

# GENDER AND PARENTHOOD\*

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*This paper reviews demographic trends in longevity and the sex ratio, marriage and fertility, and household composition for the illumination they provide to an understanding of parenting in individual lives and to the social ambiance surrounding childbearing and -rearing in contemporary society. Second, the paper reviews gender differences in parenting as reflected in recent research on solo fathering and mothering, nontraditional family arrangements, and egalitarian marriages that show significant paternal involvement in childrearing. Third, the paper assesses the adequacy of current social explanations of gender differences in parenting, and demonstrates the relevance of an expanded explanatory model that draws upon bio-evolutionary theory and the neurosciences.*

### INTRODUCTION

This analysis of gender and parenthood begins with the judgment that none of the theories prevalent in family sociology—exchange, symbolic interaction, general systems, conflict, phenomenology, feminist, or developmental—are adequate to an understanding and explanation of human parenting because they do not seek an integration of biological and social constructs. Research on age and aging has attempted such an integration, while research on gender has studiously avoided efforts in this direction. Gender differentiation is not simply a function of socialization, capitalist production, or patriarchy. It is grounded in a sex dimorphism that serves the fundamental purpose of reproducing the species. Hence sociological units of analysis such as roles, groups, networks, and classes divert attention from the fact that the subjects of our work are male and female animals with genes, glands, bone and flesh oc-

cupying an ecological niche of a particular kind in a tiny fragment of time. And human sexual dimorphism emerged from the long prehistory of mammalian and primate evolution. Theories that neglect these characteristics of sex and gender carry a high risk of eventual irrelevance against the mounting evidence of sexual dimorphism from the biological and neurosciences.

It had been my hope, over the course of the past decade, that the life-span perspective in developmental psychology, and the life-course perspective in sociology, might develop in the direction of integrated biosocial theories, but this has not yet been the case. The "in" concept in adult development these days is "change," but the change both life-span and life-course social scientists are currently enamored of consists of cohort, historical period, and timing effects rather than maturation, and neither perspective has systematically dealt with sex and gender. Their assumptions vacillate between the view that men and women are free, purposive actors charting their own lives (or would be if the economy permitted them to do so), and the view that we are chameleons responsive to changing currents of opinion and historical events.<sup>1</sup>

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<sup>1</sup> This is not to downplay the great intellectual excitement of much recent research guided by a life-course perspective in sociology and demography (Easterlin, 1980; Elder, 1974, 1982; Elder and Liker, 1982; Elder and Rockwell, 1976, 1978; Riley, 1976; Riley and Waring, 1976; L. Russell, 1982). Such work provides major insights into the processes through which specific historical events and demographic trends impact on social systems and individual lives.

By contrast, my assumption is that persistent differences between men and women, and variations in the extent to which such differences are found along the life line, are a function of underlying biological processes of sexual differentiation and maturation as well as social and historical processes.

The paper proposes no formal theory integrating biological and social constructs. Its goal is necessarily more humble, to clear the ground for the emergence of biosocial theories in the future. It begins with an examination of several demographic trends relevant to parenthood in individual lives and to the social ambience surrounding childbearing and -rearing in contemporary society. I begin with demographic trends because they suggest an unprecedented trend with important implications for a new pattern of gender differentiation. Second, the paper reviews gender differences in parenting as reflected in recent research on traditional and nontraditional family arrangements, and the effect of significant male investment in parenting for child outcome. With the evidence on these two topics before us, I will then assess the adequacy of current explanations of gender differences in parenting, and demonstrate the relevance of an expanded explanatory model that draws upon bio-evolutionary theory and the neurosciences.

#### DEMOGRAPHIC TRENDS AFFECTING GENDER ROLES AND PARENTING

A good starting place for understanding change in gender and parenting roles is several demographic trends: longevity and the sex ratio, marriage and fertility, and household composition.

##### *Longevity and the Sex Ratio*

For most of human history, it was a rare child who reached adulthood without intimate acquaintance with the death of a sibling and of one, if not both, parents. Many contemporary elderly people never knew their grandparents and have memories of their own parents only as middle-aged adults. Since mortality reduction is more palatable politically and psychologically than fertility reduction, longevity differences are narrowing between developed and developing societies. Davis and van den Oever (1982) calculate the life expectancy for men in 16 developing countries in the late 1970s at 60 years, while it was 68 in 20 developed nations. The counterpart averages for women were 64 and 75 in the two sets of countries.

A gender gap in length of life has accompanied the revolution in human longevity, greater in developed nations than in developing

countries, with the result that women in countries like our own enjoy on average 15 more years of life than men in developing countries (Davis and van den Oever, 1982).

The reason the overall sex ratio in developed countries is not lower is interesting: mortality reduction that produces a *female surplus* in old age is balanced by mortality reduction in infancy and childhood that produces a *male surplus* in the younger years. Countries that led the world in reducing infant deaths now show a male surplus well into the fourth decade of life. In the United States between 1910 and 1980, the sex ratio rose among those under 50 years of age, while it declined among those over 50 years of age (Davis and van den Oever, 1982).

The sex ratio will continue to rise among the young in the future, because of improved diet and prenatal care for pregnant women, and the widespread increase in heroic medical efforts to keep alive premature neonates. The reason recent medical efforts affect the sex ratio is rooted in a genetic difference between male and female: there are more points at which aberrations may occur in the fetal development of the male than of the female. Indeed, the estimated sex ratio at conception is about 125, which compensates for the higher rates of spontaneous abortion of male fetuses and higher neonatal death rates of male babies that characterized most of human history.

Increased longevity has particular relevance for the probability of parenthood for men compared to women. A longer life does not increase the reproductive potential of women, despite a secular trend to a younger age at menarche and a slightly older age at menopause (Lancaster and King, 1982), while a longer life can considerably expand the reproductive potential of men. This basic gender difference in reproductive span produces age selectivity in marriage in nonindustrial as well as industrial societies. Davis and van den Oever (1982:501) suggest "we are dealing with a phenomenon so fundamental that it is independent of economic development." Age hypergyny is also found among nonhuman primates, despite the fact that female primates remain fertile as long as they live (Altmann, 1983). Nor is it simply a matter of courtship initiative by old and young males competing for and winning young females, for many primate females actively select older, high-status males with demonstrated abilities (Lancaster, 1976), much as many human females do. The shorter reproductive span of the female compared to the male, coupled with earlier ages of sexual and social maturation of women and a probable persistence of high divorce rates, suggests that age hypergyny in marriage formation will remain highly resistant to change.

*Marriage Rates*

A male surplus in the younger years, coupled with age hypergyny, might be expected to produce higher marriage rates at younger ages for women, but this is clearly not the contemporary pattern. Increasing educational attainment contributes to marital postponement, but even among those in their late twenties, there has been a tripling of the proportion of women not married in 1980 compared to as short a time ago as 1967 (30 vs. 9 percent). Some portion of this increase is due to the marriage squeeze twenty years after a period of rising fertility rates, which produces a shortage of males a few years older than females, but the remainder represents voluntary postponement of marriage, an increase in preference for remaining unmarried, an increase in homosexuality, and the toll of divorce which leads to fewer remarriages among women than men. For men, social acceptance of sex outside marriage, economic uncertainty facing new entrants to the labor force, and the knowledge that their chances for marriage are not drastically reduced with age press for a postponement of marriage to older ages. Masnick and Bane (1980) predict that by 1990, 48 percent of men in their late twenties will still be unmarried.

