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## Fathers and Infants among Aka Pygmies

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Aka fathers provide more direct care and are near their infants more than fathers in any other human population that has been investigated. Aka fathers are within an arms reach (i.e., holding or within 1 m) of their infant more than 50% of a 24-hour period (Table 9.1) and Aka fathers hold their very young infants during the day at least five times more than fathers in other human populations (Table 9.2). While Aka father care is extensive, it is also highly context dependent—fathers provide at least four times as much care while they are in the camp setting than they do while out of camp engaged in economic activity (e.g., out on the net hunt or in the villagers' fields) (Figure 9.1).

Previous publications (Hewlett, 1988, 1991) have emphasized how female travel on the net hunt contributes to the high level of Aka paternal involvement. Unlike most other forms of hunting, the net hunt involves both women and children. This means Aka women and men walk the same 5–15 km during the day. In most preindustrial populations, women gather or farm near the camp or village, while men travel far away to hunt or trade. In societies where women gather or farm near the camp or village older siblings of the infants are often the second most important caregivers of the infants (Weisner and Gallimore 1997). Among the Aka, however, older siblings do

not provide infant care even though they are on the net hunt because older siblings cannot carry infants long distances on the hunt. Older siblings can sit and hold an infant while a mother collects or farms, but they cannot carry an infant long distances. The energetic demands of walking may also explain why the few grandmothers that are around do not help with infant care as much as is found in other populations. Aka fertility is also high (total fertility rate is 6.3) and infants are nursed for 2–4 years. This means most Aka women 18–45 years of age have a nursing infant-child, and there are only a few adult women without children who might help women with young children. The weight of infant/weight of adult female ratio is also high by cross-cultural standards (Table 9.3), which means that carrying an infant (and basket full of meat and other collected foods) is especially demanding for Aka women. Efe pygmy women also have a high weight of infant/weight of adult female ratio, and may be a contributing factor to their extensive multiple caregiving (Winn et al. 1990). The energetic demands on Aka mothers during the net hunt help to explain, in part, why Aka fathers are likely to help out with infant care while the family is out on the net hunt—Aka women need the assistance of another adult to help carry the infant during the hunt, and Aka men are essentially the only

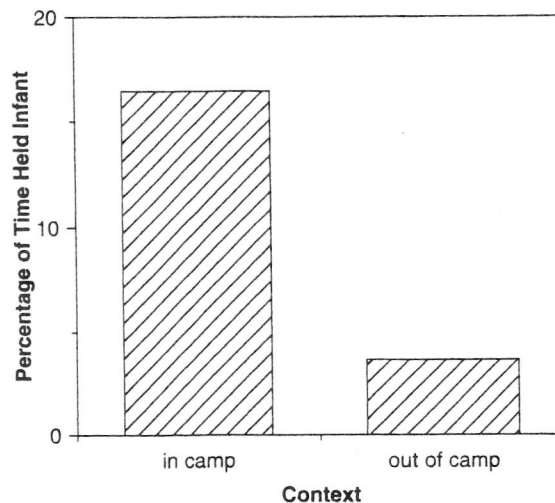
Barry S. Hewlett, "Husband-Wife Reciprocity and Father-Infant Relationship among Aka Pygmies," from B. Hewlett, Ed. *Father-Child Relations: Cultural and Biosocial Contexts*. New York: Aldine de Gruyter, 1992.

Table 9.1 *Average percentage of time an Aka father is within an arm's reach of his infant*

	6:00 AM–6:00 PM		6:30 PM–9:00 PM		9:00 PM–6:00 AM (est.)		Total	
	Minutes	% of time	Minutes	% of time	Minutes	% of time	Minutes	% of time
Average time holding	57	7.9	35	23.3	0.0	0	92	6.5
Average time in proximity	54	7.5	42	28.3	540.0	100.0	636	45.1
Total	111	15.4	77	51.6	540.0	100.0	728	51.6

Table 9.2 *Father infant holding in foraging populations (camp setting only)*

Population	Age of infants (months)	Father holding (% of time)	Source
Aka Pygmies	1–4	22.0	Hewlett (1991)
Efe Pygmies	1–4	2.6	Winn et al. (1990)
Gidgingali	0–6	3.4	Hamilton (1981)
!Kung San	0–6	1.9	West and Konner (1976)

Figure 9.1 *The context of Aka fathers' infant holding*

adults available to help out. While Aka fathers do provide exceptionally high levels of infant care while out on the net hunt or engaged in other economic activity outside of the camp—Aka fathers do just as much infant holding outside of camp while engaged in economic

activity as fathers in other foraging populations provide while sitting around in camp (about 3–4% of the holding; see Table 9.2 and Figure 9.1) when they are *not* engaged in economic activity—Aka fathers are much more likely to provide caregiving while they are in

Table 9.3a *Ratio of mean birthweight to mean weight of adult (18–45) women in various populations*

