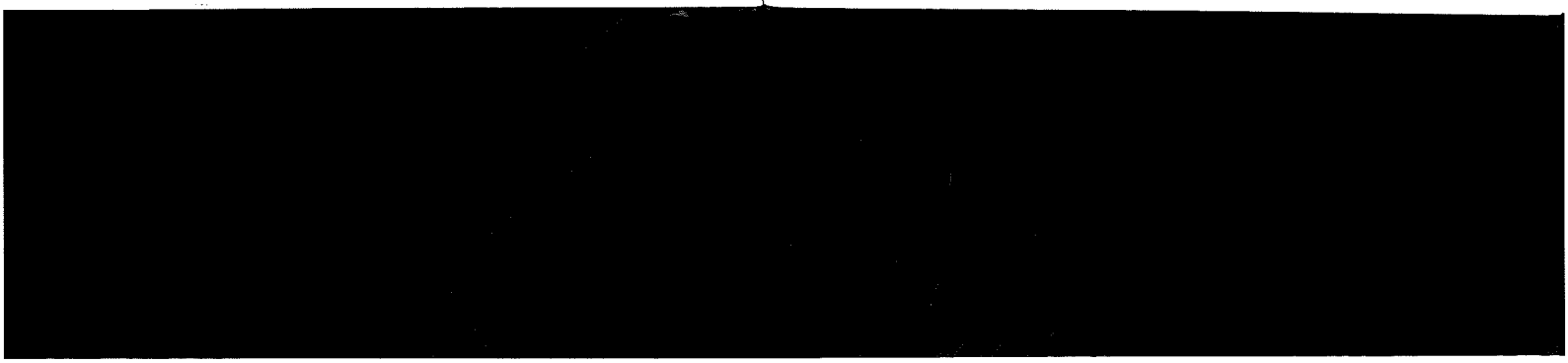
DETERMINANTS OF PATERNAL INVOLVEMENT

Many think that American fathers participate only minimally with their children, whereas others believe that contemporary fathers are highly involved. The truth lies somewhere between these extreme positions. There is no question that fathers, on the average, interact less with and are less available to their children than mothers. When mothers are employed, and/or when older children are involved, studies suggest that paternal availability—and in a few studies paternal interaction—approaches and even equals the levels of maternal availability and interaction. Rarely, however, do fathers assume responsibility for their children. In this section an explanation for these sex differences in parental involvement is explored.

As indicated earlier, male and female roles in reproduction are such that sex differences in parental involvement would be expected, all else being equal. However, the relevant ecology in the late 20th century North America may well differ substantially from our species' "environment of evolutionary adaptedness" (Bowlby, 1969): the inventions of the nursing bottle and of infant formula, to cite but two examples, changed the child-rearing environment in ways that potentially have a fundamental impact on parental behavior, in that they made it possible for persons other than lactating mothers to assume major infant-care responsibilities—namely, fathers. Some men have taken advantage of these opportunites, and the variability among fathers testifies to both the absence of deterministic and physiological barriers to paternal involvement and the influence of individual differences with respect to several personal and social-situational characteristics that appear likely to influence paternal involvement. As indicated earlier, these factors are not alternatives to a biological explanation; rather, they may represent crucial characteristics of the ecology within which mothers and fathers make choices regarding involvement. The net effect may be to override any predispositions that exist, although in most cases they tend to supplement or reinforce them. For analytic purposes, one can divide those factors explored by psychologists and sociologists into four categories: motivation, skills, supports, and institutional (workplace) barriers and opportunites. The fact that none of these factors accounts for more than a small proportion of the variance is revealing; it may mean that interactions are more important than simple main effects, or that social scientists have been exploring the wrong variables. In any event, it is important to recognize that these within-group explanations of variations in motivation for involvement are not necessarily the same factors important in explaining between-group (i.e., male versus female) differences. The latter could plausibly be attributed to years of sex-differentiated socialization based on assumptions regarding the differential propensities and likely future roles of men and women. Furthermore, in both cases, social scientists have not stepped back to ask why, in an ultimate sense, individual or gender differences might exist and what purpose might be served by the proximate mechanism on which social scientists focus.

Motivation

Clearly not all men want to be highly involved in the day-to-day care of their children, although large subgroups indicate that they are motivated to



be more involved. In a 1977 national survey 51% of husbands said that if they worked fewer hours, they would spend the extra time with their families (Quinn & Staines, 1979). Another 40% said they would *like* to work fewer hours so they could spend more time with their wives and children, even if this meant earning less money. As with all interview studies in this area, unfortunately, social desirability effects may obscure the achieved number of fathers who *really* want to be highly involved in child care. Highly involved fathers and fathers who reportedly want to be highly involved are more likely to have androgynous sex roles, although whether this is a cause or consequence of high involvement is not yet clear (Frodi, Lamb, Frodi, Hwang, Försstrom, & Corry, 1982; Lamb, 1982b; Russell, 1978. See also Russell, 1981). In a recent study, Coysh (1983) found that fathers with higher self-esteem, better marital relationships, and higher levels of participation in household tasks prenatally were more likely to become involved in child care. In addition, some involved fathers report that their own fathers were highly involved (Manion, 1977; Sagi, 1982), whereas others report that they wish to avoid being like their own uninvolved fathers (e.g., Baruch & Barnett, 1983).