Following a review of these trends, and the observation that for many women, from half to two-thirds of their adult lives will be without a husband, Davis and van den Oever (1982) suggest that marriage is "falling out of fashion."

*Fertility*

It is not clear whether becoming a parent is also "falling out of fashion." It is now generally accepted that the baby boom of the post-World War II period is the anomaly calling for explanation, and not the drop in fertility rates since the late 1950s (Cherlin, 1981). Population growth continues with an "echo boom" as the tail end of the baby boom cohort moves through the childbearing years, but expectations are that the "primary forces of social change conducive to later marriage and low fertility will persist" (Westoff, 1983:99). The lifetime birth expectations of young women are now below replacement level for their generation, and employment status has only a modest effect on these birth expectations (National Center for Health Statistics, 1982).<sup>2</sup>

But while families are becoming smaller and recent research shows a desire to postpone parenthood after marriage (Knaub et al., 1983),

almost all adults take on parenting responsibilities at some point in their lives. There has been only a slight increase in voluntary childlessness (Houseknecht, 1979; Veevers, 1979). Surveys among young women continue to show fewer than 10 percent enter adulthood with no expectation or desire for children (Blake, 1974, 1982). This figure may increase as public disapproval of childlessness softens (Blake, 1979). Huber and Spitze (1983) report a dramatic drop in the view that remaining childless is "selfish": only 21 percent of the women in their 1978 sample took this view, while more than 70 percent endorsed it in surveys five years earlier.<sup>3</sup>

The fertility trend worth watching concerns out-of-wedlock births. The overall rate of childbearing for unmarried women 15 to 44 years of age (29.4 per 1000 women) is now the highest rate ever recorded and represents 18 percent of all births. In the past, perhaps guided by an acceptance of Malinowski's (1930) principle of legitimacy, sociologists tended to view out-of-wedlock births as an unfortunate consequence of economic hardship, sexual exploitation of women, family disorganization, and lack of access to contraception and abortion. It has clearly not been seen as a pattern freely chosen by women. Yet such a trend has been in place for some time in Scandinavian countries (Westoff, 1978), where such births are not stigmatized, and unmarried mothers are not subjected to the "putdown" of characterizing their children as fatherless rather than as having a status derived from their mothers. Blake (1982) suggests a comparable trend is occurring in the United States.

Little is known as yet about what proportion of these births are motivated by a desire for a child coupled with no wish for a spouse. One trend worth watching is the growth of sperm banks and artificial insemination. Most women who seek artificial insemination do so because of infertility on the part of their partners, but there are also women in their late twenties and early thirties with no Mr. Right on the horizon and strong desires for a child before they run out of reproductive prime time. The Feminist

<sup>2</sup> As of June 1980, the lifetime birth expectations of women aged 18 to 24 was 2023 births per 1000 women (National Center for Health Statistics, 1982).

<sup>3</sup> Huber and Spitze are careful to point out that their item asked whether a "couple" was selfish if they did not have at least one child, which may have lowered the disapproval rate compared to earlier studies that asked about a "woman" remaining childless. In the latter case, 86 percent of a 1973 survey considered childless women selfish (Mason et al., 1976), compared to the 21 percent reported by Huber and Spitze. On the other hand, Huber points out that rapid opinion shifts do occur, and concludes there has probably been a reduction in social pressure to have children (Huber and Spitze, 1983:135-37).

Women's Health Center in Oakland, California, added insemination to its services in the fall of 1982 in response to local demand, and by the summer of 1983 close to one hundred women were being inseminated per month, one-third of them single women who wish children but not marriage (Bagne, 1983). Some proportion of this group are lesbian women, many in stable sexual relationships. The purposive choice of parenthood through artificial insemination and adoption by single women with economic independence is a trend worth monitoring in the future.

There is little evidence, then, for the view that parenting is falling out of fashion, at least among women. What these trends do suggest is that we may be moving through a period during which parenting is being separated from marriage, as sex was separated from marriage in an earlier period. If this happens, there will be a widening gap in the proportion of each sex carrying family responsibilities.

### *Household Composition*

The modal household in the United States has shifted from one headed by a marital pair rearing dependent age children to a household headed by a single adult (Kobrin, 1976a, 1976b; Masnick and Bane, 1980). Postponement of marriage, rising rates of separation and divorce, and longer years of widowhood have combined to effect an increase in single-adult-headed households, from 25 percent in 1960, to 35 percent by 1975, and a projected 45 percent in 1990. The trend to independent residence is particularly striking among young adults. Masnick (1983) has recently shown that as late as 1950, only 17 percent of unmarried women in their late 20s headed their own households; by 1980 this had jumped to 60 percent.

For an increasing proportion of well-educated young adults, there is now almost a decade between departure from their parents' household and the formation of a marital household. This moratorium from family living in early adulthood may eventually have positive effects, in the sense of greater equity, upon gender roles in employment and household division of labor, but less positive, if not negative effects, upon adjustment to parenthood. Increasing proportions of women are acquiring economic and social self-sufficiency through career commitment and employment continuity, which in turn reinforces independent political and social values and an expectation of equitable sharing of family and household responsibilities after marriage. By the same token, more young men are living on their own, acquiring competence (and, one hopes, taste) in the domestic skills they bring to marriage.

What is not clear is the impact of early adult independence on a couple's ability to shift concerns from their own personal gratifications to a shared and greater concern for the welfare and care of children. Solo living may increase skills in household maintenance, cooking and clothes care, but it contributes nothing to skill in caring for a child, or placing the needs and desires of others above one's own. Premarital independent living and postponement of childbearing after marriage may pave the way, for some couples, to an eventual decision to remain childless. That there may be greater difficulty when parenting is opted for was suggested in a pilot study of mine, in which late timing of parenthood was associated with greater reported difficulty in childrearing than early "on-time" parenting (Rossi, 1980a, 1980b).

Looking back over these various demographic trends suggests three general points relevant to the place of parenthood in individual lives and the ambiance surrounding child-rearing in the larger society. For one, small families with closely spaced births, coupled with greatly extended life spans, means childbearing and -rearing have become truncated, sharply contracted as a phase of life that previously occupied a significant proportion of adulthood. Only one in four American households now include even one dependent age child. On a societal level, this may carry with it an erosion of a major source of social integration. Slater ([1964] 1974) pointed out twenty years ago that parenting serves social functions by linking dyads to the community. More recently Fischer et al. (1977) and O'Donnell (1983) found that parents in the active stages of childrearing are more involved in neighborhood and community affairs than childless or postparental adults. Looking ahead, children's needs may have a lower priority on public agendas, since only a minority of political constituents will be rearing children, thus undercutting the responsiveness of elected public officials to the needs of the very young.

Second, there is a growing difference in the proportion of each sex that is carrying family responsibilities. Despite a slight shift toward shared or primary father custody of children, women overwhelmingly carry the major child-rearing responsibility following divorce. An increasing proportion of women are having children outside marriage, which implies a larger proportion of women than of men are tied into communal activities and institutions.

This gender gap in embeddedness in the caring institutions of society also carries broader political and social deviance implications. One may not go as far as French social scientist Gaston Bouthol (1969), who argues that the best predictor of war is a surplus in the

number of young unattached males, but sociologists need no reminder that the same subpopulation group predominates in sexual violence, alcohol and drug abuse, crime and social deviance. Unattached males roam the interstices between socially cohesive groups, kill and are themselves killed and maimed, but the machine cultures of the West have shown no inventiveness in developing new social institutions capable of providing individual loyalty and social integration to replace the bonds of family. Our only answers have been armies and prisons.