<i>Population</i>	<i>Mean birthweight of infants (kg)</i>	<i>Mean weight of women (kg)</i>	<i>Ratio (%)</i>	<i>Reference</i>
Turkish (Istanbul)	3.4	57.1	5.9	Neyzi et al. (1987)
Filipino	3.0	50.5	5.9	Adair and Popkin (1988)
American (Philadelphia)	3.4	60.9	5.8	Cronk et al. (1986)
Peru Lowland (Lima)	3.2	62.7	5.1	Frisancho et al. (1977)
Peru Highland (Cuzco)	3.1	54.6	5.7	McClung (1969)
Egyptian	3.3	56.1	5.9	Afifi (1985)
Bantu and Sudanese (NE Zaire)	2.9	54.2	5.4	Vincent et al. (1962)
Aka Pygmies	2.8	42.2	6.6	Hewlett (unpublished)
Efe Pygmies	2.6	38.0	6.8	Bailey (1991 and personal communication)

Table 9.3b *Ratio of mean adult women's (18–45) weight to mean 1 year old's weight in various populations*

<i>Population</i>	<i>1 year old weight (kg)</i>	<i>Adult (18–45) women's weight (kg)</i>	<i>Ratio (%)</i>	<i>Reference</i>
Nonafrican				
Czechoslovakia	10.2	67.3	15.1	Kapalin et al. (1969); Prokopec (1972)
Bundi (New Guinea Highlands)	7.7	49.9	15.4	Malcolm (1970, 1969)
Kaiapit (New Guinea Lowlands)	7.6	53.0	14.3	Malcolm (1969)
African				
Egyptian (rural village)	7.8	56.1	13.9	Afifi (1985)
Nigeria (Ibadan—well-off)	9.6	64.6	14.8	Janes (unpublished; in Eveleth and Tanner 1976)
Nigeria (Ibadan—slum)	8.1	52.9	15.3	Janes (unpublished; in Eveleth and Tanner 1976)
Turkana (rural Kenya)	7.9	48.1	16.4	Little et al. (1983)
Somali (urban Somalia)	8.0	50.3	15.9	Gallo and Mestriner (1980)
Gambia (rural village)	7.3	52.2	14.0	McGregor et al. (1961); McGregor and Smith (1952)
Aka Pygmies	7.5	42.2	17.5	Hewlett (unpublished)
Efe Pygmies	7.3	38.8	18.8	Bailey (personal communication)

**Table 9.4** *Mother's activity while father is holding infant*

<i>Mother's activity</i>	<i>% of time</i>
Left camp to collect firewood or water	24
Food preparation	32
Net hunting	18
House maintenance	7
Idle	12
Other (includes talking to others and eating)	8

camp while the mother is engaged in food preparation or collecting firewood or water (Table 9.4). Women in most societies prepare the food and collect the firewood, but seldom do they receive any assistance with infant care from men while they are doing these activities. There are numerous societies (including our own) where women could use some help with infant care while they prepare food or clean the house, but in most societies men do not help out with infant care even though they are not engaged in any productive activity and are close by to help out. Older siblings or other adult women are often called on to help out. Older siblings are available in the Aka camp, but it is the father who provides most of the assistance with infant care.

The energetic constraints mentioned above do not help explain why Aka fathers provide exceptionally high levels of infant care in camp. Hewlett (1991) has suggested that husband-wife relations are central to understanding Aka fathers' infant caregiving, but has not provided data to support the contention. This chapter quantitatively and qualitatively describes the diversity, nature, and frequency of Aka husband-wife interactions and how this relationship influences father-infant caregiving.

### **Husband-Wife Relations and Infant Care**

Psychologists have indicated for some time that marital relations and parent-child relations are interdependent, but the psychologists'

studies have focused almost exclusively on how marital relations influence mothering. Happily married mothers feel more pleased and competent in their maternal role (Goldberg and Easterbrooks 1984; Cox et al. 1985; Heinicke 1985; Meyer 1988). More recently psychologists have examined how marital relations influence fathering and have found that marital closeness is related to level of father's involvement (Belsky et al. 1989) and father's positive attitudes and warm feelings about his infant (Easterbrooks and Emde 1988). While the psychologists have identified a relationship between marital and parent-child relations, they seldom try to explain why husband-wife relations are linked to parent-child relations. Most studies simply imply an emotional-affective "spillover" effect (Engfer 1988), that is, if husband-wife relations are warm and close then this sensitivity will spillover into parent-child relations.

This chapter builds on the psychological studies by identifying factors in the marital relationships that are linked to father involvement among Aka Pygmies. The chapter hypothesizes that as the number, frequency, and cooperative nature of activities that husband and wife participate in together increases, the level of father involvement increases. Aka husband and wife frequently engage in a number of different types of activities that often require husband and wife to actively cooperate. Husband and wife share extensively as a result of the frequency and nature of their interaction. Infant caregiving is one part of husband-wife reciprocity. Fathers are active infant caregivers when they are not engaged in economic activity and the mother could use some assistance (e.g., she is preparing food, collecting firewood or water).

