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Behavioral Sex Differences in Children of Diverse Cultures: The Case of Nurturance to Infants

CAROLYN POPE EDWARDS

A radical reconceptualization of sex-role development is taking place in the field of developmental psychology today (Maccoby 1988; Jacklin 1988). This restructuring involves both theoretical and empirical transformations. The theoretical aspect includes efforts to integrate social learning and cognitivist perspectives through a focus on self-socialization, which can be defined as the process whereby children influence the direction and outcomes of their development through selective attention, imitation, and participation in particular activities and modalities of interaction that function as key contexts of socialization. The empirical transformations involve a renewed focus on context. Whereas earlier studies of behavioral sex differences typically involved appraising individual behavioral dispositions across contexts, the new approach seeks ways to understand behavior within specific dyadic and activity settings.

The goals of earlier work were to understand how, why, and at what age girls and boys begin to vary behaviorally along such dimensions as "nurturance," "aggression," and "dependency," including determination of how sex-typical dispositions are influenced by cultural factors (exemplified by Maccoby & Jacklin 1974, and our early analyses of sex differences in children's behavior, in Whiting & Edwards 1973). In contrast, the new approach seeks to under-

stand (1) how different kinds of social behavior are elicited by different contexts of socialization (defined by the sex, age, status, and kinship of social interactants, ongoing activities, and other potent dimensions of setting); (2) how these contexts of socialization are distributed across cultures and associated with various adult subsistence strategies, family structures, household patterns, and forms of social networks; and (3) how boys and girls of each age in diverse cultures come to occupy different contexts of socialization.

Definite answers have yet to emerge on the causal mechanisms and processes in the ontogeny of sex differences. Instead, we remain at the preliminary stage of collecting a solid corpus of descriptive data. The data serve to show how sex, age, and cultural differences in children's interpersonal behavior are related to daily routines, including modes of subsistence, parental division of labor, household living arrangements, and social networks for work and leisure. These data closely parallel those data sought in current studies of nonhuman primates, where sex, age, and species differences in interpersonal behavior are studied in relation to sex-typical life-history strategies (as defined by patterns of dispersal and ranging, lifetime group membership, modes of sexual selection and parenting, and modes of achieving and maintaining group status).

COMPARATIVE SOCIOECOLOGY OF CHILDHOOD

In the remainder of this chapter, I attempt to illustrate the kinds of insights being achieved in cross-cultural studies of children's sex-typed behavior, and to show what kinds of comparisons can be drawn to findings on juvenile nonhuman primates. I focus on one dimension of interpersonal behavior—children's interaction with infants—as exemplary of the problem domain.

Only in recent years has alloparenting behavior received systematic study in either humans or nonhuman primates. Among the nonhuman primates, allomothering by nonparents, normally close kin, is common. The degree to which mothers permit it varies within and among species, however, as does the degree of interest in infants by nonparent animals (Hrdy 1976; McKenna 1987; Fairbanks 1990). Among the New World monkeys (Callitrichidae), where multiple births are common, both fathers and immature siblings play a prominent role in infant care. In red-bellied tamarins, for example, siblings and fathers compete with mothers to carry infants during the infants' first month of life (Pryce 1988). Among Old World monkeys, in contrast, the pattern of allomothering varies greatly across species. Extensive "aunting" by immature females has been described for a number of species, especially langurs and vervets, whereas free-living adult males may provide protection from predators or hostile monkeys but rarely carry or baby-sit infants (Redican & Taub 1981; Snowden & Suomi 1982).

THE CHILDREN OF DIFFERENT WORLDS STUDY

Method

The findings on child caretaking to be described come from our recent study, *Children of Different Worlds: The Formation of Social Behavior* (Whiting & Edwards 1988). The book is based on New Sample data collected from 1965 to 1975 by 10 collaborators and ourselves, as well as on data reanalyzed from the 1954–1956 Six Cultures Study (Whiting & Whiting 1975). The majority of the sample communities were traditionally part of tribal societies with subsistence based on horticulture and/or pastoralism ("middle-level" societies). The others were part of complex, stratified societies with economies based on intensive cultivation and/or industry. None was a hunter-gatherer group. Middle-level

societies normally make greatest use of children as infant caretakers, while the percentage of societies using child caretakers is smaller for hunters, gatherers, and fishers than for other subsistence types (Konner 1975).

The six New Sample communities, together with the Six Cultures, were located in the nations of Kenya (five communities), India (two communities), Liberia, Okinawa, the Philippines, Mexico, and the United States (one community each) (Table 22.1). In each of these communities, a sample of between 16 and 104 children aged 2 to 10 years old was selected for timed observation using Focal-Subject Sampling (see Altmann 1974). Behavior was recorded as written running records by trained members of the children's culture. In recording the focal child's social acts (event sampling), the observer followed the eyes of the focal child, identifying whenever possible not only the child's social interacts but also the event that invoked it and any response by a social partner. The records were taken in consecutive English sentences, for later coding. Behavior coding involved judgment of the apparent intention, which often could be made only when the entire sequence of events was known. Before an observation was started, the date, time of day, exact location, people present, and activities in progress were recorded. Time records were maintained along the left-hand margin of the paper, with notes as to when people entered or left the interactional space. With the exception of Bhubaneswar, India, observations were limited to the daylight hours and were distributed over four or five periods of the day. In the Six Culture Study, each record was 5 minutes in length; in the New Samples, they were 15 minutes to 1 hour in length, depending on the community. Methods of training observers and achieving interobserver reliability were roughly the same across communities.