Skills

Even when men want to be involved in child care, their involvement may be limited by a perceived or real lack of skills. As indicated earlier, men appear as competent as women in basic baby care, but they have often been denied the exposure (through baby-sitting, home economics, or family life classes) to the skills necessary for success in and enjoyment of child care. As families become smaller and more isolated, this is less and less a problem for men only: increasing numbers of new parents, *both* male and female, have had little if any opportunity to learn child-care skills. Both have to learn it "on the job." Again, however, the apparent importance of this learning does not preclude a role for biology. For example, it may be that girls are more likely to seek opportunities to learn child-care skills, are offered these opportunities more often, and perhaps learn the skills more rapidly than boys (as is the case in rats: see Rosenblatt, 1970), although both males and females have the potential to perform equally well once learning has been achieved. Thus, physiological predispositions, if they exist, likely depend on differential opportunities and experiences for mediation of any observable effect on the behavior of men and women.

Supports

High paternal involvement is unlikely to occur and be maintained unless significant others—mothers, relatives, friends, workmates—approve of this behavior. Interestingly, national surveys indicate that many mothers do not want their husbands to be more involved than they currently are (Pleck, 1982). In one survey, for example, only 23% of employed and 31% of nonemployed wives said that they would like "more help with the children" from their husbands, whereas in another survey 42% of the wives (all of whom were employed) said that they wished their husbands would "spend more time taking care of or doing things with the children." Just over half of the husbands interviewed felt that their wives wished them to be more involved. Thus, while a substantial number of fathers may receive encouragement to be more involved, a large number of men is clearly not being encouraged by their partners, whether or not they either want or feel competent to be more involved. Furthermore, even when mothers are supportive, friends, relatives, neighbors, and workmates may not be. Indeed, studies of nontraditional families in the United States and elsewhere find that highly involved fathers encounter frequent hostility on the part of their acquaintances, relatives, and workmates (e.g., Russell, 1982, 1983; Hwang, Eldén, & Fransson, 1984).

Again, one can legitimately seek to explain societal disapproval in psychological and sociological terms that emphasize the socialization of adults (factors that surely are important and provide the best proximate explanations of societal reactions), or one can step back further and ask why—in an ultimate sense—these reactions and socialization processes might exist. Among factors affecting relative inclusive fitness in this situation might be the possibilites of cuckoldry, with the unemployed father having greater potential access to employed men's wives (Hipgrave, 1979, 1982), and concern that, by avoiding workplace hazards, the involved father may prolong his own survival and increase the workload and danger level for others.

Institutional Factors

Finally, men's employers may simply prevent fathers from being as involved in child care as they would like to be. There is considerable evidence that employers do disapprove of men whose first priority appears to be to their families, and that employees fear this disapproval could be translated into actions which adversely affect the fathers' careers (Hwang et *al.*, 1984). However, it is also true that even when working hours or other circumstances permit increased family involvement without jeopardizing work roles or career advancement, the effect on family involvement is modest (Lamb, 1982c; Lamb & Levine, 1983; Pleck, 1982, 1983). Perhaps this should not be surprising. Changes in institutional practices should affect only those men who want to be more involved, feel they have the skills to do so, and are supported in their motivation. For those who lack motivation,

skills, or supports, changing institutional practices should be of no significance; the lack of response to changing institutional practices on the part of these fathers would hide any major effect on the smaller subgroup of fathers within the total group who *were* affected. Furthermore, the psychological importance of work to the fathers' sense of identity may be crucial, not only the objective constraints placed by specific employers on their employees' family roles.

Summary

The current literature thus leads us to identify five types of factors that influence relative paternal involvement—one involving ultimate and four involving proximate reasons. Evolutionary pressures may account for sex differences in the propensity for involvement, but the phenotypic expression of those tendencies is clearly influenced by social and economic factors that define the context in which individuals make choices in light of their predispositions and their presumed general goal—the maximization of inclusive fitness. Four of the possible proximate explanations of individual differences in paternal involvement are briefly discussed here: motivation, skills, support, and institutional practices. The probable strength of these factors in explaining individual differences in involvement undercuts deterministic physiological explanations of parental involvement, but should be seen as part of a more general biological answer responsive to Tinbergen's four questions concerning parental involvement.

CONCLUSION

In the last decade the study of father–child relationships among humans has blossomed, and we have begun to gather descriptive information concerning the extent of paternal involvement and the characteristics of father–child interaction. However, much remains to be researched in this area, particularly regarding variations based on culture, age of child, and socioeconomics in paternal behavior and involvement and concerning components of the paternal role other than direct paternal involvement—that is, provisioning, protection, and procreation. In addition, relatively few systematic attempts have been made to explain variations in the quality or extent of paternal behavior and involvement. Particular attention might be paid in the future to the fact that reproductive, provisioning, and parenting strategies are likely to be conditional, and vary depending on social circumstances and resources. Thus, for example, very different strategies may prove optimal for poor people and wealthy people, just as strategies certainly vary interculturally. Space constraints have precluded our discussion of these issues in the present chapter. Where the correlates of paternal involvement have been studied (e.g., Pleck, 1983) in the past, recourse has been made to data initially gathered for other reasons. Furthermore, the focus has been on proximate explanations—usually in terms of psychological or sociological factors—without regard for ultimate factors which may, when viewed in the context of ecological characteristics and various proximate factors, provide a broader and more satisfying answer to questions about paternal behavior in humans. Whether or not such is the case, we suggest that there is some value in addressing all four of Tinbergen's (1963) questions, and that developmental psychologists need to view biology and experience as complementary rather than mutually exclusive constructs.