### GENDER DIFFERENCES IN PARENTING

There has been a significant shift in the language used in the social sciences to refer to human parenting. Twenty years ago parenting meant mothering, and studies either frankly labelled their subjects "mothers," or one quickly learned that all the subjects were women, though the title referred to parents. A decade ago, one began to see the label "care-giver," presumably to project the notion that parenting can be done not only by fathers as well as mothers, but by nonparent surrogates too (Lewis and Rosenblum, 1974). By the 1980s, the research literature has become richer and we can begin to compare fathering and mothering.

Three types of research permit a close-up view of what it is that men do when they carry primary child care responsibility and how they differ from the more traditional circumstance of women carrying this responsibility. The first type is *solo fathers*, men whose wives died or who hold custody of their children following divorce; these studies permit us to compare solo fathering with the more prevalent pattern of solo mothering. The second type are men in nontraditional family circumstances—communal groups or social contract couples. The third type are men in intact marriages who carry primary child care responsibilities out of a commitment to marriage and parenthood as a full partnership.

#### *Solo Fathers*

The best research on solo fathering has been conducted in England, where Hipgrave (1981) estimated fathers were 12 percent of all solo parents. Three factors are found in common between solo fathers and solo mothers: a more restricted social life, a somewhat more democratic style in family management, and when a new partner enters the domestic setting, some difficulty in deciding what responsibilities to delegate to the partner. Although solo mothers are far more apt to slip below the poverty level

than solo fathers, there is a considerable negative impact on income for solo fathers as well. Hipgrave found *half* the men experienced a decline in income after taking on childrearing responsibilities, only 12 percent attributable to the loss of a wife's earnings. In another study, some 35 percent of solo fathers left their jobs in order to meet their parental responsibilities for young children (George and Wilding, 1972). Most of the income drop was a direct result of increased parental responsibility: shifting to less demanding but lower-paying jobs; loss of overtime pay in order to mesh with children's schedules; absenteeism to care for ill children; and a drop in social ties with business or professional associates that had increased income in the past.

The problems of solo parenting differ for men and women. Solo fathers receive more volunteer help from friends and kin, probably because men are assumed to be less capable of childrearing than women, but when men do not receive unsolicited help and they need it, they are less apt to seek it out than solo mothers. Solo fathers make fewer new social contacts than solo mothers, because men make new contacts primarily through informal association with work colleagues, which they have little time for once they become solo parents.

Solo fathers show anxiety about their role just as solo mothers do, but on different grounds: many men report that although their children seemed to be faring well at the moment, they expect trouble in future, some anticipating a "volcanic eruption" when their children enter puberty. The men feel they fall down in providing intimate emotional support to their children, particularly their daughters, a finding also reported in American studies (Santrock and Warshak, 1979; Santrock et al., 1982). Solo mothers' anxiety centers on inability to maintain past living standards, and a breakdown of disciplinary control, particularly where sons are concerned. Discipline problems do not emerge in the experience of solo fathers, who follow stricter rules and are more consistent in disciplining their children.

That there is some reality to these parental concerns is suggested by the changes that attend remarriage by solo parents. Daughters in solo-father households benefit with the entry of a stepmother—as sons do in solo-mother households with the entry of a stepfather. Wallerstein and Kelly (1980) report increased self-control and a growth of emotional maturity in boys who acquire stepfathers, and increased emotional maturity and subjective self-confidence for girls who acquire a stepmother. Hence it seems to be the absence of a same-sex parent that has a negative impact on children, while the *kind* of impact varies by gender.

### *Alternate Family Forms*

The best single study of the impact of alternate family forms upon child development is a longitudinal study in Los Angeles that has run for six years, beginning with a first interview with the mothers in their third trimester of pregnancy (Eiduson et al., 1982). Four family forms are being studied for their impact on child development: communal living groups, unmarried social contract couples, unmarried solo mothers, and traditional two-parent families.

Two findings hold for all four family types. One is a shift to greater social conventionality, predictable from the assumption that parenthood ties adults more closely into social institutions. The reversion to more traditional gender roles that has been noted in other studies of the transition to parenthood (Entwistle and Doering, 1981; Fischer, 1979; Shapiro, 1979) is also found in the nontraditional family types in Eiduson's study. The second pattern shown in all four family types is for the mother to provide the primary care for the children up to the age of eighteen months. Men entered the child care scene only when the child was walking and talking.

The unmarried mothers in this study are of special interest because they consist of two distinct types: predictably, most are young women who accepted unintended pregnancies and kept their babies; the second type were nest-building women who become pregnant intentionally, who are well educated, hold good jobs and enjoy reasonable incomes—a first empirical example of the type discussed earlier. As a group, the solo mothers report a problem similar to that found in studies of divorced mothers, though their children are still too young to see its full ramifications: their sons verge on problem behavior more often than daughters or sons in the other three family types. In none of the family arrangement types have men played any significant role in child-rearing. Hence, marital styles seem more amenable to change than parenting styles.

### *Egalitarian Fathers*

The most interesting study, for our purposes, of intact couples in which the father carried primary child care responsibility was conducted by Radin (1982) with middle-class Michigan couples with a child between three and six years of age. She compared families in which men took on primary child care while their wives worked or attended school with traditional couples in which women were the primary caregivers. Her interest in doing the study was to test whether it was sex or social role that explains the unique effects of fathers

on children and their different treatment of sons and daughters.

One important finding from the Radin study is the absence of any differences between parents in egalitarian and traditional families on sex-role orientation (Bem scale) or strictness on a child-discipline measure of family rules. That may seem surprising until one notes that the *children* in egalitarian families perceive their fathers to be more forceful, assertive, and strict than children did from traditional families. It was the daily exposure to the egalitarian fathers that mattered, since these men followed the rules they felt important and enforced discipline on their children.<sup>4</sup> Traditional fathers were simply not there to exercise the norms they espoused to the researcher.

A second finding relevant to Radin's major question concerning sex versus social role is a difference between men and women in the problems they experienced in their childrearing pattern. The majority of the egalitarian fathers reported personal costs in terms of impeded careers as their major problem, while the counterpart problem for their wives was loss of close involvement with their children. This finding prompts Radin (1982:198) to conclude that "even when parents choose to violate sex role expectations, there are still internal pressures to fulfill the tasks for which they were socialized." It is dubious whether these results merely reflect residual effects of prior socialization.

Finally, there are decided contrasts in child outcome between the egalitarian and traditional patterns of childrearing: egalitarian fathers engage in more cognitive stimulation of both sons and daughters than occurs in traditional families. They engage in more direct teaching efforts and their children show the effect of such input from their fathers: children of egalitarian fathers scored higher on internal locus of control and on verbal intelligence than did the children in traditional families. These children were too young to test for arithmetic ability, but the results are consistent with Biller's finding that children of solo mothers score less well on mathematical aptitude tests than children in intact families (Biller, 1974).