In coding social events, we categorized each interact as a type of *mand*, defined as an attempt on the part of an individual to change the behavior of the social partner (Whiting 1980). We used six major categories of mands, each with subcategories: *ego dependent* (seeking comfort, physical contact, help, information, approval, food, other material goods, or permission); *ego dominant* (seeking to injure, annoy, insult, dominate, compete, or escape); *nurturant* (offering comfort, physical contact, help, information,

Table 22.1. Sample Communities in Which Behavior Records for Focal Children Were Collected

Location	Field researcher	Years of field work	Sample
Kien-taa, Liberia	Gerald Erchak	1970-1971	15 households; 20 children aged 1-6 (360 minutes of observation per child)
Kokwet, Kenya	Sara Harkness Charles Super	1972-1975	64 children aged 3-10 (120 minutes of observation per child)
Kisa and Kario-bangi, Kenya	Thomas Weisner	1970-1972	24 urban and rural families matched by age, education, and kinship ties; 68 children aged 2-8 (120 minutes of observation per child)
Ngeca, Kenya	Beatrice Whiting	1968-1970, 1973	42 homesteads; 104 children aged 2-10 (45-300 minutes of observation per child)
Bubaneswar, India (state of Orissa)	Susan Seymour	1965-1967	24 households (8 upper, 8 middle, 8 lower class); 103 children aged 0-10 (16 hours of observation per household)
Nyansongo, Kenya	Robert Levine Barbara LeVine Lloyd	1955-1956	18 homesteads; 16 children aged 3-10 (75 minutes of observation per child)
Juxtlahuaca, Mexico	A. K. Romney Romaine Romney	1954-1956	22 households; 22 children aged 3-10 (79 minutes of observation per child)
Tarong, Philippines	William Nydegger Corinne Nydegger	1954-1955	24 households; 24 children aged 3-10 (135 minutes of observation per child)
Taira, Okinawa	Thomas Maretzki Hatsumi Maretzki	1954-1955	24 households; 24 children aged 3-10 (74 minutes of observation per child)
Khalapur, India*	Leigh Minturn	1954-1955	24 households; 24 children aged 3-10 (95 minutes of observation per child)
Orchard Town, U.S.	John Fischer Ann Fischer	1954-1955	24 households; 24 children aged 3-10 (82 minutes of observation per child)

*Minturn returned to Khalapur in 1974-1975. The data used in this volume do not include the restudy.

Source: Whiting and Edwards (1988, p. 19).

approval, food, other material goods, or permission); *prosocial* (commanding an economic, a household, or a childcare chore, commanding hygiene or etiquette, reprimanding another's behavior); *sociable* (seeking or offering friendly response, including social play, laughing together, talking together, verbal or physical teasing, or horseplay); and *teaching* (offering general information, abstract knowledge, or information about skills necessary for a chore). After coding the interacts, the frequency totals were converted into proportion scores (proportion of all coded social acts by an actor or a category of actors).

A brief description of the sample communities is warranted. Nine of the 12 were rural peasant economies. A generation or two previously, the members of these communities had produced their own food through horticulture and animal husbandry, but by the time of study, the people had become involved in some cash cropping or wage work to buy products of the industrial world. The other three communities were urban; men worked as wage earners, entrepreneurs, or professionals. Women's work-

loads varied greatly, with the heaviest in rural Kenya, where mothers desired many children and also performed heavy farm and household work. Settlement patterns of the communities varied from those composed of large farms, to hamlets, villages, large towns, and parts of cities. Average household size was smallest in the United States community of Orchard Town, New England, with three children per family, and largest in the Kenyan and North Indian samples, where 7-10 children were usual. Kin availability was greatest in the rural polygynous Kenyan households, which included as many as eight separate dwelling units. Kin availability was also high in many other samples, where relatives lived on contiguous or nearby land. Most isolated from kinfolk were the apartment dwellers of Kariobangi (a housing estate in Nairobi, Kenya) and the Americans in suburban Orchard Town.

