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The Efe Forager Infant and Toddler's Pattern of Social Relationships: Multiple and Simultaneous

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This study extends previous observations on the multiple caretaking system of newborns and young infants among the Efe foragers of Zaire, to Efe infants and toddlers, whose social contacts with mother, father, adults, and children at 5 and 8 months and at 1, 2, and 3 years were observed naturalistically. The Efe infant experiences a pattern of simultaneous and multiple relationships rather than a pattern that is initially focused on one person, most typically the mother, and that with development progresses to other relationships. This pattern is influenced by physical and social ecological factors and cultural practices. It is argued (a) that this pattern of social experience leads to a sense of self that incorporates other people and (b) that some of our assumptions about the nature of social development, especially that early relationships are hierarchical and sequential in nature, require reevaluation.

Who are the people that make up the social world of the infant and toddler? How often are these people involved with them, and in what way? How does the infant's relationship with social partners change as the infant gets older? And what role do sociocultural, ecological, and biological factors play in shaping the infant's social network and experience? Knowledge of infants' and toddlers' social partners is central to understanding development because social partners play an important role in shaping infants' and toddlers' representations of self and the social world, their social, emotional, and cognitive capacities, and their affectionate relationships with other people. In this article we describe the social experience of Efe (Pygmy[1]) infants and toddlers, and we examine the social ecological factors associated with their activities. Our findings raise questions concerning popular models of early social relationships and suggest an alternative way of thinking about the social world of children.

Until recently, scientific accounts (varying in theoretical orientation and relying on different empirical evidence) of the infant's early social experiences converged on the view that the infant progresses from a primary relationship with one individual (almost always the mother), or at most a very few individuals, to relationships with a growing number of people, most typically peers (Smith, 1980). This is an epigenetic, hierarchical view of social development. We have labeled this dominant view the continuous care and contact model (CCC; Tronick, Morelli, & Winn, 1987).

The CCC model developed from the writings of Spitz (1965), Bowlby (1969), and Provence and Lipton (1962) on institutionalized children and is represented in the psychological views of Bowlby (1969), Ainsworth, Blehar, Waters, and Wall (1978), and Klaus and Kennell (1976) and in the ethological and evolutionary theories of Konner (1976) and Blurton-Jones (1972). Common to the different conceptual frameworks is the belief that parenting practices and the infant's capacity for social engagement are biologically based and conform to a prototypical form. Supporters of the CCC model generally recognize that the infant and caregiver are able to adjust to a range of conditions, but they consider the adjustments observed to reflect biological variation. However, more extreme views (e.g., maternal bonding) consider certain variants as nonadaptive and as compromising the child's psychological development. Bowlby's concept of monotropism is an exemplar of the CCC perspective (Bowlby, 1969).

Research that was seen as providing critical support for the CCC model was conducted by Konner (1972) on the !Kung, a savannah-dwelling gathering and hunting community. The !Kung way of life was regarded by many as prototypical of forager populations, past and present. Researchers believed that studying extant foragers provided an opportunity to learn about the environmental constraints acting on our ancestors (referred to as the environment of human adaptedness, Bowlby, 1969) and the strategies they developed (including parenting strategies) to deal with these constraints. Important to the CCC

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[1] The Efe are commonly referred to in the literature as pygmies. We have chosen to use this term sparingly. Although the term *pygmy* is informative to the reader, it is considered pejorative by the Efe.

model was Konner's observation that !Kung infants were in physical contact with their mothers 70%–80% of the time over the lst year of life. In the 2nd year of life, !Kung children's social network expanded to include mixed-age peers, and interactions with peers occurred most often in the context of play.

Clarke-Stewart's (1973) work on the early social experience of U.S. infants was also cited by proponents of the CCC model as supporting their position. U.S. infants from 9 to 13 months were observed by Clarke-Stewart as spending about 84% of their time in the same room as their mothers (53% of this time was spent within arm's reach of her). By 16 to 17 months of age, this figure rose to 77% (45% of their time was spent within arm's reach of their mothers). In contrast, only 1.7% of 9- to 13-month-olds' and 2.2% of 16- to 17-month-olds' time was spent in social activity with individuals other than their mothers.

The research on infant attachment relationships also reflects the centrality of the mother in our theorizing on early infant social development. Most of the studies on attachment that use the Strange Situation (and other procedures such as the Q sort) are predicated on the assumption that mothers are central to the infant's developing capacity for social and emotional engagement. And most of the communities studied, whether in the United States or other Western and non-Western communities, are technologically complex. However, recent work conducted outside of the United States on communities that differ in technological complexity shows that the early social experiences of infants and young children vary worldwide. Fathers (e.g., Harkness & Super, in press; Hewlett, 1991; Lamb, Pleck, Charnov, & Levine, 1987), men (Morelli & Tronick, 1992), siblings, and other children (e.g., Weisner & Gallimore, 1977; Whiting & Edwards, 1988; Zukow, 1989) have been shown to be actively involved in the care and entertainment of infants and young children.