This hypothesis is a synthesis of reciprocal altruism theory, social organization of work theory, and the concept of many stranded relations from economic anthropology. Reciprocal altruism theory is important because it helps to explain why frequency of interaction is an important component of reciprocity. Evolutionary biologists indicate that two genetically unrelated individuals are likely to practice reciprocal altruism (i.e., share and help each other out) when there is a high likelihood



that the individuals will see each other again and there is a high likelihood of receiving something in return for sharing (generally greater than that which is given) (Axelrod and Hamilton 1981; Irons 1979). Reciprocal altruism is sometimes referred to as tit-for-tat theory or "you scratch my back and I'll scratch yours." According to this neo-Darwinian theory, one is likely to share with neighbors or fellow workers because there is a high likelihood that one will see them again and there is a chance of getting something slightly greater in return for sharing or helping out. Reciprocal altruism also implies that an increase in the frequency of interaction generates greater familiarity between two individuals (Cosmides and Tooby 1989); that is, the individuals are better able to read and understand each other needs, desires, and expectations and are therefore able to share and support each other in a number of different ways (e.g., economically, socially, emotionally). But the key variables with this theoretical orientation are not emotional attachment or physical attraction, but the frequency of face-to-face interaction and the likelihood of receiving something in return.

Research by Arensberg (1937) and Johnson and Johnson (1975) on the social organization of work has demonstrated that the nature of husband-wife interactions during the work process contributes to the equality/inequality in male-female relations. "Where men and women cooperate in the productive sphere, the sexes are reciprocal, and there is clear recognition of the importance of women" (Johnson and Johnson 1975:635). Johnson and Johnson describe the great amount of time Machiguenga men and women spend in cooperative work effort in the fields, and link this to the generally high equality between men and women in the society. The social organization of work studies are important because they demonstrate the importance of the *nature* of husband-wife interaction, not just the frequency of that interaction.

Wolf (1966: 81) used the terms "many-stranded" and "single stranded" to describe peasant social and economic relations.

The image underlying this terminology is that of a cord, consisting either of many strands of

fiber twisted together or of one single strand. A manystranded relation is built up through the interweaving of many ties [economic, social and symbolic], all of which imply one another. . . . The various relations support one another. A coalition built up in terms of such a variety of relations gives men security in many different contexts.

Wolf describes how unilineal descent groups and the compadre system in Latin America have manystranded social and economic relations. Wolf's concept of manystranded is useful in this discussion of husband-wife reciprocity because it suggests that the *variety* of interactions and their linkages are important factors in understanding reciprocity. Husband-wife reciprocity may be influenced by the *diversity* of activities they do together as well as the frequency and nature of those activities.

A synthesis of these theories and terms suggests that husband-wife reciprocity may be influenced by the frequency of face-to-face interaction, the number of different things they do together, and the nature of that time together. Husband and wife are predicted to share and help each other out more when they spend a lot of time together, cooperate in their activities, and do many kinds of activities together.

How is husband-wife reciprocity linked to the level of father's infant caregiving? Infant caregiving is only one of many tasks that is potentially shared by husband and wife. When husband and wife help each other out frequently in a number of different contexts, fathers are predicted to help out more with infant care. Fathers are providing the care in exchange for assistance the mother has or will provide in other contexts. Father's caregiving is a form of "generalized" reciprocity (Sahlins 1972) in that the timing and level of reciprocal help from his wife are nonspecific. But due to the frequency, nature, and diversity of husband-wife relations he knows that reciprocity will eventually take place.

### The Aka

The Aka are hunter-gatherer-traders of the tropical forest regions of the southern Central African Republic (CAR) and northern People's

Republic of the Congo (PRC). There are about 30,000 Aka (8,000 in CAR and 22,000 in PRC) in the region. The Aka families in this study are associated with the Bokoka section of Bangandou village; there are approximately 300 Aka associated with Bokoka and 769 farmers, primarily Ngandu peoples, who live in this section of the village. The Aka spend about 80% of their time hunting and gathering, but are transitional hunter-gatherers in the sense that some 50% of their diet comes from domesticated village products (Bahuchet 1989). They acquire these village products primarily through extensive trade relations with traditional village partners—hunted meat and other forest products are traded for manioc and other village products. The term many stranded relations, discussed above, applies to Aka-villager exchange because their relations are multidimensional—i.e., there are social and symbolic dimensions as well as economic ones. For instance, villagers and Aka contribute to and participate in each other's funerals and clan dances. Aka today also acquire some of their domesticate foods from their own small fields deep in the forest. The average camp has 25–35 individuals and the Aka move camp three or four times during the year. Fertility and mortality are both high—women average 6.3 live births during their lifetime and one-fifth of the infants die before reaching 12 months, primarily of infectious and parasitic diseases.