In addition to these data, Whiting and Edwards (1988) report data collected under the direction of Ruth and Robert Munroe using a form of Instantaneous Sampling (Altmann 1977 called Spot Observation (Rogoff 1978; Munn-

Table 22.2. Sample Communities for Which Instantaneous Behavior Samples (Spot Observations) Were Collected

Location	Field researcher	Dates	Subject
Nyansongo (Gusii), Western Province, Kenya	Sara Nerlove	1967	10 girls, 12 boys
Vihiga (Logoli), Western Province, Kenya	Ruth Munroe	1967	8 girls, 8 boys
Ngeca (Kikuyu), Central Province, Kenya	Robert L. Munroe	1970-1971	12 girls, 9 boys
	Ruth Munroe		
Conacaste and Santo Domingo, Guatemala	Sara Nerlove	1971	28 girls, 25 boys
Santa Barbara (Canchitos), Peru	Charlene Bolton	1974	5 girls, 6 boys
	Ralph Bolton		
	Carol Michelson		
Claremont, California, U.S.	Amy Koel	1975	7 girls, 10 boys

Source: Whiting and Edwards (1988, p. 43).

et al. 1984). On designated days, and at set time periods during the day, the observer visited all the sample homesteads in turn and scored one set of records per subject child: proximity to home; predominant activity; sex, age, relatedness, proximity, and activity of all persons present in the child's interactional space; persons' social engagement with the subject; and whether the subject was being supervised by an authority figure. By this method, a total of 140 children aged 5-7 years old were studied during the years 1967 to 1975 in six sample communities located in Kenya, Guatemala, Peru, and the United States (Table 22.2).

Sex Differences in Children's Behavior

One of our main findings was that it is far easier to describe sex, age, and cultural differences in children's typical companions and activities than to find differences in their social behavior (relative proportions of nurturance, dominance, dependence, and sociability) after controlling for companions and activities. These findings were consistent across cultures.

1. Girls spend more of their day doing responsible or productive work, such as childcare, housework, and gardening; boys spend relatively more of their time in undirected activity or play, and these sex differences are seen from age 3 onward.
2. Sex segregation is the grand rule of social interaction during middle childhood (age 6-10): boys and girls segregate into same-sex peer groups whenever there are enough children available, and especially do so when they have already divided themselves into

age-homogeneous groupings (for extensive discussion, see Maccoby 1988).

3. During middle childhood, boys reduce contact and interaction with their mothers and other adult females, and are observed at greater distances from home than are girls.
4. Girls have more contact and interaction with, and responsibility for, infants than do boys.

Girls' greater contact and interaction with infants was, perhaps, the most consistent behavioral sex difference we documented. In re-analyzing the Six Culture data for children 5-10 years old, and the Spot Observation data for children aged 5-7 (Table 22.3), we found that in 10 of the 12 samples girls were observed more

Table 22.3. Children's Involvement in Infant Care

Community	Girls (%)	Boys (%)	Difference
Six cultures*			
Nyansongo	32(5)	22(4)	+10
Juxtlahuaca	13(7)	6(8)	+7
Tarong	9(3)	9(3)	0
Taira	15(7)	6(3)	+9
Khalapur	9(7)	1(4)	+8
Orchard Town	10(1)	0(1)	+10
Spot observations*			
Nyansongo	14	7	+7
Vihiga	10	1	+9
Ngeca	7	3	+4
Conacaste/Santo Domingo	3	1	+2
Santa Barbara	6	0	+6
Claremont	0	0	0

*Percentage of observations in which children aged 5 and over (who have a sibling) are responsible for the infant sibling (the number of children with 1- to 18-month-old siblings are given in parentheses).

*Percentage of observations in which children aged 5-7 are holding an infant (1-18 months).

Source: Adapted from Whiting and Edwards (1988, p. 73).

often than boys taking care of infant siblings, and in the remaining two samples girls' and boys' scores were equal (sign test, $p < 0.001$, two-tailed).

Children's involvement in infant care was positively related to mothers' workload (see also Blurton Jones, Chapter 21, this volume). A rank ordering of the Six Cultures mothers' workload, based on ethnographic descriptions, is as follows from highest to lowest: Nyansongo, Tarong and Juxtlahuaca (approximately equal), Taira, Khalapur, and Orchard Town (Whiting & Whiting 1975, pp. 110-113). The rank ordering of children's involvement in infant care is Nyansongo, Taira, Juxtlahuaca, Tarong, Khalapur, and Orchard Town (Table 22.3). The correlation of these two rank orders approaches significance (Spearman $\rho = 0.81$). In the Spot Observation communities, similarly, both maternal workloads and child infant tending were highest in the Kenyan samples and lowest in suburban Claremont, California. Furthermore, Munroe et al. (1984) report Spot Observation data from four cultural communities showing a strong relationship of children's childcare and subsistence workloads to mothers', but not fathers', total workloads.

Whiting and Edwards (1988) also report the more detailed findings of our collaborators after the Six Culture study, and these findings strongly confirm the sex difference in children's involvement with infants. Seymour's (1988) discussion of her findings for Bhubaneswar, North India, is particularly interesting because she also demonstrated the interaction of maternal workload and child sex (mediated by family status) in determining the amount of responsibility assigned to children. She conducted timed observations in 24 households (all with infants) containing 43 children aged 6-10 years. In middle- and upper-status families, childcare responsibility was negligible for boys and low for girls. In lower-status families, however, where the mothers worked outside the household, girls cared for, assisted, and disciplined their infant siblings almost four times more frequently than did brothers and six times more frequently than did the middle- and upper-status girls. In Bhubaneswar, mothers of all status groups considered it undesirable to involve sons in childcare; therefore, in the lower-status homes, daughters bore the load of assisting their mothers.