The views represented by the CCC model cannot deal adequately with the diversity in parenting practices and are therefore too narrowly drawn. A broader view is developing that is sensitive to the role of sociocultural and ecological factors in shaping the child's social experiences as well as to the mutual influence of the child and his or her partners in shaping the quality of their social exchanges. This view easily incorporates the variation observed in caregiving patterns cross-culturally. One example of this perspective is the caretaker–child strategic model (Tronick et al., 1987), which proposes that the strategies infants use to solicit physical and psychological resources from their caregivers, and the strategies caregivers use to provide infants with those resources, are adapted to and shaped by a complex set of factors.

The basic tenet of the strategic model is that infant social engagement occurs in an interactive context where the motivations and goals, opportunities, and constraints for interaction differ between infant and caregiver; where social factors such as group composition, values, and customs promote particular child-rearing patterns; and where ecological variables such as climate, food supply, and environmental risks affect the work effort of caregivers and the types of protection and care they must provide to infants. According to this perspective, ways of thinking, feeling, and behaving are shaped by community-based processes that reflect the fitting together of caretaker and child strategies.

Our earlier observations on Efe infants from birth to 4 months of age are consistent with the emerging view on early infant development and parenting practices (Tronick et al., 1987). We described an extensive pattern of multiple caretaking of infants, one in which infants from birth to 4 months were engaged with individuals other than their mothers more than 50% of the time. Moreover, and perhaps more important, Efe infants interacted with five or more different individuals per hour, and infants were nursed by individuals other than their mothers. The pattern of multiple care of the young infant is the most extensive yet described. We believe that this system of care is associated with other aspects of the community's functioning (e.g., the diverse work demands on adults and the perceived roles and responsibilities of community members), reflects the community's valuation of sharing and cooperation, and helps prepare Efe children for participation in this intensely social society. In addition, the Efe multiple caretaking system seems to protect infants from the common hazards of the physical environment.

There is little tension between (a) the more recent findings on the variation observed among communities in parenting practices and the arrangement of infants' social activities and (b) the emerging socioecological perspective on the infants' developing relationships with other people. This perspective questions the constraints imposed by the CCC models, especially the notions of the child's limited capacities to form relationships, the concept of a prototypical form of social development, and the tendency of the CCC models to emphasize biology over culture. For example, Lewis (1990) suggested that infants are capable of forming simultaneous relationships with other individuals but that these relationships may be relatively independent of one another in terms of their influence on the child's development. This view is in marked contrast to the epigenetic, sequential perspective of relationships proposed by the CCC models.

Here we report on the social relationships of Efe infants and toddlers to extend our understanding of the social experiences of children growing up in a forager community and to continue to explore the issues raised by the socioecological perspective.

The Efe Forager Community

The Efe are a group of foragers living in the northeastern region of the Ituri forest of Zaïre. They establish transient settlements (i.e., camps) in small areas of the forest that are cleared of vegetation. Camp membership averages around 20 individuals and is made up of several extended families and a few visitors. The group is usually composed of brothers and their wives, children, unmarried sisters, and parents. Although descent is recognized patrilineally and resident patterns are virilocal, maternal relatives may live in the natal camp because of the common practice of exchanging brides across clans (i.e., sororal marriage exchange).

The Efe build leaf huts that are used primarily for sleeping, food storage, and protection from inclement weather. The huts are typically arranged in an open semicircle around the camp's perimeter, creating a shared communal space where most day-to-day, in-camp activities occur. Because most daily in-camp activities are performed outside within this communal space, they are in clear view of other camp members.

The rate of fertility among the Efe is extremely low. A recent study found that the average postmenopausal woman had experienced only 2.6 live births (Ellison, Peacock, & Lager, 1986). This pattern of infertility, however, is bimodal, with some women bearing many offspring and others bearing none. Of those women who bear children, the average interval between births is 3.2 years, which suggests that fertile women may often have relatively large families. The patterning of mortality among the Efe appears to be high throughout the life span.

The Efe subsist mainly by cooperative bow hunting with metal-tipped arrows and by gathering forest resources such as nuts, fruits, and honey. A considerable portion of their diet is also composed of cultivated foods obtained through the exchange of forest products or labor with neighboring Lese horticulturalists (Bailey & Peacock, 1988). To meet the unpredictability and seasonality of food resources, the economic activities of both Efe men and women are diverse. There is also overlap in the subsistence activities of individual camp members. Men most often bow hunt cooperatively in small groups with other men who live in the same camp or with men from neighboring camps. The work load of Efe women is very high. Women often engage in multiple activities and spend a considerable amount of time gathering food and fuel and preparing the food that they have acquired (Peacock, 1985). This work is typically conducted in the company of other women and children. Parties of women travel together with their children in the forest to collect seasonal fruits, nuts, and mushrooms, cooperatively fish in small streams, and work side by side in the gardens of their Lese horticultural neighbors. Men may accompany their wives foraging, especially if the resource is particularly risky to acquire, such as palm fruit, which requires scaling trees to a significant height. On the other hand, women rarely accompany men on hunts; when they do, they do not kill game but serve primarily as beaters to flush the animals out toward the bowmen.