In none of the studies were primary caregiver fathers in charge of babies and toddlers. All the children were three years of age or older. Why 18 months of age is a significant

<sup>4</sup> G. Russell's study of Australian couples (1982), comparable in many ways to Radin's American study, also reports that both spouses in co-parenting couples consider the father to have higher standards for child behavior and to be stricter in rule enforcement than men in traditional families.

watershed in paternal child care is not readily apparent, particularly since breast feeding is now a minor pattern in American infant feeding. Some clues are provided in qualitative material on a couple in LaRossa and LaRossa's study (1981) of the transition to parenthood, unusual in that the husband was caring for an infant son on a regular basis. I will describe this case in some detail since it illustrates points I shall elaborate on later.

Stuart is a history professor who gave four mornings a week to infant care while his wife taught and an older child attended nursery school. The father reported things went well for the first three months, because the baby slept most of the morning and he could put in three hours on lecture preparations. As the baby began to sleep less, trouble began, and Stuart reports he was unable to comfort the child. Asked about his feelings under such circumstances, he reports he felt "anger," "frustration," "sometimes I go pound my fist on the wall or something like that."

By contrast, he takes increasing pleasure in his two-year-old daughter. In this passage from an interview, note what it is that delights Stuart:

my older child now is verbal . . . she dresses herself, takes care of herself, goes to the bathroom by herself, everything, a more or less autonomous being . . . and I just enjoy that tremendously. (LaRossa and LaRossa, 1981:193-94)

The daughter's skills in taking care of herself reduce the need for physical caregiving by the father; she is accessible to verbal communication and her autonomy permits Stuart to get on with his own work.

Fathering for Stuart involves being in charge and teaching the child. This makes for a good part of his frustration in dealing with his infant son. As much as he is able to, he seems to avoid direct interaction. Asked what he does when the baby is awake, Stuart says:

I try to do something constructive still, maybe a little reading or some project around the house . . . sometimes I'll be in here in the same room with him, other times I'll just let him play by himself. (LaRossa and LaRossa, 1981:194)

When the interviewer suggests Stuart seems not to interact much with his son, Stuart explains:

Uh, not on a continuous basis . . . I mean, I give him a bottle; he's just learning to hold it up for himself now. I continually will teach him things or try to: how to hold his bottle, how to get it if it's fallen over to one side . . .

Right now I am trying to teach him how to roll over . . . he should know by now, but he's got this funny way. He tries to roll over with his arms stuck straight out . . . also, I will interact with him . . . by trying out new toys. (LaRossa and LaRossa, 1981:195)

Later in the interview, Stuart confesses to finding a "certain degeneracy" in himself. He reports that when the baby is too fussy to permit him to concentrate on his work, he invents little things to do "to sort of occupy my time." Eating is one of these things, and he admits he has put on "fifteen or twenty pounds" since his son's birth.

Most of the fathers in the LaRossa study did not even try to become significantly involved in the care of the newborn. The LaRossas use two concepts to capture the contrast between the mothers and fathers in their early induction to the parenting role: *role distance* and *role embracement*. They suggest men distance themselves from the parental role in early infant care: The men act clumsy when handling the baby and show less skill than they actually possess when in company. The fathers also tended to "reify" the baby, that is, act toward the infants as if they were "things" rather than persons they can interact with.

Women, by contrast, tend to *embrace* the mother role, submerging themselves in the role and trying to act more skillfully than they in fact feel. Role-embracing mothers deny that one cannot interact with a baby, pointing out that one must simply interact on a largely non-verbal level. Hence the new mothers quickly gain the sense that the infant has "interpersonal competence," while fathers by and large see no such competence and prefer to relate to an older child.

Were it the case that this gender difference in early parenting merely reflected the lesser opportunity men have earlier in life from sibcare or babysitting to learn the skills involved in handling an infant, one would predict that second-time fathers feel more comfortable and become more involved in the care of the second infant than the first. Shapiro's study (1979) does not confirm this expectation, however. Second-time fathers showed no effect of greater familiarity with babies: they were enamored with the growing abilities of their two and three year olds and left the new infant to the mother while they took over more of the care of the older child. Their wives encouraged this because they themselves felt more experienced in infant care by the second birth, and were pleased to have their husbands' help with the older child while they enjoyed the new infants.<sup>5</sup>

<sup>5</sup> Entwisle and Doering (1981) found that

Several general results emerge from the three types of research. For one, solo fathers, like solo and traditional mothers, experience social isolation, income loss and career restrictions as a consequence of primary responsibility for child care. Second, co-parenting of children in intact families, like solo fathering, tends to involve children beyond the toddler stage, rarely infants under 18 months of age. Third, solo parenting involves anxiety for the parents primarily where the opposite sex child is concerned, with problems of emotional deprivation of daughters for solo fathers, and disciplinary control of sons for solo mothers. Fourth, exclusive or high levels of paternal investment in childrearing yield an internal locus of control and cognitive growth in the child, while exclusive rearing by women restricts young children's environmental exploration and encourages emotional dependence. We do not know if children of solo mothers show greater empathy and social skills than children of solo fathers, since this has not been investigated, though there was a hint of this in Eiduson's Los Angeles study.

The consistency with which one finds low paternal involvement with very young infants, who can neither walk nor talk, is of particular interest. Experimental work on response to infants supports the view that the underlying psychophysiological responses to infants are similar in men and women, but their behavioral responses differ in a way consistent with role distancing in the male and role embracing in the female: women show approach behavior of a nurturant kind toward the infant, while men respond by ignoring or withdrawing from the infant (Frodi and Lamb, 1978). Lamb (1977) and Lamb and Goldberg (1982) have found that fathers differ in the *type* of interaction they engage in with children under a year of age: fathers hold babies to play with them, mothers to take care of and soothe them. Altogether, one may suggest that men tend to avoid high involvement in infant care because infants do not respond to their repertoire of skills, and men have difficulty acquiring the skills needed to comfort the infant.

What shows in this new research on parenting are gender differences of the same kind that emerge in psychological research: greater em-

pathy, affiliation, sensitivity to nonverbal cues and social skills in women, greater emphasis on skill mastery, autonomy and cognitive achievement in men. The other side of these generally desirable attributes is a tendency for men to feel discomfort with intimacy, and women with impersonal situations. Gilligan (1982), using TAT story-telling protocols varying in whether the central characters are in isolated, competitive situations or intimate relational situations, found that women perceive danger and project violence into impersonal achievement situations, while men perceive danger and project violence into close personal situations. Intimacy is threatening to the male, impersonality to the female. These results are consistent with the role distance in men and role embracement in women in relating to the newborn child, since infant care involves a high degree of physical and emotional intimacy.

Prior socialization no doubt presents difficulties to contemporary young adults who attempt co-parenting and solo fathering. They are negotiating new turf with few cultural guidelines and little social support. On the other hand, the fact that the same gender differences between solo mothers and solo fathers are found between men and women in intact families, and in general psychological research of the kind Gilligan and others have conducted, suggests there is more involved than a need to unlearn old habits and learn new ones specific to parenting. That the issue is not simply past socialization running against current ideological commitment is also suggested by developments on the Israeli kibbutzim in recent years. Spiro's (1980) 25-year follow-up on the kibbutz he first studied in the 1950s shows it is women in the *sabra* generation—born and reared totally under the collective childrearing of the kibbutz—who have pressed the hardest for greater contact with children, overnight visiting privileges for children, and more room for home-based family activities.<sup>6</sup>

Spiro concluded, against his earlier presuppositions as a cultural anthropologist, that "pre-cultural sex differences" must be at work, but he gives no detail on what he thinks those "pre-cultural" factors might be. Neither does

working-class men were less likely to assist in child care when they had had prior experience in caring for young children than when they had no such experience, which may reflect the ambivalence of working-class women who experience parenting as their major source of self-worth. This may encourage their keeping their husbands as "mother's helpers" rather than as a sharing partner in parenting, something easier to do when the husband has had no prior experience.