Harkness (1975) conducted spot observations

in Kokwet, a rural Kipsigis farming community in western Kenya. The observations made of children's companions and activities were randomized over three periods of the day and indicate that girls aged 2-6 years tended babies in 9% of their observations, versus 1% for the boys. Similarly, girls aged 7-14 were observed tending babies in 8% of observations, versus 3% for boys.

Sieley (1975) made spot observations in Kipileji, the community adjacent to Kokwet, where she collected home observations on each of 58 children aged 6-7 years and 47 children aged 10-11. In the younger age group, 52% of the girls versus 17% of the boys were observed at least once caring for, entertaining, or protecting a baby [$\chi^2(1) = 7.63$, $p < 0.01$]. In the older age group, the differences were less, with 60% of the girls observed caring for babies versus 35% of the boys [$\chi^2(1) = 2.65$, nonsignificant].

Wenger (1983, 1989) conducted 1328 spot observations on 105 children aged 2-11 years in a rural Giriama community near Mombasa, Kenya. She found that work was the activity that increased most sharply with age and differentiated the sexes. After age 8, girls' time was heavily structured to serve the needs of the household as a productive and reproductive unit, whereas boys gained new freedom to roam away from the home compound. At age 8-11, girls were observed supervising or caring for an infant or a toddler in 8% of their observations, versus less than 1% for boys. Furthermore, in observing focal children, observers noted whether an infant (18 months or younger) was present in the focal child's interactional space. Infants were present in the interactional space of girls more than boys at all ages (2-3 year olds: girls 18% of observations, boys 11%; 4-5 year olds: girls 21%, boys 13%; 6-7 year olds: girls 22%, boys 19%; 8-11 year olds: girls 27%, boys 5%).

Clearly, girls perform more infant care and are more involved with infants than boys in many subsistence-based societies in which busy mothers recruit help from older children. Because children under age 5-6 are not usually considered mature enough to care for infants, the sex difference appears at about that age and increases over the middle-childhood years.

Children's involvement in infant care bears no consistent relationship to fathers'. Concerning the Six Cultures communities, for example, an approximate ranking of fathers' involvement

with infants and toddlers puts Tarong first, Jutlahuaca second, Orchard Town and Taira in the middle, and Khalapur and Nyansongo lowest (Whiting & Edwards 1988). This ranking is orthogonal to that of children (and also boys, considered separately; Table 22.3). In the Spot Observation samples, a similar approximate ranking places Claremont first, the three Kenyan communities last, and the Latin American communities in between—a ranking negatively associated with that of the children (Table 22.3).

In our sub-Saharan African communities, fathers traditionally had little contact with infants, whereas children (including boys) cared for or supervised infants and toddlers. Husbands and wives often ate, slept, and socialized separately. Young boys prior to initiation spent much more time with mothers than fathers and helped with all kinds of tasks defined as feminine, especially when families lacked daughters (Ember 1973). Even in more modern times, these patterns have endured. Indeed, in all our Kenyan rural communities, boys prior to the age of initiation were involved with infants: in Kien-taa, Kokwet, Kisa, Kariobangi, and Ngecha, 17% of boys aged 4–10 years old versus 34% of girls were observed interacting with an infant (Whiting & Edwards 1988, Appendix D).

It is interesting to compare these Kenyan findings with those from other societies. Katz and Konner (1981) reviewed the role of the father cross-culturally and found that fathers' involvement with infants depended on subsistence adaptation, family organization, and general cultural definitions of male and female. Using Barry and Paxson's (1971) scales on 186 historically and linguistically independent cultures of all subsistence types, Katz and Konner found that fathers were more likely to be rated as "close" versus "distant" to infants in societies whose primary mode of subsistence was gathering, fishing, shifting agriculture, or horticulture, as opposed to hunting, herding, or advanced agriculture [$\chi^2(6) = 17.9, p < 0.01$]. They also found that fathers were more likely to be rated as close in societies that did *not* combine polygyny, patrilocal residence, and the extended family type of organization [$\chi^2(1) = 7.67, p < 0.01$].

Konner (1976) reports ethnographic field work among a traditional Kalahari !Kung group in which foraging was still the mode of subsistence, where women gathered much of the fami-

ly's food on long hikes into the desert and fathers were intimately involved in domestic life. Men held and played with their babies around the camp but left routine caregiving to the women. Children were little involved in responsible work of any kind, including childcare. Konner collected 15-minute observations (6 per age-point per infant) for infants aged 1–94 weeks. Counting any sort of participation by older children in the course of an infant observation, Konner found that girls played more with infants of all ages and both sexes than did boys. (In addition, girls were more involved with girl infants and boys with boy infants.) Thus although there was no formal use of children as infant nurses, !Kung girls interacted with infants more than did boys. Girls preferred to spend time in camp near adults and little children, whereas boys spent more time playing outside the village (Draper 1975).

Blurton Jones (Chapter 21, this volume) discusses child-rearing strategies in a contrasting group of foragers, the Hadza of Tanzania. He claims that children do little formal childcare, but that children of either sex may be asked to hold a protesting toddler as the mother leaves camp to go foraging and that girls who accompany women are likely to be asked to carry or entertain an infant or a toddler.