Day-to-day activities do not appear to be highly coordinated among individual camp members. During the mid-morning and early afternoon hours when most out-of-camp activities take place, one or several individuals are likely to be found in the camp resting, taking care of children, preparing food, or socializing. The nearly continuous presence of people in the camp may provide mothers with an opportunity to leave their children in camp while they engage in such out-of-camp activities as foraging for forest foods or working in gardens.

Daytime camp activities are highly varied; nighttime activities tend to be less varied. Typically, nighttime activities center around consumption of the day's last meal at about dusk, followed by storytelling and singing or dancing for a few hours into the night. During this time, infants often nurse themselves to sleep, draped across their mothers' laps; toddlers and older children may hover close to their family's campfire, or they may play, but this is difficult unless the moon is full and high enough to cast light into the clearing. Children may fall asleep, but more often they wait until the family beds down. At night, camp members often wake several times to stir the coals and add fuel to the smoldering fires, to converse with each other, to play instruments, or to sing. The infants may be passed to a familiar caregiver, such as a sister or an aunt, to play or sleep for some period. Toddlers may also freely change their sleeping arrangements during the night to be with others.

Efe infants and children have diverse opportunities to be socially and physically involved in ongoing daily camp activities with a variety of community members. This is true whether the child is in the camp (Morelli, 1987, found that infants and toddlers spend most of their time in the camp) or foraging with other people (usually caregivers and children). For the infant, the distinction between daytime and nighttime events is not sharp, and social activities continue throughout the night.

Method

The work reported here is based on data collected during two separate field trips to Zaïre. The aim of the first study, which was conducted in 1981–1983, was to describe the social arrangement of Efe 1-, 2-, and 3-year-old boys' and girls' everyday lives (Morelli, 1987). The second study, conducted in 1988–1989, was designed to broaden our understanding of the development of Efe forager children's relationships with community members by examining the social lives of 5- to 18-month-olds. Only data on 5- and 8-month-olds are reported from the most recent study.

The same field site was visited for both studies, and many of the same camps and families participated in the two projects. There were few, if any, changes in the life-style of the Efe within the time that elapsed between the two studies. However, the studies differed in several respects. Advances in technology made it possible to collect data in 1988–1989 with a lap-top computer that enabled us to record the actual duration of different activities. More traditional methods of coding were used in 1981–1983; data were collected using paper and pencil, and timed at 1-min intervals. Furthermore, the amount of time that children were observed and how the observations were distributed over the day were not the same for the two studies.

Study Site

The Ituri forest is surrounded by savannah in the north, highlands in the east, and the central lowland forest in the south and west. The average yearly temperature is around 31°C, humidity averages 85%, and annual rainfall is 1,900 mm. Research was conducted from the Ituri Project research station along a stretch of road spanning 36 kilometers.

Children Observed

Six 5-month-olds (4 girls and 2 boys), eleven 8-month-olds[2] (6 girls and 5 boys), eight 1-year-olds (4 boys and 4 girls), seven 2-year-olds (3 boys and 4 girls), and eight 3-year-olds (4 boys and 4 girls) participated in the two studies. In each study, behavioral observations were collected in 12 Efe camps (representing about 75% of the camps located in the study area).

Infant birth dates were often known within a few days because researchers were residing in or near the camp when the births took place. Birth dates of older infants and toddlers, if unknown, were determined using records maintained by researchers living at the field site since 1979 or by asking camp members if the child in question was born before or after children whose birth times were known. Both procedures allowed us to estimate births to at least the nearest month.

Frequent social visits were made to all Efe forager camps located in

[2] Five of the babies observed when they were 5 months old were also observed when they were 8 months old.

the study area between 5 and 7 months before data collection began. Visits often included living with camp members for several days, accompanying women with infants on foraging expeditions, and following young children playing outside the camp perimeter. The success of the habituation process was measured by the observer's diminishing effects on the behavior of camp members, including children and infants. After data collection began, camps continued to be visited regularly. The villages of Lese farmers, with whom the Efe associate, were also visited during this time.

Behavioral Observations

Data collection. Infants' and toddlers' activities were recorded using a focal subject sampling technique (Altmann, 1974). The Efe's use of space and their views regarding privacy made it easy to follow children wherever they went—in their huts, to the river to bathe, or foraging with women. There were times when the researcher lost sight of a child for a few minutes because the child ventured behind a tree or hut; the researcher noted this in her field notes and moved to an area that allowed better viewing. A record was kept noting why and for how long a child was out of view of the researcher.

Efe infants (5- and 8-month-olds) were each watched for eight 15-min observation sessions (a total of 2 hr of observations on each infant at each age). Behaviors were continuously coded on a lap-top computer that recorded real time, which facilitated the calculation of the absolute duration of events. Toddlers (1-, 2-, and 3-year-olds) were each observed for six 1-hr observation sessions. All occurrences of a behavior were coded using prepared data sheets, and the sequence in which behaviors occurred was preserved. Time was marked at 1-min intervals.