SUMMARY

Unlike the other chapters in this volume, the focus herein is on *paternal* (rather than *maternal*) behavior. Drawing upon the framework provided by evolutionary theory and behavioral ecology, an attempt is made to recast the available evidence concerning the behavior of human males. Fathers and mothers do not differ with respect to behavioral sensitivity or responsiveness early in their children's lives. Many studies have shown, however, that fathers spend much less time with their children than mothers do, although their involvement has been increasing. We suggest that the degree of paternal involvement is a function of the socioecological constraints upon parental behavior. The identification of mothers with child care and fathers with play may be influenced by biogenetic tendencies as well as the social roles prescribed for fathers and mothers in contemporary societies.

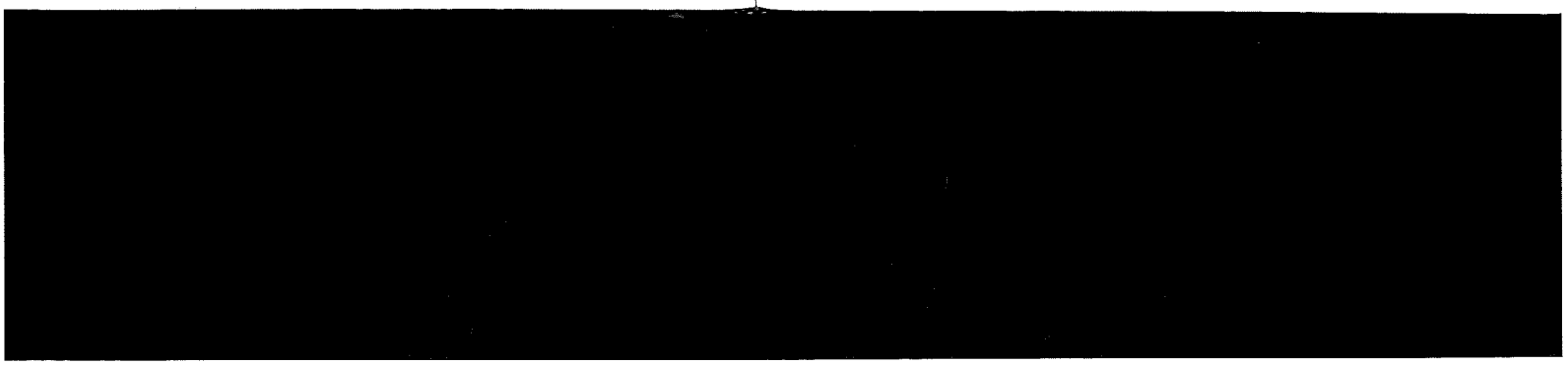
ACKNOWLEDGMENT

This chapter is based, in part, on work conducted by The Fatherhood Project, which was funded by the Ford, Levi Strauss, Ittelson, and Rockefeller Family foundations. We are grateful to these organizations for their support.

REFERENCES

Ager, J.W., Werley, H.H., Allen, D.V., Shea, F.P., and Lewis, H.Y. Vasectomy: Who gets one and why? *American Journal of Public Health*, 1974, 64, 680–686.

Ainsworth, M.D.S. The development of infant-mother attachment. In B.M. Caldwell and H.N. Ricciuti (Eds.), *Review of Child Development Research*, Vol. 3. Chicago, IL: University of Chicago Press, 1973.



Ainsworth, M.D.S., Bell, S.M., and Stayton, D.J. Infant–mother attachment and social development: "Socialization" as a product of reciprocal responsiveness to signals. In M.P.M. Richards (Ed.), *The Integration of a Child into a Social World*. Cambridge: Cambridge University Press, 1974.

American Jurisprudence, Vol. 41. Rochester, NY: American Bar Association, 1968.

Arnold, F., Bulatao, R.A., Buripakdi, C., Chung, B.J., Fawcett, J.T., Iritani, T., Lee, S.J., and Wu, T.S. *The Value of Children: A Cross National Study*, Vol. 1. Honolulu, HI: East-West Center, 1975.

Baruch, G.K., & Barnett, R.G. *Correlates of fathers' participation in family work: A technical report*. Working Paper #106. Wellesley, MA: Wellesley College Center for Research on Women, 1983.

Belsky, J. Mother–father–infant interaction: A naturalistic observational study. *Developmental Psychology*, 1979, *15*, 601–607.

Belsky, J. Early human experience: A family perspective. *Developmental Psychology*, 1981, *17*, 3–23.

Benson, L. *Fatherhood: A Sociological Perspective*. NY: Random House, 1968.