Draper and Cashdan (1988) studied hunter-gatherers in transition; they compared nomadic foraging !Kung with nonnomadic !Kung who had recently come to settle near permanent water resources to tend goats and donkeys and to raise crops. The move from a technologically simple to a more complex mode of production was associated with more hierarchical authority patterns, increased sexual division of labor, greater use of child labor, and greater differentiation among individuals. In the settled !Kung context, mothers engaged in intensive subsistence activity within the village, and their daughters (near at hand) became ready targets for heightened requests to do chores and run errands. As a consequence, the behavior of sedentary !Kung children was much more sex differentiated than the behavior of comparable bush children. Draper (1975) reports on 55 hours of elapsed-time observations on 38 focal children aged 2 to 14. Children aged 2 to 6 were observed to do virtually no childrearing acts whether their parents were nomadic or sedentary. However, this changed at age 7–14, es-

pecially for the sedentary girls whose mothers drew them into domestic work. The average number of childrearing acts performed per hour were bush boys, 2; bush girls, 1; sedentary boys, 0.4; and sedentary girls, 5.3.

PROBING FOR CAUSES AND CONSEQUENCES

What explains such consistent results? There are two major, mutually compatible hypotheses, with evidence for each. First, there is appreciable evidence of socialization pressure. Girls are often preferentially assigned to care for infants because mothers think girls make better caregivers or want to train girls for their future mothering roles. In the rural Kenyan communities, for example, mothers prefer to use daughters or nieces aged 6–8 as “child nurses,” but will use sons of similar age if no girls are available (Ember 1973). In a classic cross-cultural study, Barry et al. (1957) rated published ethnographies for degree of socialization pressure received by boys and girls in different domains. Ratings of “pressure toward nurturance” were judged largely by ethnographic statements about the assignment of childcare, and the results indicated greater pressure toward nurturance for girls than boys in 82% of 33 societies.

There is also considerable evidence of self-socialization, a process whereby children's own choices of models for imitation or identification and of preferred social companions, settings, and activities influence their developing behavior. Thus one avenue of self-socialization regarding interaction with infants involves sex-role identification: as children gradually develop concepts of “masculinity” and “femininity,” and understand to which group they belong, they attempt to match their behavior to their conceptions (Maccoby & Jacklin 1974; Maccoby 1990). They identify with one or more adults of their sex and selectively attend to and imitate same-sex models. Because in every society mothers are more involved in infant care than are fathers, we would hypothesize that sex-role identification would lead girls to seek infant-caretaking opportunities and boys to ignore or resist them.

Our evidence for this hypothesis is not as direct as would be desirable but does indicate that

girls are more cooperative with mothers' pro-social commands (including commands involving child care) starting as young as age 2–3 years (Table 22.4). We examined age and sex differences in percentages of children's compliance to maternal commands or suggestions in 12 cultural samples. “Compliance” was defined as either immediate or shortly delayed obedience. In some cultures, the sex difference was significant, and across the 28 comparisons girls were more cooperative or compliant in 20, boys in 7, with one tie (sign test $z = 2.31$, $p < 0.05$, two-tailed). Girls' more rapidly developing language skills and empathy toward others (Hoffman 1977; Fischer & Lazerson 1984) could contribute, along with processes of sex-role identification, to girls' greater cooperation with mothers' commands; nevertheless, it is our sense of the data that boys were less involved with mothers' work goals than were girls and that around age 4–5 they began to avoid their mothers and resist maternal authority (see Whiting & Edwards 1988 for observations).

A second important avenue for self-socialization involves children's preferred partners or styles of interaction. Thus girls may be more attracted to infants or mother–infant dyads than are boys, and/or they may prefer nurturant modes of interaction. Only the first of these has been directly studied in either children or the nonhuman primates, although many studies of children's fantasy play show girls from an early age preferring to act out family dramas involving themes of nurturance, whereas boys prefer role play involving monsters, animals, or superheroes focused on themes of dominance and aggression (e.g., Spiro 1980; Pitcher & Schultz 1983). In most nonhuman primate species yet studied, juvenile females more often associate with adult females and exhibit greater interest in neonates and young infants than do males (Pereira & Altman 1985; Pereira 1988a; Fairbanks, Chapter 15, this volume).