All observations were evenly distributed across the daylight hours to obtain a representative sample of each child's daily activities. Data collection started between 6 a.m. and 7 a.m. and ended between 5 p.m. and 6 p.m. when the sun set. Most of the Efe's activities occur during these times because the only source of light for the Efe at night is the glow of campfires or the moon. A minimum of 2 days was required to complete observations because of the rules governing data collection; no more than 15 days elapsed between a child's first and last observation sessions.

Behaviors recorded. Comparable measures were created to study infants' and toddlers' levels of social activity with community members. The first measure, social contact, describes children's affiliative and physical activities with others and includes behaviors such as care, play, groom, share, watch other people, and physical contact. A second measure, solitary activity, reflects the amount of time that infants and toddlers spend in activities that do not involve another individual. This measure does not imply that the infant or toddler is out of the view of others but only that he or she is not in interaction with them.

For infants (5- and 8-month-olds), the amount of time spent in social contact and solitary activity equals the sum duration of the events that make up each of the two categories. For toddlers (1-, 2-, and 3-year-olds), social contact is measured by the number of 1-min intervals in which the relevant codes appear. Solitary activity is measured by summing the number of intervals in which solitary codes appear to the exclusion of other codes in the interval. Measuring solitary activity in this way takes into consideration the nature of interval data; that is, for behavioral events that occur with high frequency but for short durations, the addition of all intervals in which that event occurs will tend to overestimate the total time for that event. This behavioral measurement strategy reflects the physical and social life of Efe children, where individual children move frequently between different kinds of social activity but where solitary activity, "off time" away from physical or social contact with others, is often brief.

Social partners. Four categories of social partners are considered in this article: mother, father, adults (individuals over 15 years), and children (individuals between the ages of 1 and 15 years). The amount of time (or the number of intervals) Efe infants and toddlers were in contact with their mothers, fathers, adults, and children and the number of different adults and children with whom they were in contact were calculated. The values created by this procedure were used to determine the average and total person score for each 15 min (or 1 hr) of data collection. Each of the four resulting measures was summed and divided by the number of hours the child was observed to produce mean hourly rate scores.

It is important to note that it is not unusual for Efe infants and toddlers to be involved in multiparty interactions (i.e., involved with more than one individual at a time). Therefore, when the mean percentage of time infants or toddlers are in social contact is summed across mother, father, adults, and children, the figure may actually exceed 100%.

Conceptualizing social partner's participation in activity. We developed an analytic approach that we think provides a more revealing measure of the child's social experience than approaches more commonly used. Typically, questions about with whom the child spends his or her time are addressed by calculating the proportion of total time (often measured in intervals per hour) the child spends with the father, the mother, other adults, and children. Such a measure might indicate that the infant is with the mother 30% of the time, the father 20%, other adults 25%, and so on. But these categories are obviously not equivalent from either an analytic or a psychological perspective. There is only one mother and father, but there are many adults and children. It is possible, for example, for a child to spend less time with the father than with other children but nonetheless to spend more time with the father than with an individual child. This raises the question of how the infant experiences his or her father relative to another and to others. The infant may perceive his or her father as a distinct individual compared with another individual child, even though the infant spends more time with other children. Thus, traditional measures of time spent with community members compare singular (e.g., father) with multiple classes of social partner (e.g., children) and provide us with one way to make sense of the child's experience of community members. But traditional measures may not capture critical aspects of this experience.

In an attempt to deal with the problems arising from traditional analytic approaches, we developed a measure that compares the time (measured in intervals per hour and referred to as a rate score) the infant spends with the father and the mother with the time he or she spends with the average person (e.g., adult or child). The average person score is simply generated by computing the total time the infant is with some category of person (e.g., adults or children) and dividing it by the number of different individuals belonging to that social category who are involved with the child. By comparing the infant's experience of the father with the infant's experience of the average adult or child we are able to evaluate the relative distinctness of the child's experience of these individuals.

The amount of time an Efe infant or toddler spends with mother, father, adults, and children, referred to as the total person score, was also calculated because the measure provides another way of conceptualizing the child's experience of others. Although the two measures reflect meaningful differences for the infant and toddler, when considered together they provide more inclusive information about the nature of a child's partnership with different community members.

Reliability. Interobserver reliability was established in the field with a colleague trained in the use of the coding scheme. Observations

were made in the field and from videotapes that were created for the purposes of training and reliability. Reliability sessions were conducted prior to the beginning of the study, intermittently during the study, and following the completion of data collection. A total of 420 min of observations were used to calculate Cohen's kappa. Data collected during these sessions were not included in subsequent analyses. The mean kappa coefficient for the behaviors of social contact and solitary activity was .88 (.96 for data collected on 5- and 8-month-olds and .80 for data collected on 1-, 2-, and 3-year-olds).