The net hunt is the most common subsistence activity during the year. Each nuclear family usually has a net made of forest fibers 20–50 m in length and 1 m high, and there are usually 6–8 nets in a camp of 25–35 individuals. The husband usually carries the net and lays it out while his wife sets up and secures the net so animals cannot crawl underneath or jump over the net. The 6–8 nets are connected to each other so as to make a circle or semicircle. Once the family net is set up the husband goes to the center of the nets while his wife stands behind a tree on the inside of the circle of nets next to the family net. When all the nets are set up, a signal is given and the men in the center of the nets start to walk toward their family nets as they

yell and scream and pound the ground with logs to try and startle the nocturnal duikers, the primary game animals of the net hunt. If a duiker is spotted it is chased toward the net and the husband yells to the wife the movements of the animal. She waits behind the tree until the duiker passes her, at which time she screams and scares the animal into the net. She tackles the duiker and grabs a nearby log to kill it. She has usually killed the duiker by the time the husband arrives at the net. For some larger species of duiker (i.e., over 40 kg) the husband or other nearby males and females usually arrive in time to help kill the animal. While this is the primary way of organizing the net hunt there are several other formats (e.g., role of men and women reversed) (Bahuchet 1985). Infants usually stay with their mother and older children go wherever they wish. After each cast of the nets there is a 15- to 45-minute rest period and there are 5–15 casts of the net during the day. Game that is captured in the family net is shared with other camp members in two ways. The husband or wife gives specific sections of the animal to others who directly contributed to the capture of the animal (e.g., helped jump on animal in net or helped the family set up the net), or after the wife prepares a pot of stew with the duiker, she sends out small bowls of the stewed meat to most, if not all, the other households in the camp.

While to net hunt takes place throughout the year, it is least likely to take place during the season of heavy rains (September–October) when cross-bow, small traps, and spear hunting predominate, the caterpillar and honey seasons (August and May), or while camp members are in the village to work for villagers.

The Aka are patrilineal and generally practice virilocality except for a few years after marriage when the male provides bride service in his wife's family camp. Kinship terms are basically generational. The Aka are fiercely egalitarian in that there are a number of mechanisms to maintain social and economic equality (Hewlett 1991). Sharing, cooperation, nonviolence, and autonomy are but a few of the Aka core values.

### Aka Husband-Wife Relations and Father Involvement

Aka husband and wife participate together in a wide range of activities. Table 9.5 lists the diversity of activities that husband and wife participate in together and the general nature and frequency of that time together. Husband and wife may work or participate within the larger group or they may go out alone together. Husband and wife participate in the camp net hunt as well as go out alone together to collect fruits or caterpillars and to hunt small animals with string snares. Husband and wife are together for a wide range of both social and

economic activities. They hunt and gather together as well as dance, sing, and relax together. They also sleep close together in a remarkably narrow bed (about 50–70 cm wide). Husband and wife see and actively work with their spouse in a number of different contexts. The diversity of interactive contexts contributes to the manystranded nature of the husband-wife relationship and provides security to the relationship. Security is developed as husband and wife see and learn how to respond to and count on each other in these diverse contexts.

Table 9.5 also distinguishes cooperative from associative interaction. Cooperative interaction means that frequent communication

**Table 9.5** *Number, relative frequency, and nature of husband-wife interactions in subsistence and social activities*

<i>Activity</i>	<i>Frequency activity takes place<sup>a</sup></i>	<i>Frequency husband and wife do this together<sup>b</sup></i>	<i>Nature of interaction</i>
Subsistence activities			
Net hunt	2	1	Cooperation
Collect fruits, termites, leaves, caterpillars, ignames	2	1	Cooperation and Association
Fish	5	1	Cooperation
Make palm oil for villagers	3	2	Cooperation
Clear, plant, harvest villager's fields	3	2	Association
Hunt with small traps (small nets, snares)	4	2	Cooperation
Capture animals by hand (pangolins, turtles)	4	2	Cooperation
Bow and arrow or cross-bow hunt	3	3	Association
Food preparation	1	3	Association
Butcher and divide game animals	2	3	Association
Social and other activities			
Eat	1	1	Association
Sleep	1	1	Association
Move camp	5	1	Association
Travel to visit friends or relatives	4	2	Association
Childcare	1	3	Association
Drink palm wine	3	3	Association
Dance and sing	1	3	Association
Leisure	1	3	Association

<sup>a</sup> 1, almost every day; 2, 4–6 days per week for 8–9 months per year; 3, 2–5 days per week for 3–4 months per year; 4, 10–20 times during the year; 5, 3–10 times during the year.

<sup>b</sup> 1, almost always when this activity occurs; 2, about 50% of the time this activity occurs; 3, about 25% of the time this activity occurs.

and interdependence between husband and wife contribute substantially to the efficiency and effectiveness of the task or activity. For instance, husband and wife have to be able to communicate easily and quickly on the net hunt to get the game into the net. Association means that husband and wife are together, but their tasks or activities are parallel and not dependent on one another. For instance, husband and wife eat, sleep, and work in villagers' fields together, but these activities will take place easily regardless of the presence of the other spouse. While I do not have quantitative data on the frequency of cooperative versus associative work effort, it is clear that Aka husband and wife spend a considerable amount of time in cooperative work effort since the net hunt is the most common subsistence activity throughout the year.