Sex differences in children's interest in infants have been studied by a number of American investigators but with an emphasis on children's responses to unfamiliar infants, outside a family context (Fogel & Melson 1986). In a series of studies, Berman and her associates (Berman 1986) found that during both early and middle childhood boys and girls approach and respond positively to unfamiliar infants and toddlers. During the preschool years, sex dif-

Table 22.4. Percentage of Children's "Total Compliance" (Immediate or Delayed) to Mothers' Prosocial Commands and Reprimands (A) and to Mothers' Instigations (of Any Type) (B)

[A] Community (New Samples) ^a	Age 2-3 years			Age 4-5 years			Age 6-8 years		
	Girls (%)	Boys (%)	Difference	Girls (%)	Boys (%)	Difference	Girls (%)	Boys (%)	Difference
Kien-taa	70	[73]	-3	89	83	+6			
Kokwet	91	75	+16*	84	84	0	96	89	+7
Kisa	83	62	+21	91	83	+8	83	76	+7
Kariobangi	76	95	-19	87	76	+11	86	[92]	-6
Ngeca	81	70	+11*	86	84	+2	96	92	+4*
Bhubaneswar, lower class	62	67	-5		68		77	62	+15
Bhubaneswar, middle and upper classes	57	53	+4	63	50	+13	78	58	+20

[B] Community (Six Cultures) ^b	Age 3-6 years			Age 7-10 years		
	Girls (%)	Boys (%)	Difference	Girls (%)	Boys (%)	Difference
Nyansongo	71	53	+18	63	45	+18*
Juxtahuaca	69	79	-10	78	[44]	+34**
Tarong	68	48	+20**	77	61	+16*
Khalapur	51	60	-9	67	50	+17
Orchard Town	48	53	-5	76		

Note: All tests of significance are based on ϕ tests, derived from χ^2 . Tests are two-tailed: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, **** $p < 0.001$.
^aKien-taa (girls and boys 6-8) and Bhubaneswar Lower Class (girls aged 4-5) have been omitted because they were based on one child-mother dyad only. Scores from Kien-taa (boys 2-3) and Kariobangi (boys 6-8) have been placed in brackets because they were each based on two child-mother dyads only.

^bTaira (all subgroups) and Orchard (boys 7-10) have been omitted because there were too few acts. The score from Juxtahuaca (boys aged 7-10) has been placed in brackets because it was based on fewer than 10 child-mother acts.

Source: Adapted from Whiting and Edwards (1988, p. 151).

ferences in attraction to infants are not clearly evident. However, strong sex differences appear around age 5, at which time children enact stereotyped "parental scripts" based on perceived adult masculine and feminine roles. Thus American boys become watchful and protective but generally passive toward babies unless the babies need direct instrumental help, whereas girls become highly interactive and nurturant.

In one study conducted in a day-care center, older (4.5-5.5 years) and younger (3.5-4.5) boys and girls were compared in spontaneous play with a young toddler and then when explicitly asked to look after the child (Berman & Goodman 1984). Sex and age differences emerged only after the caretaking request. Then, older girls interacted most (and with the most varied and nurturant styles), older boys interacted least, and younger girls and boys at an intermediate level. In another study (Reid et al. 1989), girls and boys aged 4-6 years were asked to pose for a photograph with an infant. Girls smiled, touched, and stood closer to the baby than did boys, but the differences were strongest when children were specifically directed to act

as the baby's Mommy or Daddy. Remarkably, the command to pose as parent caused boys to move farther away, whereas it caused girls to move closer. These responses were independent, because each child was individually tested.

Overall, American psychologists suggest differences in style of responsiveness rather than basic attraction toward infants. They argue that adult socialization and children's own identification with same-sex adults together foster the development of the sex difference in responsiveness during middle childhood. Do the cross-cultural data also show a sex difference in children's style of interacting with infants?

The data in Whiting and Edwards (1988) are useful in providing a close look at settings where large families and kin-centered life-styles offer both boys and girls opportunities to interact with infants and toddlers. We examined the question by comparing the proportions of boys' and girls' (aged 4-10 years) social acts to infants that were nurturant (defined earlier) in eight communities for which enough data were available. Six were located in Kenya. In the other sample commu-

nities, boys interacted with infants too seldom to compare their relative nurturance. (Girls aged 3–11 exceeded boys in percentage of aggregated social acts made to infants in each of the Six Cultures, sign test, $p < 0.05$; Whiting & Whiting 1975, Table 19.)

The girls' mean nurturance was higher than the boys' in six of the eight samples (Table 22.5; two-tailed Wilcoxon matched-pairs signed-ranks test, $W = 30$, $p < 0.04$), and perusal of the observations indicated that girls took greater interest and pleasure in caring for infants. Boys, although fully competent, were eager to leave their charges and play with peers, often in a rambunctious style (Whiting & Edwards 1988). However, meeting infants' needs in a skillful way clearly had positive consequences for all children: infants ceased crying, smiled, and reached out for those who responded appropriately to their signals. Because girls were preferentially assigned tasks of childcare, they had greater opportunities to learn and practice nurturant styles.

This issue brings us finally to the issue of the behavioral consequences of juvenile caretaking. What are the short- or long-term effects? A primary hypothesis in primatology is that juvenile alloparenting functions to ensure later parental competence (Hrdy 1976; Fairbanks, Chapter 15, this volume). Unfortunately, there are few data from free-living primates to demonstrate the effect (Pereira & Altmann 1985). Recent research on captive vervets, however, has shown a

correlation between allomothering and eventual reproductive success (Fairbanks 1990). Also, data from wild tamarins suggest that females may indeed benefit from juvenile experience in handling infants (Baker 1990).