Berger, D.M. Couples' reaction to male infertility and donor insemination. *American Journal of Psychiatry*, 1980, *137*, 1047–1049.

Berman, P.W. Are women more responsive than men to the young? A review of developmental and situational variables. *Psychological Bulletin*, 1980, *88*, 668–695.

Bloom, L.J., and Houston, B.K. The psychological effects of vasectomy for American men. *Journal of Genetic Psychology*, 1976, *128*, 173–182.

Blount, B.G., and Padgug, E.J. Mother and father speech: Distribution of parental speech features in English and Spanish. *Papers and Reports on Child Language Development*, 1976, *12*, 47–59.

Bowlby, J. *Attachment and Loss*, Vol. 1: *Attachment*. NY: Basic Books, 1969.

Campbell, A., Converse, P., and Rodgers, W. *The Quality of American Life*. NY: Russell Sage, 1976.

Caplow, T., and Chadwick, P. Inequality and lifestyles in Middletown, 1920–1978. *Social Science Quarterly*, 1979, *60*, 367–385.

Cavan, R. Unemployment-crisis of the common man. *Marriage and Family Living*, 1959, *21*, 139–146.

Cazenave, N.A. Middle-income black fathers: An analysis of the provider role. *Family Coordinator*, 1979, *27*, 583–593.

Clarke-Stewart, K.A. And daddy makes three: The father's impact on mother and young child. *Child Development*, 1978, *49*, 466–478.

Clarke-Stewart K.A. The father's contribution to children's cognitive and social development in early childhood. In F.A. Pedersen (Ed.), *The Father-Infant Relationship: Observational Studies in a Family Setting*. NY: Praeger Special Publications, 1980.

Cord, E.L. A study of certain personality factors incident to vasectomy as an adjustmental device. *Dissertation Abstracts International*, 1972, *33-B* (5), 2340–2341.

Coysh, W.S. *Predictive and concurrent factors related to fathers' involvement in childrearing*. Paper presented to the American Psychological Association, Anaheim, CA, August, 1983.

Daniels, P., and Weingarten, K. *Sooner or Later: The Timing of Parenthood in Adult Lives*. NY: Norton, 1981.

DeFrain, J. Androgynous parents tell who they are and what they need. *Family Coordinator*, 1979, *28*, 237–243.

Dixson, A.F., and George, L. Prolactic and parental behavior in a male New World primate. *Nature (London)*, 1982, *299*, 551–553.

Ehrhardt, A., and Baker, A. Fetal androgens, human central nervous system differentiation, and behavior sex differences. In R.C. Friedman, R.M. Richart, and R.L. Vande Wiele (Eds.) *Sex Differences in Behavior*. NY: Wiley, 1974.

Fein, R. Men's entrance into parenthood. *Family Coordinator*, 1976, *25*, 341–350.

Feldman, S.S., and Nash, S.C. The effect of family formation on sex stereotypic behavior: A study of responsiveness to babies. In W. Miller & L. Newman (Eds.), *The First Child and Family Formation*. Chapel Hill, NC: North Carolina Population Press, 1977.

Feldman, S.S., and Nash, S.C. Interest in babies during young adulthood. *Child Development*, 1978, *49*, 617–622.

Feldman, S.S., Nash, S.C., and Cutrona, C. The influence of age and sex on responsiveness to babies. *Developmental Psychology*, 1977, *13*, 675–676.

Ferber, A.S., Tietze, C., and Lewit, S. Men with vasectomies: A study of medical, sexual, and psychosocial changes. *Psychosomatic Medicine*, 1967, *29*, 354–366.

Field, T. Interaction behaviors of primary versus secondary caretaker fathers. *Developmental Psychology*, 1978, *14*, 183–184.

Frodi, A.M. and Lamb, M.E. Sex differences in responsiveness to infants: A developmental study of psychophysiological and behavioral responses. *Child Development*, 1978, *49*, 1182–1188.

Frodi, A.M., Lamb, M.E., Leavitt, L.A., and Donovan, W.L. Fathers' and mothers' responses to infant smiles and cries. *Infant Behavior and Development*, 1978, *1*, 187–198.

Frodi, A.M., Lamb, M.E., Leavitt, L.A., Donovan, W.L., Neff, C., and Sherry, D. Fathers' and mothers' responses to the faces and cries of normal and premature infants. *Developmental Psychology*, 1978, *14*, 490–498.

Frodi, A.M., Lamb, M.E., Frodi, M., Hwang, C.-P., Försstrom, B., and Corry, T. Stability and change in parental attitudes following an infant's birth into traditional and nontraditional Swedish families. *Scandinavian Journal of Psychology*, 1982, *23*, 53–62.

Gleason, J.B. Fathers and other strangers: Men's speech to young children. In D.P. Dato (Ed.), *Language and Linguistics*. Washington, D.C.: Georgetown University Press, 1975.

Glick, P.C., and Norton, A.J. Marrying, divorcing, and living together in the US today. *Population Bulletin*, *32* (whole number 5), 1979.

Golinkoff, R.M., and Ames, G.J. A comparison of fathers' and mothers' speech with their young children. *Child Development*, 1979, *50*, 28–32.