<sup>6</sup> There is great controversy in the interpretations given for the departure from sex equality on the kibbutzim (Palgi et al., 1983). Rae Lesser-Blumberg (1983:136) argues that women never had a real chance, since they were "integrated into 'male' economic and political roles, but there was no systematic attempt to integrate kibbutz men into 'female' roles." See also Blasi (1983) for another critical perspective on Spiro's argument that the shift back to traditionalism reflects the greater strength of "pre-cultural sex differences."



Gilligan propose any theory to explain *why* intimacy is threatening to men and impersonality to women: or *why* she finds women's mode of thinking to be contextual and narrative, while men's is formal, linear and abstract. She merely argues that theories of human development have used male lives as a norm and tried to fashion women out of a masculine cloth that does not fit.

Still another example of a lack of explanation of gender differences is found in studies demonstrating a sex-role inversion in the later years of the life span. It has been noted in a variety of studies that with age, men become less assertive, more tender and nurturant, while with age, women become more self-assured and assertive (Gutmann, 1964, 1969, 1975; Neugarten and Gutmann, 1968). The same massive involution of gender role with age was found in four very different societies, but the researchers have not proposed any biosocial or biopsychological mechanism through which this transformation takes place in the postparental years of life. The lack of explanatory specificity in all three examples—Spiro, Gilligan and Gutmann—is based on the entrenched but erroneous view that biology is properly left outside the ken of the social sciences.

#### EVOLUTIONARY PERSPECTIVE ON GENDER AND PARENTING

Parenting styles show the same gender differences found in other contexts than the family, which refutes the idea that there is something particular to pregnancy and birthing that "predisposes" or "triggers" maternal attachment to the newborn. It is not to a "maternal instinct" or "hormonal priming" at birth that one should look, but to gender differences that are in place long before a first pregnancy. This makes very dubious a view prevalent in the infant development literature in the last decade that close contact of the mother with her newborn during the first hours after birth, when hormonal levels are still very high, is important to subsequent mother-infant attachment. Lamb and Hwang's (1982) review of this literature concludes that the post-birth period is neither a critical nor a sensitive period<sup>7</sup> for maternal attachment.<sup>8</sup>

<sup>7</sup> A "critical" period refers to a discrete phase of development during which specific events *must* occur if development is to proceed normally, while a "sensitive" period refers to a phase of development during which an aspect of development may be *more readily* influenced than at other stages. Contact with the newborn in the hours after birth is neither a "must" in the critical period sense, nor even "facilitative" in the sensitive period sense.

<sup>8</sup> The best-known work in this area is that by

Indeed, a rethinking of this issue from an evolutionary perspective suggests it is highly unlikely that small variations in early contact could be critical to human attachment to infants. For a complex organism like a human being, fixing of an essential bond is not likely to be dependent on a brief period or specific experience following childbirth. There will be considerable redundancy in the processes that assure activation of parental attachment to a child, and this will take place over a considerably longer period than a few hours or days after birth.

Animal research shows that it is possible experimentally to invoke nurturant behavior toward the young through the administration of female sex hormones to virgin, prepubescent males and females, so some hormonal factors implicit in sex dimorphism are implicated (Moltz et al., 1970; Rosenblatt, 1967, 1969; Terkel and Rosenblatt, 1968). It is also the case that normal males show nurturant behavior if exposed to pups for a period of time. Adler (1973) suggests that hormones may *prime* nurturant behavior, but continuous proximity is necessary to *maintain* that behavior and may even stimulate it in the absence of hormonal priming.

For most primate species and most of human history, lactation assured the maintenance of proximity between mother and newborn. Then too, the mother-infant dyad is not isolated but enmeshed in a group, whether a baboon troop, hunter-gatherer band or contemporary family. Support by the group is enhanced by the general affiliative, socially responsive qualities of the female, since these qualities elicit aid from the group and assure persistence in providing nurturant care to the young by all the females in the group.<sup>9</sup>

Klaus and Kennell (1976), whose findings have not been replicated. Klaus and Kennell used poor young clinic patients, who may have been more affected by the projected model of good parenting behavior when they were marked off for special treatment by having more time with their newborn infants (Hawthorne effect). Studies with middle-class women at Stanford and in Sweden did not show any comparable effect of increased time with neonates for subsequent mother-infant attachment that Klaus and Kennell claim to have established. See Lamb and Hwang (1982) for a detailed critical review.

<sup>9</sup> Gender-differentiated persistence in seeking contact with the newborn is found among siblings in both monkey and human groups. In monkey groups, mothers often try to keep both male and female siblings away from the newborn, but pubescent females *persist* in seeking proximity while males do not (Suomi, 1982). Human toddlers show similar behavior, with girls seeking contact, while boys go off more readily when the mother is with a newborn (Dunn and Kendrick, 1982; Nadelman and Begun,

Thus an evolutionary perspective suggests not only that no specific experience will be critical for parental attachment to and care of the young. It also argues against the possibility of leaving to a late stage of development, close to or following a pregnancy, the acquisition of qualities necessary for so important a function as reproduction. The attributes of mothering and fathering are inherent parts of sex differentiation that paves the way to reproduction. This is where the sociological analogy so often drawn between race and sex breaks down in the most fundamental sense. Genetic assimilation is possible through interracial mating, and we can envisage a society that is color-blind. But genetic assimilation of male and female is impossible, and no society will be sex-blind. Except for a small minority, awareness of and attraction to differences between male and female are essential features of the species.

If the parenting styles of men and women build upon underlying features rooted in basic sexual dimorphism, then increased male involvement in primary care of the very young child will not have the effect that some theorists expect. For example, Chodorow (1974, 1978) argues that gender differences are themselves the consequence of the fact that it is women who do the parenting of both sons and daughters. By this thesis, if fathers had primary care responsibility for their same-sex child, boys, like girls today, would grow up with less individuation, greater relational affiliation, less clearly marked off ego boundaries.

But there is no evidence from the studies of solo or co-parenting fathers to date to suggest this is a likely outcome. Men bring their maleness to parenting, as women bring their femaleness. Hence the effect of increased male investment in primary care of sons is not to produce sons who would be more like daughters, but to either enhance gender differences, or if there is significant co-parenting, to enlarge the range of characteristics shown by both sons and daughters.

#### BIOLOGICAL COMPONENTS OF GENDER

It is one thing to criticize psychosocial theories for their inadequacy in explaining empirical findings on gender differences in parenting. It is quite another to supplement them with biological factors. Sociologists share enough ground in theory and method with psychologists to work readily across both disciplines.

1982). Ember (1973) found that helping to care for younger children increased nurturing and socially responsible behavior in boys.

This is not the case where biological contributions to gender differences are concerned. My treatment must be very selective, but it is nonetheless necessary to make a few general points.

One, it makes no sense to view biology and social experience as separate domains contesting for election as "primary causes." Biological processes unfold in a cultural context, and are themselves malleable, not stable and inevitable. So too, cultural processes take place within and through the biological organism; they do not take place in a biological vacuum.