Our data did not allow long-term effects to be examined, but did permit investigation of potential short-term effects. We compared social relations with peers for groups of 6- to 10-year-old children that simultaneously had relatively great versus little interaction with infants. If experience with infants helps children to develop nurturant social styles, then children who interacted most with infants were expected to be more nurturant as well to same-sex peers, their preferred social partners during middle childhood.

The 12 subgroups of boys and girls aged 6–10 from the six communities in the Six Culture Study provided the data (Table 22.6). Peers were defined as children of the same 6–10 age grade as the focal children but not siblings. The predicted correlation was found (two-tailed Spearman rank correlation, $p = 0.61$, $p < 0.05$), supporting the hypothesis of transfer of nurturance from infant to peer contexts for both boys and girls. Although these correlational data do not demonstrate a cause-effect relationship and are not directly analogous to the nonhuman primate studies of allomothering and increased reproductive fitness, they are consistent with the hypothesis that performing infant care may influence children's nurturant behavioral capacities.

Table 22.5. Sex Differences in Mean Proportion of Nurturance to Lap Children by Girls and Boys 4–10 Years of Age

Community	Number of dyads (number of all social acts to lap children in parentheses)		Percentage of nurturance (as a proportion of all social acts to lap children)		
	Girls	Boys	Girls (%)	Boys (%)	Difference
New Samples^a					
Kien-tan	5 (108)	3 (69)	38	25	+13
Kokwet	8 (89)	6 (48)	27	31	-4
Kisa	3 (16)	1 (5)	49	0	+49
Kariobangi	8 (131)	3 (27)	39	29	+10
Ngoca	10 (109)	4 (36)	47	29	+18
Six Culture samples^b					
Nyansongo	6 (174)	3 (35)	45	51	-6
Juxtilahuaca	5 (72)	4 (33)	62	36	+26
Throng	6 (173)	4 (186)	52	41	+11

^aNurturance in the New Samples includes only initiated nurturance. In the Six Culture samples it includes both initiated and responsive nurturance.

^bOnly the communities where the age of the lap child could be identified are included in this table.

Source: Whiting and Edwards (1988, p. 178).

Table 22.6. Interaction of 6- to 10-Year-Old Girls and Boys with Lap Children (0–24 months) and Proportion of Nurturance to Same-Sex Peers

Interaction with lap children		Proportion of nurturance to same-sex peers	
Group	Percentage	Group	Percentage
Nyansongo girls	37	Tarong girls	26
Juxtlahuaca girls	34	Nyansongo girls	20
Tarong boys	28	Juxtlahuaca girls	17
Juxtlahuaca boys	26	Tarong boys	13
Khalapur girls	20	Nyansongo boys	11
Tarong girls	18	Juxtlahuaca boys	10
Taira girls	7	Khalapur boys	10
Khalapur boys	6	Orchard Town girls	9
Nyansongo boys	6	Orchard Town boys	9
Orchard Town girls	5	Khalapur girls	8
Taira boys	4	Taira boys	8
Orchard Town boys	0	Taira girls	5
Mean	16		12

Source: Whiting and Edwards (1988, p. 264).

Weisner (1987) presents supportive data on one of our New Sample groups, the Abaluyia of western Kenya (communities Kisa and Kariobangi). He collected 168 timed observations on 63 children aged 2 to 6. Mothers made more requests and instructions regarding child-caretaking to girls than to boys. Girls, in turn, were more nurturant and prosocially commanding to other girls (age unspecified) than boys were to boys.

Finally, Munroe et al. (1984) compared boys' and girls' workloads in four societies with their modes of social behavior when not working. The children lived in four communities with heavy subsistence workloads: Logoli of Kenya, Garifuna of Belize, Newars of Nepal, and American Samoans. In each community, 48 children aged 3 to 9 were studied by means of spot observations (30 per child) and, on separate occasions, timed observations of social behavior. For both girls and boys, significant positive correlations were found between caretaking levels and nurturance scores when not caretaking, strongly supporting the hypothesis of transfer of nurturance from the infant-caregiving setting to behavior with other partners.

DISCUSSION AND RECOMMENDATIONS FOR FUTURE RESEARCH

In sum, involvement with infants is one of the most consistent sex-differentiated behavioral domains of middle childhood, yet neither the

causes nor the consequences of the phenomenon are well understood. Only recently has the phenomenon attracted the attention of developmental psychologists, due perhaps to their earlier focus on parent-child and peer relationships and to North American ethical values (cultural biases) favoring universalistic over kin-centered norms of care and concern. Child-infant relationships are gaining increased attention and can be seen as central rather than peripheral to the understanding of sex-role and sex-identity development. Indeed, we propose that studying the child-infant dyad in the context of the family provides a natural window into the self-socialization processes that augment and extend behavioral sex differences.