Limited quantitative data do exist on the frequency of Aka husband-wife interaction. Father-focal behavioral observations were conducted as part of the father-infant study mentioned earlier (Hewlett 1991). Each of the 15 fathers were followed for 12 daylight hours (6 AM-PM), and every 15 minutes the following were recorded: (1) all individuals within 1 m of the father (but not being held by the father), (2) the father's nearest neighbor—the closest individual within 10 m of the father (but not being held by the father), and (3) the

availability of his infant and wife (within view, within hearing distance, or out of area).

The frequency of Aka husband-wife interaction is exceptional in a number of ways. First, husband and wife were within view of each other 46.5% of the time during daylight hours. If one considers that once the sun goes down everyone is in camp and husband and wife are certainly within view, and that husband and wife sleep together, husband and wife are within view of each other 72% of a 24-hour period. Second, the husband's nearest neighbor was his wife 17.8% of the daylight hours, and his wife was the first or second most frequent nearest neighbor for 13 of the 15 focal fathers. Finally, the husband's spouse was within 1 m of him 10% of daylight hours, and his wife was the first or second most proximal individual in 9 of the 15 focal fathers. Again, these percentages would increase dramatically during evening hours.

While Aka men are near their wives frequently, it is misleading to suggest that Aka men spend most of their time with their wives. As Figure 9.2 demonstrates, Aka men spend most of their time in the company of other adult men or young boys. Also, Aka husband and wife are very close, but they do not hold hands, kiss or hug, or show other signs of affection in public. Husband and wife will tease, joke, and engage in physical play with each other.

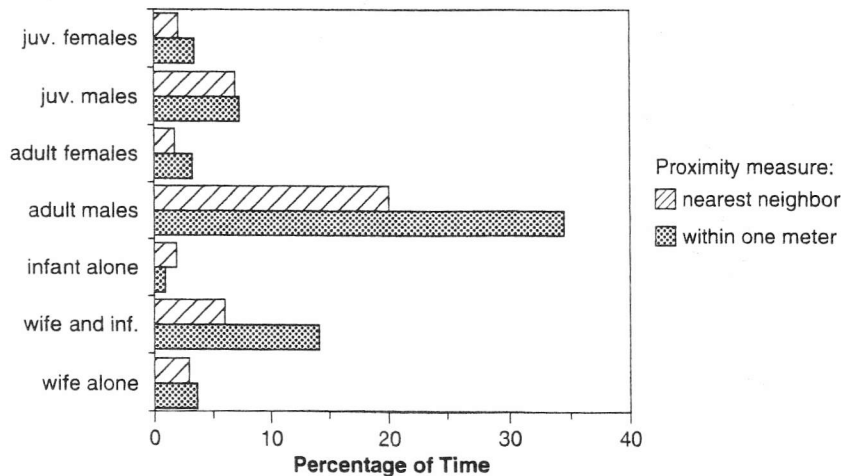


Figure 9.2 Individuals that were nearest neighbor or within 1 m of Aka fathers

Table 9.6 Correlations between father's holding of infant and proximity measures of mother and infant proximity measures

	Infant			Mother		
	Availability	Nearest neighbor	Proximity	Availability	Nearest neighbor	Proximity
Correlation to father's holding						
<i>r</i>	0.002	0.205	0.285	0.085	0.488	0.611
<i>p</i>	0.990	0.531	0.303	0.760	0.062	0.015

The Aka husband-wife relationship is close, diverse, and cooperative, but how is it directly related to the level of paternal involvement? Table 9.6 examines the statistical relationships between the amount of time fathers held their infants and how frequently they were close to their infants and wives. The table demonstrates that father's holding is not related to how often he is available, nearest neighbor, or within 1 m of his infant, but father's holding almost reaches significance for the amount of time that mother is nearest neighbor, and does reach significance for the amount of time that mother is within 1 m. These results were somewhat unexpected as the average amount of time the focal infant and wife are nearest neighbor and within 1 m of the father is very similar. Table 9.7 lists the father's proximity scores for the wife and infant, and indicates that there is tremendous variability between individuals and that the wife and infant values for each individual can be very different even though the means are very similar. Overall, these limited data are consistent with the hypothesis that as husband-wife time together increases father involvement in infant/child-care is also likely to increase.