Analyses

Linear orthogonal polynomial contrasts were performed using one-way analyses of variance to describe age-related changes in the amount of time infants and toddlers spent in social contact. Paired *t* tests were used to compare social partners' involvement with children at 5 months and at 3 years of age. Only findings significant at $p \leq .05$ are reported.

Results

Efe children's relationships with community members were studied by examining (a) how infants' and toddlers' level of social contact changed over the first 3 years of life, and (b) how infants' and toddlers' contact with their mothers, their fathers, other adults, and children shifted during this time.

Age-Related Changes in Children's Solitary Activities and Social Contact

Solitary activities. Efe children's involvement in solitary activities increased as they grew older (Table 1); the linear trend was significant, $F(35, 39) = 11.73$, $p = .003$. Five-month-olds spent less than 1% of their time in the absence of a companion. By comparison, 3-year-olds were observed 10% to 22% ($M = 16\%$) in activities that did not include another individual. Efe infants are rarely put down on the ground; rather, they spend much of their time being held by a caregiver (Tronick et al., 1987). This practice may help explain the low level of solitary activity observed early in life.

It is important to our understanding of the social life of Efe children to note that infants' and toddlers' involvement in solitary activities does not reflect the amount of time that they are unattended or alone. Efe children are embedded in a diverse and active social world in which many individuals are continuously within the range of children's sight and sound. At 1 year of age, for example, about 10 people were present within sight or close hearing range of the child (across all contexts, both in camp and out of camp). Thus although Efe children may not be engaged with someone, they are hardly alone in the sense used in the West, where an infant may be habitually out of sight and hearing of its caregivers.

Social contact. The amount of time that Efe children spent in social contact steadily declined with age; the linear trend was significant, $F(35, 39) = 39.61$, $p = .001$. Five-month-olds were in contact with one or several individuals about 96% of the time (scores ranged from 91% to 99%). By the age of 3, however, children were spending an average of 63% of their time with other individuals (scores ranged from 50% to 71%).

Children's Social Contact With Mother, Father, Children, and Adults

Age-related changes in social contact with mothers and fathers.[3] The data for this section are presented in Figure 1. The amount of time Efe children spent with their mothers declined by 30% over the first 3 years of life; the linear trend was significant, $F(35, 39) = 12.59$, $p = .001$. Mothers were their infants' social partners for about 50% of the time that 5-month-olds were observed; the range of scores for the 6 Efe babies was 36% to 70%. Three-year-olds, in contrast, were recorded in social contact with their mothers about 21% of time; children's scores ranged from 14% to 40%.

Age-related changes in the amount of time Efe infants and toddlers spent in social contact with their fathers were not significant. Six percent of a 5-month-old's time, and 9% of a 3-year-old's time, was spent in contact with the father.

Age-related changes in social contact with children and adults. The amount of time Efe children were in contact with children tripled over the first 3 years of life; the linear trend was significant, $F(35, 39) = 5.83$, $p = .002$. Children were seen with 5-month-olds about 29% of the time and with 3-year-olds 62%. However, time spent with adults did not change significantly with the age of the child. Adults were observed in contact with 5-month-olds about 18% of the time. This figure rose to 26% for 3-year-olds.

Comparison of companions at 5 months and at 3 years. More of a 5-month-old's time was spent with the mother than with the father, $t(5) = 6.37$, $p = .001$, or other adults, $t(5) = 4.44$, $p = .007$; and more time was spent with children than with the father, $t(5) = -4.83$, $p = .005$. However, infants' levels of social contact with mothers and with children did not significantly differ. About half of an Efe infant's time was spent with the mother, and about one third of the infant's time was spent with children. No significant differences were observed when children and adults, or adults and father, were compared.

By the age of 3, Efe children were more likely to be in social contact with children than with any other class of individual: mother, $t(7) = -4.66$, $p = .002$; father, $t(7) = -5.9$, $p = .001$; or adults, $t(7) = -3.1$, $p = .017$. Three-year-olds were also more likely to be in contact with their mothers than with their fathers, $t(7) = 3.47$, $p = .01$. (Differences between the mother and other adults, and between the father and other adults, were not significant.) About 62% of a 3-year-old's time was spent with children, 26% with adults, 21% with the mother, and 9% with the father.

[3] In a separate manuscript (Morelli & Tronick, 1992) we describe age-related changes in fathers' involvement with 1-, 2- and 3-year-old Efe children. The measure used to describe these changes is different from the measure of social contact discussed in this article (where no age-related changes were observed).