Second, there is a good deal of ferment in the biological sciences these days in opposition to the Cartesian reductionism that has characterized western science for three centuries.<sup>10</sup> That model worked well in physics and chemistry and the technology they spawned. It has not worked well in embryology and the brain sciences. Reductionism in the biomedical fields works via the experimental mode in which one perturbs the normal working of the system under study, but as a consequence it runs the risk of confusing the nature of the perturbation with the cause of the system's normal functioning. An example from medical research illustrates this point: if you give patients the drug dopamine and it reduces Parkinsonian tremors, then Parkinson's disease is thought to be "caused" by a deficiency of dopamine (Lewontin, 1983). Sociobiologists rely on the same reductionist model: they consider properties of society to be determined by intrinsic properties of individual human beings; individuals in turn are expressions of their genes, and genes are self-replicating molecules. Following this logic leads to such claims as Dawkins's (1976) for a "selfish gene," others for an "altruistic gene." Under fire from social scientists, Edward Wilson has revised his earlier gene-determinist theory to include the evolution of culture itself, using the concept of "gene-culture coevolution" to explain the emergence of "mind" (Lumsden and Wilson, 1981, 1982). But the revised theory remains a reductionist theory.<sup>11</sup>

The challenge to the reductionist model has

<sup>10</sup> Two books of essays, from a 1980 conference in Bressanone, Italy, are a useful introduction to the dialectic perspective in biology (Rose, 1982a, 1982b). For a brief overview of the major ideas from this conference, see Lewontin's review of these books (Lewontin, 1983).

<sup>11</sup> See Gould (1983) for a review of Lumsden and Wilson's book, *Promethean Fire* (1982). A critical review of the companion volume, *Genes, Mind, Culture* (Lumsden and Wilson, 1981), can be found in Smith and Warre (1982).

come from biological scientists here and in western Europe, particularly among Marxist biologists, who argue in favor of a dialectical model. This is based on an interesting set of assumptions: one, organisms grow and change throughout their life spans through an interplay of biological, psychological and sociocultural processes (Parsons, 1982; Petersen, 1980; Riegel, 1976; Rose, 1982a, 1982b). Second, biological processes are assumed to have greater influence at some points in the life span than at others. For example, they are critical in fetal development, at puberty, during pregnancy, but less potent during latency or early middle age. Thus, for example, there are quite high correlations between testosterone level and aggression among young men, but no significant correlations among older men, since the latter's greater social maturation permits higher levels of impulse control (Persky et al., 1971). So too, Gutmann's theory of the parental imperative is illuminated by an awareness of the ebb and flow along the life span in the significance of hormonal processes: childbearing and -rearing take place during that phase of the life span with the greatest sex dimorphism in hormonal secretion and body morphology, and with very great pressure to perform in culturally specified ways in adult male and female roles. Along with the relaxation of social pressure from middle age on, there is also a change in body, a blurring of sexual and hormonal differences between men and women. It is the interaction of lowered inner hormonal pressures and lowered external social pressures, combined with psychologically coming to terms with a shortened life span, that I believe produces the sex-role involution noted in studies of personality in the later years.

In sum, organisms are not passive objects acted upon by internal genetic forces, as some sociobiologists claim, nor are they passive objects acted upon by external environmental forces, as some social scientists claim. Genes, organisms and environment interpenetrate and mutually determine each other. To discuss biological predispositions is to attempt a specification of biological processes, in the same way sociologists try to specify social processes. Awareness of *both* social and biological processes adds a synergistic increment to knowledge, knowledge that can then be used to provide the means for modification and change; they do not imply that we are locked into an unchangeable body or social system. *Ignorance of biological processes may doom efforts at social change to failure because we misidentify what the targets for change should be, and hence what our means should be to attain the change we desire.*

But for social scientists to specify what biological processes are relevant to the phenomena they study can easily lead to flimsy argument by selective analogy, of the aggressive-territorial-male-animal variety. One must adhere to some guidelines in exploring whether and in what specific way gender differences may be shaped by biological processes. The biological factors relevant to gender differences in social behavior will be located at some point on the chain of development that runs from genetic sex at conception (a female XX chromosome or a male XY chromosome), through gonadal differentiation during the first trimester of fetal development, to hormones produced by the gonads and related pituitary glands, to neural organization of the brain, and from there to social behavior.

We can study the effect of variation at any one of these points on the chain for subsequent social behavior of the organism. For example, a normal conceptus has two sex chromosomes (XX or XY), but occasionally may have three, either an extra X (XXY) or an extra Y (XYY). The Y chromosome is critical in gonadal differentiation of the male and the level of androgenic hormones the gonads produce. If androgens affect behavior, as they do, then we can see what social behavior and physical characteristics vary between, say, a normal XY male and an XYY male or an XXY male. Compared to a normal male, the XYY male, with his extra dose of maleness if you will, will be taller than average, more muscular, have more body hair, higher activity levels, more impulsivity, and more acute visual-spatial abilities. A male with an extra dose of femaleness, the XXY male with Klinefelter's Syndrome, is shorter and less muscular, has less body hair and smaller testicles, lower sexual arousability, and is more timid and passive in behavior than the average male. Family and social circumstances will obviously affect how and the extent to which the behavioral characteristics are shown, but we have identified a very specific and important biological component in the behavior of such males.

Sex hormones affect social behavior in one of two ways: they can have *direct* effects—what biologists call activational effects—or *indirect* effects—what biologists call inductive or organizational effects (Goy and McEwen, 1980; Hoyenga and Hoyenga, 1979). A direct effect means secretion level, hormone production rate or type of hormone is a *proximate* contributor to behavior. Think of the contrast in behavior of a 10-year-old and an 18-year-old male; one contributor to the different social behavior they show is androgens: the older boy will have on average an eight times higher level of androgen secretion than the younger (Ellis,

1982), and a good deal of the behavior of the two males is affected by that difference.

The indirect or organizational effect of sex hormones refers to the influence of hormones during the critical phase of neural development in the third trimester of pregnancy when the brain is undergoing rapid development and differentiation. Hormonal influence at this critical stage is important for gender differentiation, since brain cells acquire a "set" (like a thermostat setting), highly resistant to change after birth. It is this organizational effect of hormones on neural circuitry that led neuroscientists to speak of a "male" or a "female" brain at birth. Note too, that the amount of androgens circulating in a male fetus during the first trimester of pregnancy is the equivalent by body weight to four times the amount he will have from birth to approximately 10 years of age (Ellis, 1982). Hormones, then, have powerful effects during fetal development, go into a relatively quiescent period for the first decade of life, and then rapidly increase again during the second decade of life. To the extent that hormones affect behavior, it is simply not true that an absence of a gender difference in behavior at age 4 and the emergence of such a difference at 14 means the difference is culturally produced, because the adolescent's behavior is strongly influenced by the activational effects of sex hormones.

With these comments as background, we can specify the criteria for determining whether biology is involved in a gender difference in social behavior. Parsons (1982) suggests four such criteria and proposes that if two or more of them are met, there is strong evidence implicating biology in the observed gender difference. Slightly modified from those Parsons proposed,<sup>12</sup> the criteria are: (1) consistent correlations between social behavior and a physiological sex attribute (body morphology, sex chromosome type, hormonal type and secretion level, neural organization in the brain); (2) the pattern is found in infants and young children prior to major socialization influences, or the pattern emerges with the onset of puberty when body morphology and hormonal secretion change rapidly; (3) the pattern is stable across cultures; and (4) similar behavior is noted across species, particularly the higher primates most genetically similar to the human species.