Greenberg, M., and Morris, N. Engrossment: The newborn's impact upon the father. *American Journal of Orthopsychiatry*, 1974, *44*, 520–531.

Gronseth, E. The breadwinner trap. In L. Howe (Ed.), *The Future of the Family*. NY: Simon & Schuster, 1972.

Grønseth, E. *Work-sharing families: Adaptations of pioneering families with husband*

and wife in part-time employment. Paper presented to the International Society for the Study of Behavioral Development, Surrey (England), July, 1975.

Hamburg, D.A., and Goodall, J.V.L. Factors facilitating development of aggressive behavior in chimpanzees and humans. In J. de Wit and W.W. Hartup (Eds.), *Determinants and Origins of Aggressive Behavior*. The Hague: Mouton,1974.

Hamilton, W.D. The genetical theory of social behavior. *Journal of Theoretical Biology*, 1964, *7*, 1–52.

Harris, L. *The Harris Survey Yearbook of Public Opinion 1970*. NY: Louis Harris, 1971.

Hipgrave, T. Childrearing by lone fathers. In R. Chester, P. Diggory, and M. Sutherland (Eds.), *Changing Patterns of Child Bearing and Child Rearing*. London: Academic Press, 1982.

Hipgrave, T. *When the mother is gone: The position of the lone father*. Unpublished manuscript, University of Leicester, 1979.

Hoffman, L.W., Thornton, A., and Manis, J.D. The value of children to parents in the United States. *Population: Behavioral, Social, and Environmental Issues*, 1978.

Horenstein, D., and Houston, B.K. The effects of vasectomy on postoperative psychological adjustment and self-concept. *Journal of Psychology*, 1975, *89*, 167–173.

Hrdy, S. The evolution of human sexuality: The latest word and the last. *Quarterly Review of Biology*, 1979, *54*, 309–314.

Hwang, C.P., Eldén, G., and Fransson, C. *Arbetsgivares och arbetskamraters attityder till pappaledighet*. Rapport no. 1. Göteborg, Sweden: Psykologiska Institutionen, Göteborgs' Universitet, 1984.

Ingram, J.C. *Parent–infant interactions in the common marmoset (Callithrix Jacchus) and the development of young*. Unpublished Ph.D., University of Bristol, 1975.

Juster, F.T. A note on recent changes in time use. In F.T. Juster & F. Stafford (Eds.), *Studies in the Measurement of Time Allocation*. Ann Arbor, MI: Institute for Social Research, in press.

Kauffman, A.L. *Mothers' and fathers' verbal interactions with children learning language*. Paper presented to the Eastern Psychological Association, Boston, March, 1977.

Kendall, P.J. The relationship of vasectomy to self-concept. *Dissertation Abstracts International*, 1972, *33-B* (3), 1307–1308.

Klaus, M.H., Trause, M.A., and Kennell, J.H. *Human maternal behavior following delivery: Is it species specific*? Unpublished manuscript. Cleveland, OH: Case Western Reserve University, 1975.

Komarovsky, M. *The Unemployed Man and His Family*. NY: Dryden, 1940.

Kotelchuck, M. *Father caretaking characteristics and their influence on infant-father interaction*. Paper presented to the American Psychological Association, Chicago, September, 1975.

Kotelchuck, M. The infant's relationship to the father: Experimental evidence. In M.E. Lamb (Ed.), *The Role of the Father in Child Development*. NY: Wiley, 1976.

Krebs, J.R., and Davis, N.B. *An Introduction to Behavioural Ecology*. Sunderland, MA: Sinauer, 1981.

Lamb, M.E. Interactions between eight-month-old children and their fathers and mothers. In M.E. Lamb (Ed.), *The Role of the Father in Child Development*. NY: Wiley, 1976.

Lamb, M.E. Father–infant and mother–infant interaction in the first year of life. *Child Development*, 1977, *48*, 167–181.

Lamb, M.E. Social interaction in infancy and the development of personality. In M.E. Lamb (Ed.), *Social and Personality Development*. NY: Holt, Rinehart & Winston, 1978.

Lamb, M.E. The development of social expectations in the first year of life. In M.E. Lamb & L.R. Sherrod (Eds.), *Infant Social Cognition: Empirical and Theoretical Considerations*. Hillsdale, NJ: Erlbaum, 1981. (a)

Lamb, M.E. *The Role of the Father in Child Development* (revised edition). NY: Wiley, 1981. (b)

Lamb, M.E. Early contact and mother–infant bonding: One decade later. *Pediatrics*, 1982, *70*, 763–768. (a)

Lamb, M.E. Generalization and inferences about causality in research on nontraditional families: Some cautions. *Merrill-Palmer Quarterly*, 1982, *28*, 157–161. (b)

Lamb, M.E. Why Swedish fathers aren't liberated. *Psychology Today*, 1982, *18*(10), 74–77. (c)

Lamb, M.E., and Easterbrooks, M.A. Individual differences in parental sensitivity: Origins, components, and consequences. In M.E. Lamb and L. R. Sherrod (Eds.), *Infant Social Cognition: Empirical and Theoretical Considerations*. Hillsdale, NJ: Erlbaum, 1981.