Table 1
Mean Percentage of Time Infants and Young Children Spend in Solitary Activity and Social Contact With Social Partners

	5 months		8 months		12 months		24 months		36 months	
Score	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
					Solitary activity					
Total	0.1	0.2	6.6	7.3	8.2	3.2	13.0	2.8	15.8	4.1
					Social contact					
Total	95.9	2.7	89.6	8.9	70.5	6.9	63.5	4.9	63.2	7.1
Mother	49.4	14.9	62.9	18.8	49.0	13.7	28.1	10.2	21.3	8.5
Father	6.0	7.9	3.0	5.2	11.3	5.1	12.1	10.2	8.8	8.9
Adults	17.6	9.2	15.9	15.7	27.5	16.0	20.6	24.8	25.8	19.5
Peers	29.1	12.3	23.3	17.4	39.2	11.7	52.9	30.3	62.4	21.4
Adult *M*	4.2	2.5	4.8	5.1	8.4	4.3	4.7	3.2	6.1	4.3
Peer *M*	9.4	9.1	4.8	4.6	11.0	3.4	13.3	5.3	17.5	10.1
No. adults	1.9	1.2	1.7	1.6	3.5	1.2	3.3	1.9	4.0	1.9
No. peers	2.3	1.3	2.9	1.5	3.7	1.0	3.9	1.3	4.0	1.6

Note. Scores do not add up to 100 because of the scoring of multiple simultaneous partners.

Children's Social Contact With the Average Peer and the Average Adult[4]

The amount of time that Efe children spent in social contact with the average peer increased significantly with age, $F(4, 35) = 4.47$, $p = .005$. Whereas 5-month-olds spent 9% of their time with the average peer, 3-year-olds spent 18% of their time. No significant differences were found, however, in the amount of time that the average adult spent in social contact with children over the first 3 years of life.

The amounts of time that 5-month-olds spent with the average peer (about 9%), the average adult (about 4%), and the father (about 6%) did not significantly differ. However, infants at this age spent more time with their mothers (about 49%) than with any average individual: average peer, $t(5) = 4.98$, $p = .004$; average adult, $t(5) = 7.88$, $p = .001$.

By the age of 3, children's level of social contact with the average peer (about 18%) was similar to their level of contact with their mothers (about 21%) as well as with their fathers (about 9%). Furthermore, the average peer was observed more often in partnership with 3-year-olds than with the average adult, $t(7) = -3.2$, $p = .015$. However, 3-year-olds continued to spend more time with their mothers than with the average adult, $t(7) = 4.34$, $p = .003$, and fathers continued to be like the average adult on this measure.

Age-Related Changes in the Number of Children and Adults in Social Contact With Children

The number of different children with whom children were observed in an average hour showed no significant changes with age. From 1 to 4 different children were observed in social contact with 5-month-olds, and from 1 to 6 different children were observed with 3-year-olds.

By comparison, Efe children spent more time with a greater number of different adults as they grew older, $F(4, 35) = 3.44$, $p = .018$. In an average hour, 5-month-olds were likely to come into contact with from 0 to 4 adults, whereas 3-year-olds came into contact with from 2 to 7 adults.

Discussion

Efe infants' and toddlers' experience of a diverse array of social contact with many individuals begins during the newborn period, in which there is extensive handling and passing around of the neonate (Tronick et al., 1987), and continues over the first 3 years of life. Efe infants and toddlers spend almost all of their time in social contact with other individuals, and although the amount of social contact declines with age, 3-year-olds still spend most of their time in physical and social contact with other people.

Of particular interest was the finding that Efe infants and toddlers spend about half of their time in social contact with individuals who are not their mothers; this figure rose to 70% for 3-year-olds. An important class of social companions was children, who were seen in social contact with Efe infants and toddlers about one third of the time. As infants get older, social contact with other children becomes even more pronounced so that by 3 years of age, they spend about 60% of their time with other children. By comparison, social contact between Efe infants and toddlers and their fathers and other adults remains fairly constant over the first 3 years of life. It is critical to note that similarities were seen in the amounts of time infants and toddlers spent with their fathers, with the average child, and with the average adult (at 5 months of age and at 3 years of age), which suggests that the Efe infants and toddlers may perceive these different social partners as relatively equivalent.

These findings describing the intensive and extensive social contact of Efe infants and toddlers still fail to convey the richness of these children's social experience. Efe infants and toddlers are almost never alone in the sense of being out of sight

[4] The data for this section are presented in Figure 2.