Using these four criteria, sex dimorphism with biological contributions can be claimed in

four areas: (1) sensory sensitivity (sight, hearing, smell, touch) and body morphology; (2) aggression or more aptly, general activity level; (3) cognitive skills in spatial visualization, mathematical reasoning and to a lesser extent, verbal fluency; and (4) parenting behavior (Petersen, 1980).

Parenting as a sex-dimorphic pattern clearly meets two of the four criteria: in almost all cultures and most species, it is primarily a female responsibility to care for the young. In most cultures, siblings provide more caregiving to the very young than fathers do (Weisner, 1982; Whiting and Whiting, 1975). Paternal caregiving among nonhuman primates tends to be among New World monkeys who typically have multiple litters, unlike large apes and humans who typically have one infant at a time and a prolonged period of immature dependency (Redican, 1976).

Redican's review of the structural conditions that predict paternal involvement among nonhuman primates is remarkably similar to a comparable review by West and Konner (1976) of the conditions that predict human paternal involvement. For nonhuman primate males, paternal involvement is high when there is a monogamous social organization, and paternity is readily identifiable when males are not needed for the role of warrior-hunter and when females are permissive and encourage paternal caregiving. For human males, West and Konner observe that men take care of their children if they are sure they are the fathers, if they are not needed as warriors and hunters, if mothers contribute to food resources, and if male parenting is encouraged by women.

The structural conditions specified by Redican, West and Konner apply for the most part to modern societies. There are limits of course on confidence in paternity, but sharing of the economic provider role is increasingly the pattern and spills over to rising pressure from women for greater participation by their husbands in child care. We can assume, then, that structural conditions are ripe for higher levels of paternal involvement in the future. Two criteria remain at issue concerning biological implications: do the differences between male and female on hormones, sensory sensitivity, activity level or social and cognitive skills lead one to predict different styles of parenting on the part of men compared to women as they move toward greater co-parenting? It is my working hypothesis that all sexually dimorphic characteristics contribute to the species function of reproduction, and hence have persisted as biological predispositions across cultures and through historical time.

<sup>12</sup> I have expanded Parsons's criterion "1" from just hormones to the factors cited in the text, and modified criterion "2" by including pubertal change.

A profile of gender differences in sensory modalities reads like this:<sup>13</sup> females show greater sensitivity to touch, sound and odor; have greater fine motor coordination and finger dexterity. Sounds are judged to be twice as loud by women as men; women pick up nuances of voice and music more readily, and are six times more likely to sing in tune as men. The sense modality in which men show greater acuity than women is vision: men show greater sensitivity to light, responding more quickly to changes in light intensity than women do. At birth, females are four to six weeks more mature neurologically than males, which persists in their earlier acquisition of language, verbal fluency, and memory retention. Language disabilities like stuttering and dyslexia are several times more prevalent among males than females.

Gender differences in social and cognitive skills are also found: females are more sensitive to context, show greater skill in picking up peripheral information and process information faster; they are more attracted to human faces and respond to nuances of facial expression as they do to nuances of sound. Males are better at object manipulation in space, can rotate objects in their mind, read maps and perform in mazes better, and show a better sense of direction. Males are more rule-bound, less sensitive to situational nuance. Most of these differences meet the criterion of precultural influence in that they show up at very early ages. Male infants are more attracted to the movement of objects, females to the play of expression on human faces. Girl babies startle to sound more quickly than boy babies, and respond to the soothing effect of a human voice, while boys respond to physical contact and movement.

Viewed as a composite profile, there is some predisposition in the female to be responsive to people and sounds, an edge in receiving, interpreting and giving back communication. Males have an edge on finer differentiation of the physical world through better spatial visualization and physical object manipulation. The female combination of sensitivity to sound and face and rapid processing of peripheral information implies a quicker judgment of emotional nuance, a profile that carries a put-down tone when labelled "female intuition." It also suggests an easier connection between feelings and their expression in words among women. Spatial perception, good gross motor

control, visual acuity, and a more rigid division between emotional and cognitive responsivity combine in a counterpart profile of the male.

One ingenious study illustrates both the greater sound acuity of women and greater spatial perception ability of men. The test was simply to mentally search the alphabet for two types of capital letters: those with a curve in their shape like an "S," and those with a long "ee" sound like a "Z." As predicted, men were faster and made fewer errors than women on the letter *shape* task, while women were faster and more accurate on the verbal *sound* task (Coltheart et al., 1975).

When these gender differences are viewed in connection with caring for a nonverbal, fragile infant, then women have a head start in easier reading of an infant's facial expressions, smoothness of body motions, greater ease in handling a tiny creature with tactile gentleness and in soothing through a high, soft, rhythmic use of the voice. By contrast, men have tendencies more congenial to interaction with an older child, with whom rough-and-tumble physical play, physical coordination, teaching of object manipulation are easier and more congenial. Note, however, that these are general tendencies, many of them exaggerated through sex-differentiated socialization practices; they should not be taken to mean they are either biologically immutable or invariant across individuals or cultures. Some cultures may reinforce these predispositions, as ours does, while others may socialize against or reverse them.

There is, however, a good deal of evidence in animal and human research to support the view that sex hormones and sex differentiation in neurological organization of the brain contribute to these differences. Androgens have been the most intensively studied for their effects on spatial visualization, maze running, aggression and sexual behavior. Animals given androgen either neonatally or as adults show improvement in complex maze scores, while the administration of the female hormone, estrogen, depresses maze learning. Sons of diabetic mothers who were given estrogen during pregnancy show reduced spatial ability and more field dependence than control males. Turner's-syndrome women, genetic females with only one sex chromosome (XO type), do not develop ovaries and hence are deprived of fetal androgens, and they show poor spatial and numerical ability.

As noted earlier, hormones can operate in either an activational or organizational manner. There is evidence that certain of the gender differences cited above are not acquired after birth, when they could be the result of the interactive effect of both biological and social

<sup>13</sup> Several sources contribute to this overview profile: Durden-Smith and DeSimone, 1983; Gove and Carpenter, 1982; Hoyenga and Hoyenga, 1979; Parsons, 1980, 1982.

factors, but before birth, in the organization of the brain under the influence of gonadal hormones. Neuroscience research has established that the right hemisphere of the brain is dominant in emotions, facial recognition, music, visual tasks and identification of spatial relationships, while language skills are dominant in the left hemisphere of the brain (Kinsbourne, 1978; Goy and McEwen, 1980). Human males show more rigid separation of function between the two brain hemispheres, while the female brain is less lateralized, less tightly organized than the male. Thus the brains of 4-year-old girls show more advanced cell growth in the left, language-dominant hemisphere, boys in the right, spatial perception-dominant hemisphere.<sup>14</sup>

Anatomical research further established that a larger proportion of space in the right hemisphere is devoted to the visual-spatial function in males than females. McGuinness (1976) suggests that as a consequence males have more restricted verbal access to their emotions than females (Durden-Smith and DeSimone, 1983). Brain lateralization differences between men and women also suggest that one reason males show greater mathematical ability than females is that females approach mathematical problems through left hemisphere *verbal* means, while males rely more directly on right hemisphere *symbols*, which is a more efficient route to problem solving.