Lamb, M.E., and Goldberg, W.A. The father–child relationship: A synthesis of biological, evolutionary and social perspectives. In L.W. Hoffman, R. Gandelman, & H.R. Schiffman (Eds.), *Parenting: Its Causes and Consequences*. Hillsdale, NJ: Erlbaum, 1982.

Lamb, M.E., and Hwang, C.-P. Maternal attachment and mother–neonate bonding: A critical review. In M.E. Lamb & A.L. Brown (Eds.), *Advances in Developmental Psychology*, Vol. 2. Hillsdale, NJ: Erlbaum, 1982.

Lamb, M.E., and Levine, J.A. The Swedish parental insurance policy: An experiment in social engineering. In M.E. Lamb and A. Sagi (Eds.), *Fatherhood and Family Policy*. Hillsdale, NJ: Erlbaum, 1983.

Lamb, M.E., Frodi, A.M., Frodi, M., and Hwang, C.-P. Characteristics of maternal and paternal behavior in traditional and nontraditional Swedish families. *International Journal of Behavioral Development*, 1982, *5*, 131–141. (a)

Lamb, M.E., Frodi, A.J., Hwang, C.-P. and Frodi, M. Varying degrees of paternal involvement in infant care: Attitudinal and behavioral correlates. In M.E. Lamb (Ed.), *Nontraditional Families: Parenting and Child Development*. Hillsdale, NJ: Erlbaum, 1982. (b)

Lamb, M.E., Frodi, A.M., Hwang, C.-P., Frodi, M., and Steinberg, J. Effects of gender and caretaking role on parent–infant interaction. In R.N. Emde & R. Harmon (Eds.), *Development of Attachment and Affiliative Systems*. NY: Plenum, 1982. (c)

Lamb, M.E., Frodi, A.M., Hwang, C.-P., Frodi, M., and Steinberg, J. Mother- and father-infant interaction involving play and holding in traditional and nontraditional Swedish families. *Developmental Psychology*, 1982, *18*, 215–221. (d)

Lamb, M.E., Frodi, M., Hwang, C.-P., and Frodi, A.M. Effects of paternal involvement on infant preferences for mothers and fathers. *Child Development*, 1983, *54*, 450–458.

Lamb, M.E., Thompson, R.A., Gardner, W., Charnov, E.L., and Estes, D. Security of infantile attachment. Its study and biological interpretation. *Behavioral and Brain Sciences*, 1984, *7*, 127–147.

Lamb, M.E., Pleck, J., and Charnov, E.L. Paternal behavior in humans. *American Zoologist*, 1985, *25*, 883–894.

Levine, J. (1976) *And Who Will Raise the Children? New Options for Fathers and Mothers*. Philadelphia, PA: Lippincott, 1976.

Lewis, M., and Weinraub, M. Sex of parent versus sex of child: Socioemotional development. In R.C. Friedman, R.M. Richart, and R.L. Vande Wiele (Eds.), *Sex Differences in Behavior*. NY: Wiley, 1974.

Lynn, D.B., and Cross, A.R. Parent preferences of preschool children. *Journal of Marriage and the Family*, 1974, *36*, 555–559.

Manion, J. A study of fathers and infant caretaking. *Birth and the Family Journal*, 1977, *4*, 174–179.

Marton, P.L., & Minde, K. *Paternal and maternal behavior with premature infants*. Paper presented to the American Orthopsychiatric Association, Toronto, April, 1980.

Montemayor, R. The relationship between parent-adolescent conflict and the amount of time adolescents spend alone and with parents and peers. *Child Development*, 1982, *53*, 1512–1519.

Nash, S.C., and Feldman, S.S. Sex role and sex-related attributions: Constancy or change across the family life cycle? In M.E. Lamb and A.L. Brown (Eds.), *Advances in Developmental Psychology*, Vol. 1. Hillsdale, NJ: Erlbaum, 1981.

Parke, R.D., and O'Leary, S. Father–mother–infant interaction in the newborn period: Some findings, some observations, and some unresolved issues. In K.F. Riegel and J. Meacham (Eds.), *The Developing Individual in a Changing World, Vol. 2: Social and Environmental Issues*. The Hague: Mouton,1976.

Parke, R.D., and Sawin, D.B. *The family in early infancy: Social interactional and attitudinal analyses*. Paper presented to the Society for Research in Child Development, New Orleans, March, 1977.

Parke, R.D., and Tinsley, B.R. The father's role in infancy: Determinants of involvement in caregiving and play. In M.E. Lamb (Ed.), *The Role of the Father in Child Development* (Rev. ed.). NY: Wiley, 1981.

Parke, R.D., O'Leary, S.E., and West, S. Mother–father–newborn interaction: Effects of maternal medication, labor and sex of infant. *Proceedings of the American Psychological Association*, 1972, 85–86.

Parke, R.D., Power, T.G., and Gottman, J. Conceptualizing and quantifying influence patterns in the family triad. In M.E. Lamb, S.J. Suomi, and G.R. Stephenson (Eds.), *Social Interaction Analysis: Methodological Issues*. Madison, WI: University of Wisconsin Press, 1979.