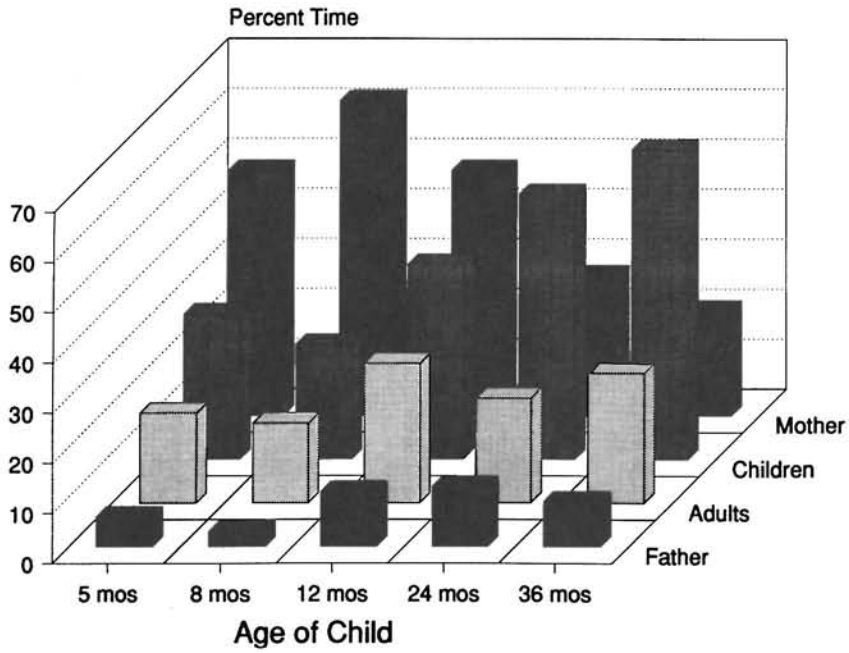

Figure 1. Percentage of time mother, father, adults, and children spend in social contact with Efe infants and toddlers. (mos = months.)

or hearing of other people. The social and work relationships that Efe community members have with one another are publicly enacted both in and out of the camp setting, and these people are often the same individuals with whom the Efe infants and toddlers participate in activities. Thus, the people the infants and toddlers regularly interact with are also the people who regularly surround them.

The developmental course of the Efe infants' and toddlers' social relationships does not conform to the patterning of relationships predicted by CCC models of development and leads

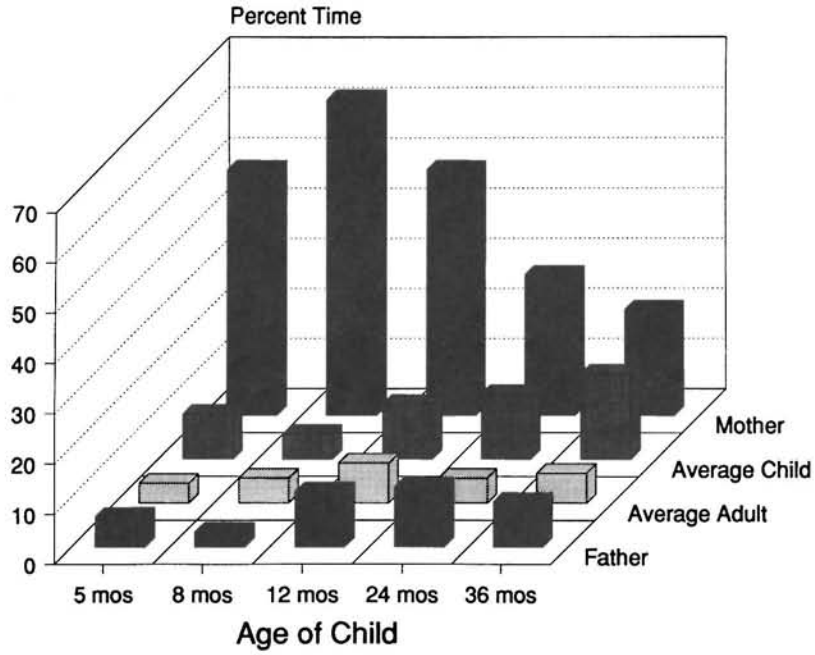

Figure 2. Percentage of time mother, father, the average adult, and the average peer spend in social contact with Efe infants and toddlers. (mos = months.)

us to reflect (a) on the sociocultural and ecological factors associated with the arrangement of Efe infants' and toddlers' social activities, and (b) on the way in which these social relationships affect how Efe infants and toddlers come to represent themselves in relationships with other community members.

The social ecology of the Efe, adults and children alike, is characterized by intense social contact. The physical environment of the camp is arranged so that the activities of others are within clear view and hearing of all camp members. The varied work schedules of adults mean that individuals are almost always engaged in an activity within the camp perimeter during the day. The in- and out-of-camp economic activities of both men and women are also highly cooperative. Men most often hunt in small groups, and women forage in the forest or work in the gardens of neighboring horticulturalists in the company of several other women and their children. Efe adults must manage diverse multiple relationships to gain access to social, psychological, and often unpredictable material resources. Their effectiveness at negotiating interactions with other camp members, kin, affiliatives, Lese farmers, and visitors in a culturally appropriate manner is fundamental to Efe economic and social success.

These socioecological features are associated with the physical ecology of the Efe environment, the low fertility and high mortality rates, and the economic activities of adult community members. Efe mothers have very heavy work loads. They often engage in multiple tasks and even within the camp context are busy preparing food and maintaining material goods (Peacock, 1985). Efe women often forage within a short distance (e.g., a half hour's walk) from the camp, and adults and children may tend infants and toddlers in camp or follow to monitor them in the forest or garden while their mothers work nearby. By contrast, !Kung mothers must take young infants with them during foraging trips because of the distances of foraging patches from camp, distances too great for mothers to return to camp to nurse or console a distressed infant or for child caregivers to follow and provide help. Among the Aka, women commonly participate in net hunting in groups with adult men, and infant contact with fathers, especially during hunts, is relatively extensive (Hewlett, 1988). Aka mothers and fathers appear to be central in the life of their infants, who experience care from both of them in and out of the camp.