A relationship between frequency of husband-wife proximity and level of father involvement is especially pronounced when the wives' proximity to the four fathers who showed high levels of infant involvement (i.e., held their infants more than 2 hours during daylight hours on average) is compared to the wives' proximity of the 11 other fathers (i.e., held their infant less than 40 minutes during daylight hours on average). Involved fathers are within 1 m of their spouses almost

Table 9.7 Percentage of time the focal father's wife or infant are within 1 m

Father number	Mean % of time in proximity	
	Wife	Infant
1	06.1	02.4
2	02.5	02.1
3	18.4	16.7
4	08.2	01.1
5	00.0	01.0
6	02.1	11.4
7	22.4	08.1
8	26.5	16.3
9	00.0	00.0
10	08.3	04.1
11	08.4	09.8
12	10.2	13.6
13	08.2	03.4
14	00.0	03.8
15	28.6	19.6
Mean	10.0	07.6

three times more frequently than the other fathers (Figure 9.3). The differences are statistically significant [holding-proximity:  $\chi^2(1) = 23.9, p < 0.01$ ; holding-nearest neighbor:  $\chi^2(1) = 10.9, p < 0.01$ ].

### Cross-cultural Patterns of Husband-Wife Relations and Father Involvement

Whiting and Whiting (1975) and Broude (1983) have utilized the standard cross-cultural sample (SCCS) (Murdock and White 1969) to examine husband-wife relations. Both studies



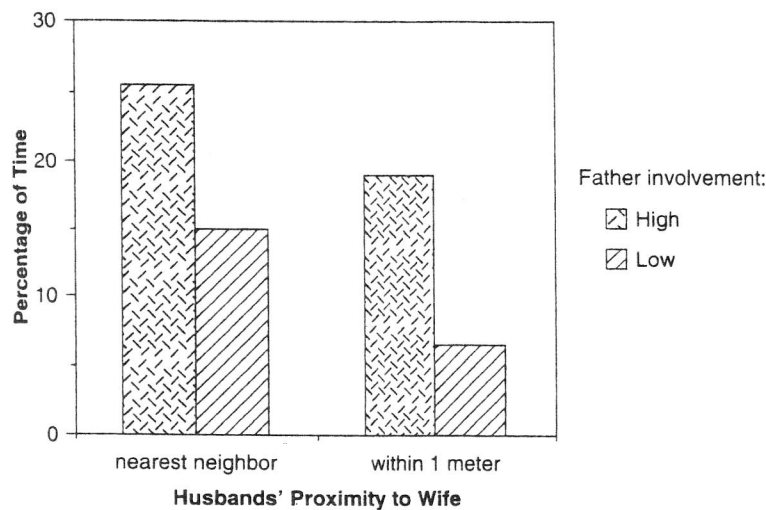


Figure 9.3 Level of father's involvement with infant and mother's proximity

indicate that there is a constellation of sociocultural factors that is linked to "aloof" versus "intimate" husband-wife relations. The Whittings were primarily interested in explaining why husband and wife room apart in some societies, and found that husband and wife room apart when the society needs warriors to protect property. According to the Whittings, the rooming apart and other aspects of "aloof" husband-wife relations have the psychological effect of producing hyperaggressive males. But their study is of interest for this chapter because they identify other factors that are linked to aloof versus intimate rooming arrangements of husband and wife. They found husband-wife rooming arrangements linked to husband-wife eating arrangements, absence or presence of men's houses, the level of father involvement in childcare, and the presence or absence of the father at childbirth. Husband and wife sleeping together was statistically correlated to husband and wife eating together, the absence of men's houses, and, most importantly for this chapter, having father involved in childbirth and the care of young children.

Broude was interested in the relationship between sexual and non-sexual aspects of the husband-wife relationship. She developed and utilized a number of new cross-cultural codes on the sexual (e.g., premarital sex, extramarital

sex, divorce frequency, impotence, newlywed customs) and nonsexual (e.g., eating and rooming arrangements, leisure activities) aspects of husband-wife relations. Her study found that there were few correlations between the sexual and nonsexual aspects of husband-wife relations. The study did identify three "clusters" of variables, one of which is of interest to this chapter. Similar to the Whittings' findings, her cluster 3 shows strong correlations between men's houses, husband-wife eating, husband-wife rooming, husband-wife leisure activities, and husband attendance at birth. Unfortunately, she did not include a measure of father involvement in childcare in her study. Table 9.8 averages Broude's codes for husband-wife eating, sleeping, and leisure activities for the 37 societies in the SCCS with all three of her codes as well as Barry and Paxson's (1971) code for level of father involvement in infancy in these societies. Again, there is a statistical relationship between father involvement and husband-wife proximity.

## Discussion

This chapter has tried to understand (1) why Aka fathers provide substantially more direct infant care in the camp setting rather than out



Table 9.8 Relationship between husband-wife proximity and father involvement in 37 societies

	Father involvement score <sup>a</sup> for number of societies	
	2-3	4-5
Mean score of husband-wife proximity <sup>b</sup>		
1.0-1.5	4	10
1.6-3.0	17	6

<sup>a</sup>This score comes from Barry and Paxson (1971): 2-3, fathers have little or some physical and emotional proximity to infants; 4-5, fathers have regular or frequent physical and emotional proximity to infants.