Until 1982, a prevalent interpretation for why and how gender differentiation in hemisphere organization occurs was linked to the earlier maturation of girls generally. Lateralization, beginning earlier in girls, might give them an advantage in verbal skills, while delayed lateralization gives males an advantage in spatial skills (Harris, 1978). This interpretation has been challenged by new research that found the divider between the brain hemispheres called the *corpus callosum* (a bundle of fibers that carries information between the two halves of the brain) was larger and more bulbous in females than in males, suggesting greater ease and frequency of communication between the two hemispheres in females (de LaCoste-Utamsing and Holloway, 1982; Durden-Smith and DeSimone, 1983).

If further research substantiates these findings, they do not mean we simply accept a gender difference in spatial visualization and

mathematical ability as immutable. A postindustrial society in which an increasing proportion of occupations rely on mathematical and spatial skills, coupled with these findings, can as readily lead to a shift in mathematical training of girls away from dealing narrowly with their assumed "math anxiety," to biofeedback training to encourage greater direct reliance on symbols rather than words in problem solving.

## CONCLUSION

Let us assume that the neurosciences continue to affirm what is a growing accumulation of evidence of biological processes that differentiate the sexes, and let us assume further that the social trend toward greater co-parenting continues in the future. What are the likely outcomes in gender characteristics of a future generation of children?

I take the research findings to mean that at birth the child brings gender predispositions that interact with gender differences in the parents, whose own differences reflect biological predispositions either reinforced or downplayed by adult socialization and role pressure. Biological predispositions in the child do not preclude their supplementation by psychological qualities of the parents or encouraged in the child by parents who do not themselves possess a given characteristic. Quite traditional parents encourage children to develop in ways they perceive to be useful when their children are adults, even when they themselves do not possess the qualities they encourage in their children. Differences between parents and children do not mean that parental influence is nil, nor that children have rebelled under peer pressure. The qualities in question may have been actively encouraged by the parent.

If you assume further, as I do, that there are many socially desirable attributes among traditional male and female traits, then an equal exposure of children to them from parents who both invest a great deal in caregiving could have the effect of encouraging more androgyny in the children. Several researchers have shown that cognitive ability and even scientific productivity is higher when subjects are neither strongly feminine nor strongly masculine, but possess in equal measure the socially desirable traits of both sexes. Spence and Helmreich (1978) show that when socially desirable attributes of men and women are measured, they vary independently of each other within each sex. In other words, masculine qualities and feminine qualities do not preclude each other in the same person, although that combination is still not prevalent in American society. Furthermore, those with the highest

<sup>14</sup> Male victims whose left brain hemispheres were affected by stroke or epileptic seizure show more language impairment during recovery than female victims, because of the much greater male reliance on the left hemisphere for language; female victims compensate by relying on their unimpaired right hemisphere.

levels of self-esteem and self-confidence were subjects *high on both sets* of attributes.

Spence and Helmreich used their masculinity-femininity scales in a study of established scientists that also included measures of work commitment, subject mastery, degree of overall competitiveness in work, and productivity. The measure of scientific productivity was an external criterion, the number of references to their subjects' publications in the Science Citation Index. They found that those scientists *high on both* the masculinity and the femininity scales were the *most* scientifically productive. Further analysis found the highest scientific attainment to be among those *high* in subject mastery and work commitment, and *lowest* in competitiveness, a profile that again combines traditionally feminine with masculine characteristics.

Productive labor in all sectors of the occupational system, and creativity in critical professions, may therefore benefit by a blending of the attributes traditionally associated with male and female. That blending may be encouraged by movement away from sex-segregated occupations with token minority representation of one sex, toward compositional sex parity, on the assumption of an eventual reciprocal influence on each other of equal numbers of men and women incumbents.

But in the long run, on an individual as well as societal level, the socially desirable attributes of both sexes can be acquired by each sex only if we properly identify their sources in both biology and culture. Biological predispositions make certain things easier for one sex to learn than the other; knowing this in advance would permit a specification of how to provide compensatory training for each sex, in rearing children within families, in teaching children in schools, or in training adults on the job. No individual and no society can benefit from a circumstance in which men fear intimacy and women fear impersonality.

As adults, there are limits on the extent to which we can change our deeply engrained characteristics. But a first step is to understand and to respect the qualities of each sex, and to actively encourage children to absorb the socially desirable attributes of both sexes. To the extent this is done, whether by solo fathers, solo mothers, or egalitarian co-parents, a future generation of boys and men may temper competitive self-interest with affiliative concern for the welfare of others and skills in intimate relations, and girls and women may temper their affiliative concern for others with a sense of effective, actualized selves.

No society on this tiny planet provides a model for us to emulate. It was my hope in recent years that feminism provided a guide to

such a future, as it had been earlier that socialism did. But neither Marxism nor feminism, to say nothing of mainstream social science, has yet taken up the challenge of the biological component to human behavior, despite the fact that sex dimorphism is central to both production and reproduction. An ideology that does not confront this basic issue is an exercise in wishful thinking, and a social science that does not confront it is sterile. Whether one's motivation as a sociologist is rooted in passionate commitment to social change or passionate commitment to scientific advance, or both, it is my firm conviction, and conclusion, that the goals we seek are best approached through an integrated biosocial science.

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## COMPARATIVE SOCIAL MOBILITY REVISITED: MODELS OF CONVERGENCE AND DIVERGENCE IN 16 COUNTRIES\*

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*This paper reanalyzes 3-stratum intergenerational mobility classifications, assembled by Hazelrigg and Garnier for men in 16 countries in the 1960s and 1970s. Log-linear and log-multiplicative models are used to compare mobility regimes and to estimate effects of industrialization, educational enrollment, social democracy, and income inequality on immobility and other parameters of the mobility process. Several models of mobility fit the data equally well, so criteria of plausibility and parsimony are applied to choose one model of stratum-specific immobility and another model of vertical mobility with uniform immobility. We find substantial similarity in mobility and immobility across countries, but the exogenous variables do explain systematic differences among countries. Cross-national variations are complex because most of the exogenous variables have different effects on different parameters of the mobility regime. Relative to other factors, industrialization and education have weaker effects on mobility regimes than has usually been supposed.*

Three issues have dominated comparative studies of social mobility.<sup>1</sup> The starting point for most research is the thesis advanced by

Lipset and Zetterberg (1959) that observed mobility rates are much the same in Western industrialized societies. However, more recent and detailed data lend little support for this position (Hauser and Featherman, 1977; Erikson et al., 1979; Hope, 1982). Featherman et al. (1975) suggested that variation in observed mobility rates might derive from historical and cultural differences in occupational structures, but not from differences in exchanges between occupations. This hypothesis, labelled the FJH revision by Erikson et al., leads to the prediction that mobility chances are invariant once variations in origin and destination distributions have been controlled. Although the FJH revision has been supported by pairwise or three-way comparisons (Erikson et al., 1982; McRoberts and Selbee, 1981; Hope, 1982; Portocarero, 1983; Hauser, 1983), research with a larger sample of countries has tended to emphasize cross-national variability (Tyree et al., 1979; Hazelrigg and Garnier, 1976; McClendon, 1980a).<sup>2</sup> There is also some dis-

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<sup>1</sup> Matras (1980) and Simkus (1981a) have recently reviewed comparative mobility studies.

<sup>2</sup> Of course, there is an element of subjectivity in any evaluation of the FJH revision; it is unclear how much similarity in mobility regimes is necessary to confirm the hypothesis.