In the prevailing psychological opinion, sex differences in children's involvement with infants are understood primarily as the result of sex-role identification and societal expectations, which jointly lead girls to attend selectively to and imitate adult females and to internalize general expectations for feminine behavior, including (in specific circumstances) nurturance of and preference for infants. In the absence of societal expectations, no differences in nurturance of or preference for infants are predicted, according to this perspective. For example, Fogel (1984, p. 178), a leading expert on infancy and development of nurturance, concludes his review:

It seems that differences in male versus female responsiveness to infants appear in middle childhood

and late adolescence and again in middle age. Young [preschool] boys, men of child-rearing age, and grandfathers seem about equally responsive to babies as their female counterparts. These studies suggest that sex differences in interest in babies may be related to society's expectations of how males and females should behave rather than to some underlying biological [genetic] predisposition favoring females. Males' interest in babies seems to correspond to times in the life cycle when men are exposed to babies and expected to take an interest in them. Women are more likely to be expected to be interested in babies all through their lives.

We would like to modify this account of socialization by placing preferred social partners at the head rather than the tail of the system of causal theorizing. What we call the "company we keep hypothesis" states that age, sex, and cultural differences in children's typical social partners lead to individual differences in social behavior (because of the eliciting properties of various types of dyadic interaction) with long-term implications for social development. On the basis of accumulated cross-cultural observations, we claim that distinctive generic behavior can be identified in particular types of dyadic interaction. These elicited responses appear to be easily learned and to resist extinction, although their specific form is influenced by learning processes that modulate, channel, attenuate, or amplify them in the culturally appropriate direction. Thus in searching to explain the development of sex differences, rather than limiting our analysis to asking whether adults treat boys and girls differently in face-to-face interaction, we begin with the fact that from an early age, girls and boys are typically observed in different settings where they have differential opportunity to interact with various age-sex-kinship categories of companions. They receive differential opportunities to acquire and practice behaviors such as nurturance and aggression—habits that may become lasting and general.

To further differentiate our position from the prevailing account, we consider the possibility of genetically based predispositions. In raising the prior question of why boys and girls frequent different settings and dyadic interactions, we (Whiting & Edwards 1988) have stressed socialization factors such as task assignment. However, on the basis of the primate literature, we also recognize the possibility of complementary predispositions, especially intrinsic prefer-

ence for same-sex partners. The "company we keep hypothesis" fits well with Pereira's (1988a, p. 201) claim: "Animals are predisposed to learn particular types of behavior, and behavioral ontogeny functions, in part, to facilitate this selective learning and ensure that certain early social experiences are virtually inevitable" (see also Pulliam & Dunford 1980).

In sum, we propose that involvement with infants is an important source of sex-typed behavioral development in children. The system of self-socialization is founded on attractiveness to like-sex community members, followed by identification. Girls are predisposed in their development to maintain proximity to adult females, where they receive maximal opportunity to attend selectively and maintain proximity to infants, with the result that they gain knowledge and practice in nurturing styles of interaction. As they gain knowledge and practice, they become more skillful caregivers, with the result that nurturant interaction becomes differentially rewarding to them. The intrinsic rewards of skillful caregiving, along with cognitive-developmental processes motivating girls to increase self-esteem by mastering sex-appropriate competencies, augment and extend the underlying sex differences in social preference and selective attention.

This argument clearly parallels Maccoby's (1988, 1990) and Jacklin's (1989) conclusion that preference for same-sex-peer interaction is a primary facilitator of sex-differentiated development in children. They provide much empirical evidence for the emergence of a preference for same-sex peers in children by age 3, several years before consolidation of sex-role identification. The same-sex preference involves selective attention, selective responsiveness to the reinforcements of same-sex others, and (by middle childhood) tendencies to avoid or exclude the opposite sex when in groups. Maccoby concludes that sex segregation in children's playgroups is a central mechanism in the development of sex-typed behavior and communication styles because of the distinctive "cultures" of boys' versus girls' groups. Our theory complements theirs by highlighting the importance of proximity to mothers and infants in girls' sex-typed development.

To test the proposed theory about the influence of interaction with infants on sex-role development, the following empirical questions

need answers. First, at what age does girls' greater involvement with infants emerge? Does the evidence support the hypothesis that sex-differentiated social preferences and selective attention emerge in early childhood, before sex-role identification is consolidated? Second, if sex-differentiated involvement with infants does emerge early, what process (or combination of processes) causes it? We have suggested that girls are more involved than boys with infants, not as a result of greater basic attraction to infants, but as a secondary result of their attraction to female adults and/or nurturant and caretaking modes of interaction. Careful observation of children's behavior is required under a series of conditions, with improved measurement of how and when children initiate interaction or proximity-seeking and which social partners they selectively observe and imitate. Methods used in studying spacing behavior, proximity, and allomothering in nonhuman primates (e.g., Hinde & Atkinson 1970; Pereira 1988a; Fairbanks 1990) would enable observation of children in

natural family situations while maintaining sufficiently refined data to separate the three factors.

Finally, what are the short- and long-term sequelae of children's involvement with infants? Data are needed to test potential hypotheses about caregiving experiences as source of (1) nurturant style of relating to peers, (2) later parenting skill, (3) generalized preference for needy social partners, and (4) the centrality of caring for others to emerging sex-role self-concepts, and other potential consequences.

Studies addressing these questions should clarify the role of interaction with infants in sex-differentiated behavioral development and provide the data we need to understand the fundamental processes of self-socialization.

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