<sup>b</sup>This score is the average of the following three scores from Broude (1983): husband-wife eating arrangements, husband-wife rooming arrangements, and husband-wife leisure time activities. *Note:* A score of 1 on any of these measures means that husband and wife eat, sleep, or have leisure activities together, while a score of 3 means they are not together for these activities.

on the net hunt when there are good ecological-energetic reasons for increased paternal caregiving; and (2) why Aka fathers provide more direct infant care than fathers in any other known society. The chapter suggests that to understand the level of father involvement among the Aka or any other society it is necessary to examine the frequency, nature, and diversity of husband-wife interaction. As the frequency and cooperative nature of different husband-wife interactions increase the level of father involvement is predicted to increase. Qualitative data described the cooperative nature of Aka husband-wife interaction and the number of different activities that husband and wife participated in together. Intracultural and intercultural quantitative data demonstrated a correlation between the level of father involvement and husband-wife proximity. Father involvement increases as the amount of time husband and wife spend together increases.

But what are the mechanisms by which husband-wife interaction increases paternal care? Psychologists generally indicate that when the husband-wife relationship is warm and close (implying that physical and emotional proximity are closely linked) that the emotional togetherness spills over into the father-infant relationship. Marital satisfaction leads to greater paternal care. Emotional satisfaction is central to white middle-class Euroamerican marriages because the Euroamerican family is so mobile, nucleated, isolated, and far

away from relatives so that emotionally close relationships are hard to come by. The psychologist's explanation makes sense in the Euroamerican context, but it is not as useful for explaining Aka husband-wife relations. Aka are of course very mobile, but they move with or to family, and share emotions and experiences with many people they have known since childhood. Husband-wife emotional satisfaction is not as critical for Aka as it is for Euroamericans. While not a primary factor among the Aka, very low marital satisfaction could lead to a decrease in the level of paternal care because the father would spend more time away from camp and his infant to look for a new wife. But the marital satisfaction hypothesis also means that Aka marriage satisfaction should be substantially greater than what is found in other societies since most all Aka fathers provide substantially more paternal care than fathers in other societies, such as Efe and !Kung, where paternal care is much lower. There is no evidence to suggest that the Aka experience greater marital satisfaction than couples in other societies—arguments, divorce, and extramarital relations are common.

Surprisingly, I have been unable to locate psychological studies that suggest that increased husband-wife interaction leads to father-infant attachment. If a father is around his infant more frequently because he has a close relationship with his wife, it is possible that he may become "attached" to the infant. It is clear that infants become attached to both

mothers and fathers (Ainsworth 1977; Lamb 1981) either by providing regular nurturing care or vigorous play, but little research has focused on mother or father attachment to the infant. The father may become involved because he is near the infant more often, becomes familiar with the infant's communication system, and possibly derives some emotional satisfaction out of the relationship. This hypothesis suggests father caregiving increases when the husband-wife relationship is close because the father becomes attached to the infant and wants and enjoys being near his infant. This explanation helps to explain part of the increased involvement of Aka fathers. Aka fathers intrinsically enjoy their infant caregiving role and seek interaction with their infants. For instance, Table 4 was used earlier in the chapter to indicate that fathers usually take care of infants when the mother is busy with other tasks, but the table also demonstrates that 20% of the time the father holds the infant the mother is *not* engaged in economic activity (i.e., she is idle, talking with others, or eating). Aka fathers also pick up and hold infants simply because they want to hold the infant (Hewlett 1991).

Marital satisfaction and father attachment to his infant may help to explain some of the increase in father caregiving associated with increased husband-wife interaction, but husband-wife reciprocity is most likely the prime factor that leads to increased paternal involvement among the Aka. The Aka are unique cross-culturally because both men and women participate in net hunting most of the year. This regular subsistence activity means that husband and wife see each other most of the day and that they have to cooperate extensively to be successful. These are the two criteria necessary for high levels of reciprocal altruism—frequent interaction and the likelihood of receiving something in return. The frequent cooperative nature of husband-wife interaction is important because it means that there is regular give and take between husband and wife. One consequence of the frequent and cooperative interaction is that Aka husband and wife know how to read each other extremely well. They can communicate quickly, easily, and nonverbally. Their familiarity with

each other contributes to their ability to help each other out. There are numerous tasks that take place out on the net hunt—setting up the net, chasing game, singing, childcare, collecting fruits, etc.—and most identify men or women as primarily responsible for the task (e.g., men carry the net and women carry the basket and infant). But husband and wife help each other out with these various tasks because they are together often, give and take throughout the day, know when each is tired and needs assistance, and know that there is a high likelihood that their help will be reciprocated. The generalized reciprocity continues to take place when the family returns to camp. Fathers help out extensively in infant care in the camp because it is not energetically demanding or costly (especially by comparison to mother's carrying the infant on the hunt) because they usually sit and hold the infant, they can continue their conversations with other adult males in camp (a common activity of males when they return to camp), it helps out their wives while they are preparing food or collecting water or firewood, and there is a high likelihood that their help will be reciprocated soon—often the next day out on the net hunt.