Pedersen, F.A., and Robson, K.S. Father participation in infancy. *American Journal of Orthopsychiatry*, 1969, *39*, 466–472.

Pedersen, F.A., Cain, R., and Zaslow, M. Variation in infant experience associated with alternative family roles. In L. Laosa and I. Sigel (Eds.), *Families: Research and Practice*, Vol. 1. NY: Plenum, 1982.

Phillips, R., and Parke, R.D. *Father and mother speech to prelinguistic infants*. Unpublished manuscript, University of Illinois, 1979.

Pleck, E. Two worlds in one: Work and family. *Journal of Social History*, 1976, *10*, 178–195.

Pleck, J.H. *Changing patterns of work and family roles*. Paper presented to the American Psychological Association, Los Angeles, August, 1981.

Pleck, J.H. *Husbands' and wives' paid work, family work, and adjustment*. Wellesley, MA: Wellesley College Center for Research on Women (Working Papers), 1982.

Pleck, J.H. Husbands' paid work and family roles: Curent research issues. In H. Lopata and J.H. Pleck (Eds.), *Research in the Interweave of Social Roles, Vol. 3: Families and Jobs*. Greenwich, CT.: JAI Press, 1983.

Pleck, J.H. *Working Wives and Family Well-Being*. Beverly Hills, CA: Sage, 1984.

Power, T.G., and Parke, R.D. *Toward a taxonomy of father–infant and mother–infant play patterns*. Paper presented to the Society for Research in Child Development, San Francisco, March, 1979.

Power, T.G., and Parke, R.D. Play as a context for early learning: Lab and home analyses. In L.M. Laosa and I.E. Sigel (Eds.), *Families as a Learning Environment for Children*. NY: Plenum, 1982.

Quinn, R.P., & Staines, G.L. *The 1977 Quality of Employment Survey*. Arbor, MI: Survey Research Center, 1979.

Radin, N. Primary caregiving and role-sharing fathers. In M.E. Lamb (Ed.), *Nontraditional Families: Parenting and Child Development*. Hillsdale, NJ: Erlbaum, 1982.

Redican, W.K., and Taub, D.M. Male parental care in monkeys and apes. In M.E. Lamb (Ed.), *The Role of the Father in Child Development* (Rev. ed.). NY: Wiley, 1981.

Rendina, I., and Dickerscheid, J.D. Father involvement with first-born infants. *Family Coordinator*, 1976, *25*, 373–378.

Richards, M.P.M., Dunn, J.F., and Antonis, B. *Caretaking in the first year of life: The role of fathers' and mothers' social isolation*. Unpublished manuscript, Cambridge University, 1975.

Robinson, J. *How Americans Use Time: A Social-Psychological Analysis*. NY: Praeger, 1977.

Rodgers, D.A., Ziegler, F.J., and Levy, N. Prevailing cultural attitude about vasectomy: A possible explanation of postoperative psychological response. *Psychosomatic Medicine*, 1967, *29*, 367–375.

Rödholm, M., and Larsson, K. The behavior of human male adults at their first contact with a newborn. *Infant Behavior and Development*, 1982, *5*, 121–130.

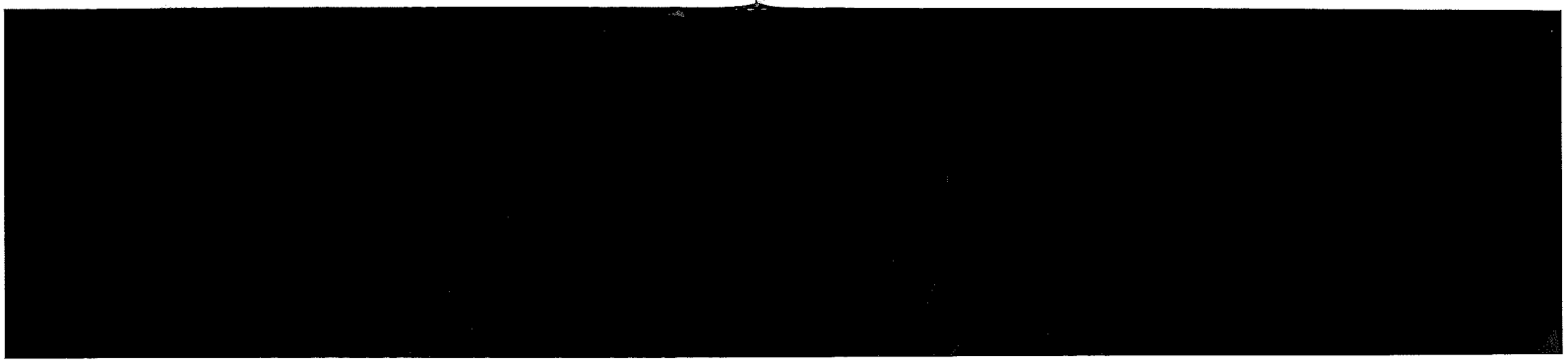
Rosenblatt, J.S. The development of maternal responsiveness in the rat. *American Journal of Orthopsychiatry*, 1970, *39*, 36–56.

Russell, G. The father role and its relation to masculinity, femininity, and androgyny. *Child Development*, 1978, *49*, 755–765.

Russell, G. Shared-caregiving families: An Australian study. In M.E. Lamb (Ed.), *Nontraditional Families: Parenting and Child Development*. Hillsdale, NJ: Erlbaum, 1982.

Russell, G. *The Changing Role of Fathers*? St. Lucia, Queensland: University of Queensland Press, 1983.

Sagi, A. Antecedents and consequences of various degrees of paternal involvement



in child rearing: The Israeli project. In M.E. Lamb (Ed.), *Nontraditional Families: Parenting and Child Development*. Hillsdale, NJ: Erlbaum, 1982.
Sagi, A., Lamb, M.E., Shoham, R., Dvir, R., and Lewkowicz, K.S. Parent-infant interaction in families on Israeli kibbutzim. *International Journal of Behavioral Development*, 1985, *8*, 273–284.
Sanik, M. Division of household work: A decade comparison—1967–1977. *Home Economics Research Journal*, 1981, *10*, 175–180.
Slocum, W., and Nye, F.I. Provider and housekeeper roles. In F.I. Nye (Ed.), *Role Structure and Analysis of the Family*. Beverly Hills, CA: Sage, 1976.
Symons, D. *The Evolution of Human Sexuality*. NY: Oxford University Press, 1979.
Tinbergen, N. On aims and methods of ethology. *Zeitschrift fur Tierpsychologie*, 1963, *20*, 410–433.
Trivers, R.L. Parental investment and sexual selection. In B.G. Campbell (Ed.), *Sexual Selection and the Descent of Men: 1871–1971*. Chicago, IL: Aldine, 1972.
Walker, K., and Woods, M. *Time Use: A Measure of Household Production of Family Goods and Services*. Washington, D.C.: American Home Economics Association, 1976.
Williams, G.C. *Adaptation and Natural Selection*. Princeton, NJ: Princeton University Press, 1966.
Wilson, E.A. Sequence of emotional responses induced by infertility. *Journal of the Kentucky Medical Association*, 1979, *77*, 229–233.
Van den Berghe, P. *Man in Society*. NY: Elsevier, 1978.
Van den Berghe, P. *Human Family Systems: An Evolutionary View*. NY: Elsevier, 1979.
Voydanoff, P. Unemployment as a family stressor. In H. Lopata and J.H. Pleck (Eds.), *Research in the Interweave of Social Roles*, Vol. 3: *Families and Jobs*. Greenwich, CT: JAI Press, 1983.
Yankelovich, D. The meaning of work. In J. Rosow (Ed.), *The Worker and the Job*. Englewood Cliffs, NJ: Prentice-Hall, 1974.
Yogman, M.W., Dixon, S., Tronick, E., Als, H., Adamson, L., Lester, B.M., and Brazelton, T.B. *The goals and structure of face-to-face interaction between infants and their fathers*. Paper presented to the Society for Research in Child Development, New Orleans, March, 1977.
Zeigler, M. *The father's influence on his school-age child's academic performance and cognitive development*. Unpublished doctoral dissertation. Ann Arbor, MI: University of Michigan, 1980.
Zelazo, P.R., Kotelchuck, M., Barber, L., and David, J. *Fathers and sons: An experimental facilitation of attachment behaviors*. Paper presented to the Society for Research in Child Development, New Orleans, March, 1977.

6 PARENTAL SUPPLEMENTS AND SURROGATES AMONG PRIMATES: CROSS-SPECIES AND CROSS-CULTURAL COMPARISONS

James J. McKenna

INTRODUCTION

In a memorable scene from his recently released film, *The Lonely Guy*, comedian Steve Martin enters a very large, crowded, and obviously expensive restaurant. After a formal but nevertheless cordial greeting from the maître d', Martin is asked how many persons are in his party. When he responds, "Just one," a visibly shaken host gasps with disbelief and in a questioning tone of voice repeats, "Just one?" Instantly a deafening silence ensues while every person in the restaurant ceases to converse and turns to stare at a now terribly ashamed Martin as he is led, not inconspicuously, to his table. The silence and stares continue while Martin sits alone trying unsuccessfully not to feel self-conscious. Finally Martin calls back the maître d' and asks him to request the restaurant patrons to resume their prior activities; and with just a snap of his fingers a cacophony of voices rising from a hundred different conversations begins as the patrons shift their gaze away from "the lonely guy."

This scene is particularly amusing because most of us can identify with what Martin was feeling as well as with what those who were staring at him were feeling. It is an instructive scene because it reminds us of the kinds of social meanings we attach to companionship and the lack thereof, and how these social meanings affect the way we feel. In one sense, there is no question that the awkward and embarrassed Martin, the sympathetic maître d', and even the nosy patrons who, undoubtedly sad for Martin but glad it was not they who were alone, are simply reflecting some shared cultural values; but they are also displaying a sensitivity to companionship, and indeed sociality, that has an evolutionary as well as developmental basis. For example, like other primates who experience prolonged childhoods, the human infant begins to establish a series of "multiplex" relationships with individuals other than the parents shortly after birth. Some of these individuals offer direct assistance and care to the infant and, as a result, contribute substantially to the child's socioemotional development. Other