From an evolutionary or Darwinian perspective, male parental care is considered part of parenting effort (see introduction for an overview). Smuts and Gubernick (this volume) question this view, and make a convincing argument that in some contexts male caregiving may be mating effort. This chapter, on the other hand, suggests something contrary to both propositions—in given contexts male care may be part of somatic effort (i.e., subsistence effort). Aka men may hold and take care of their infants as part of generalized and extensive reciprocal relations with their wives. Specifically, Aka men may take care of infants in exchange for assistance in subsistence activities (primarily the net hunt).

If father's infant caregiving is part of parental effort, father's direct care should enhance infant survival. While it is clear that Aka infants with no father are at much greater risk of death by comparison to infants with fathers (Aka infants born without an identified father die within 6 months), it is not clear how

caregiving directly increases survival. For instance, 4 of the 15 study infants died before their fifth birthday. Two of the infants had very involved fathers and 2 of the infants had relatively inactive fathers. While certainly not enough data to draw any conclusion, it made me question the idea that direct care was an essential part of parental effort. Subjective observations suggest that infant mortality is not linked to the level of paternal involvement. Most infants and young children with fathers seem to survive or die at the same rate regardless of the level of their father's direct caregiving. There are also other African Pygmy populations in similar environments where fathers provide minimal amounts of direct care (Winn et al. 1990) and the infant mortality levels are substantially lower. Other aspects of father's role may be more critical for infant and child survival—e.g., providing and cultural transmission.

Smuts' and Gubernick's hypothesis that in some contexts male-infant care may be mating effort rather than parenting effort helps to explain some features of Aka paternal care. Aka men without many kinship resources provide the greatest levels of direct care to their infants (Hewlett 1988). This suggests that an Aka man with few resources is willing to help out more with infant care in order to maintain the marriage. Aka men with many kinship resources are able to keep their wives by providing them with help and security from many relatives (the number of relatives the husband has is important because the Aka are virilocal). Aka men with fewer resources do not have this option and infant care therefore becomes part of mating effort rather than parenting effort. Male-infant caregiving is also a regular part of Aka life and all Aka women are likely to select men who publicly demonstrate sensitive caregiving. Men therefore have something to gain (extramarital affairs, new wife) by exhibiting sensitive caregiving in public. But this chapter suggests that husband-wife reciprocity is central to understanding the father-infant relationship, and reciprocity is generally considered part of somatic effort (Alexander 1979). An Aka man may be willing to engage in some reciprocity to enhance his mating effort (i.e., keep his mate happy), but I would

suggest that most Aka men engage in extensive reciprocity with their wives because they expect to get substantial help from their wives in a wide range of subsistence activities (i.e., somatic effort).

Distinct features about Aka culture and environment help to explain why Aka male-infant care is part of somatic effort. First, as mentioned several times already, husband and wife cooperate frequently in a diversity of subsistence as well as social activities. There are many societies like the Aka in which women contribute substantially to the family diet, but in most of these societies men and women work apart and men do very little childcare (e.g., Hames, this volume). The nature of husband-wife interactions, therefore, is the important factor to understanding reciprocity, not the percentage of calories that males versus females contribute to the diet. Second, the Aka are mobile hunter-gatherer-traders and have minimal (by cross-cultural standards) amounts of warfare and violence. They do not have land or cattle to defend, population densities are low, and game animals are relatively abundant. This means that Aka fathers-husbands do not need to be active protectors and defenders of the family, and can therefore devote more time to providing and caregiving. If Aka fathers had to actively defend resources, it is unlikely that they would be involved with childcare, regardless of the amount of cooperative time that husband and wife spent together. Finally, the demographic and biological features mentioned earlier also contribute to the increased husband-wife reciprocity—high fertility and a relatively high weight of infant/weight of adult female ratio.

## Conclusions

1. Aka fathers provide more direct infant care than fathers in any other known society and provide substantially more direct infant care in the camp setting rather than out on the net hunt when there are good ecological-energetic reasons for increased paternal caregiving due to the unique

nature of Aka husband-wife interaction. Aka husband and wife are frequently together, engage in a diversity of tasks together, and often cooperate in these tasks. There is no other known society in which husband and wife relations are as intimate. The nature of husband-wife interaction contributes to extensive generalized husband-wife reciprocity. Infant caregiving is only one of many tasks that are shared by Aka husband and wife. When husband and wife help each other out frequently in a number of different contexts, fathers help out more with infant care. Fathers provide infant care in the camp setting because it is not energetically demanding and their help is likely to be reciprocated the next day in other contexts.

2. Intracultural and intercultural data demonstrated a relationship between frequency of husband-wife interaction and father involvement in infant care. The more time husband and wife are together the greater the likelihood that the father participates in infant care.
3. Fathers' direct care of infants may be part of somatic effort rather than parental or mating effort.

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