Demographic factors also may play a role in the availability of alternative caregivers among the Efe. The high rate of mortality among adults results in a pool of parentless or single-parented children who are fostered by paternal or maternal relatives. These children may provide significant amounts of care and attention to infants and toddlers. The bimodal pattern of fertility among the Efe also increases the availability of adults who are not encumbered with children of their own. However, from previous work we know that low fertility does not fully account for the pattern of care among adults, because reproductively active females among the Efe also commonly provide care to the infants of others as well as to their own (Tronick, Morelli, & Winn, 1989, in response to Hewlett, 1988).

The tropical rain forest also poses unique challenges to the Efe. Malaria, filariasis, schistosomiasis, and intestinal parasites are some of the many illnesses that continually plague the Efe. Moreover, the Efe's ability to ward off disease is often compromised by their sometimes poor diet. It may also be that the Efe pattern of child care is a hazard-prevention strategy that serves to buffer vulnerable infants and toddlers from such health risks (Tronick, Winn, & Morelli, 1985). Recent studies demonstrate significant variation in the child-rearing practices among hunters and gatherers. Intensive mother–infant contact has been described for the savanna-dwelling !Kung (Konner, 1976) and for the South American forest group known as the Ache, whose children up to 2 years of age were observed in physical contact or within arm's reach of their mothers almost continuously (Kaplan & Dove, 1987). Multiple caretaking, although less extensive than that described for the Efe, is practiced among the Aka of the Central African Republic (Hewlett, 1988), the Tiwi of Australia (Goodale, 1971), and the Philippine Agta (Estioko-Griffen & Griffen, 1981). The Efe may represent an extreme on the multiple-caretaking continuum, with extensive care provided by many individuals other than the mother. But the Efe patterning of social relationships is clearly no more prototypical than that of any other foraging people. Rather, it appears for the Efe and other communities as well that caretaking patterns are socially constructed in the engagement of individuals with their social and physical ecologies. A community-unique pattern of engagement will be associated with unique developmental experiences and forms of representation of self and others. What might these look like for Efe infants and toddlers?

The patterning of Efe community members' social and work activities provides Efe infants and toddlers with opportunities to manage multiple relationships with men, women, boys, and girls from birth onward. The challenges associated with interacting with different people, each of whom brings his or her personal way of handling social engagement, may foster in the Efe infant a broad array of social skills, including the regulatory capacities needed to control normal interactive stresses (Tronick, 1989). Infants' and toddlers' relationships with other children may be particularly important in this regard because children are generally thought to be less sensitive to the signals and needs of infants and toddlers, who thus make greater demands than adults would on their social capacities (Rogoff, 1990). But that may not be the case for the Efe. It may be that Efe children, given their own early extensive social experience, are as sensitive as adults are or are at least far more sensitive than children without as much early interactive experience.

The two features of the Efe infants' and toddlers' experience described here—the multiplicity of social relationships and the constant presence of others—may be related to the infants' and toddlers' emotional relationships with other people and to their sense of self. Multiple sensitive interactants may buffer infants and toddlers against feelings of insecurity and lead to an enhancement of self-confidence. Efe infants and toddlers may represent their social world as a landscape populated with secure bases such that their experience of the balance between security and insecurity will be strongly weighted toward security. This balance may allow them as children, and then later as adults, to more readily explore their social and physical environment.

These representational and affective qualities are tied to the almost constant presence of others. The ability of Efe infants and toddlers to self-regulate and their sense of self, the sense of

who they are as individuals, are likely to be linked to the presence of others. Thus Efe children may be less likely to elaborate their own regulatory functions, such as the regulation of need or affective states (Tronick, 1989). They may be more dependent on others to provide external regulatory input to aid in the accomplishment of these regulatory goals, in contrast to children who are left alone more often and thus must more fully elaborate their own regulatory capacities independent of others. These characteristics may make children particulary vulnerable to a feeling of affective dysregulation and distress—a loss of a sense of self—when out of the presence of others and, as they get older and become adults, even to the thought of being alone. Indeed, this vulnerability of their sense of self might well provide the motivational basis for the need to be with others and the tolerance for the intense social contact with others seen among the Efe.

In previous work we argued, like Bettleheim (1969) did for the effect of kibbutz child rearing on the later intensity of adult relationships, that the multiplicity of relationships for the Efe might result in a decrease in the intensity of the affective relationship with any one individual (Tronick et al., 1985). However, we now realize that this argument assumes (a) a fixed amount of emotional resources that can be invested in relationships and (b) that infants and toddlers have only limited capacities for social and affective interaction in multiple relationships. Although infants are now credited with more interactive skills than described just 20 years ago, both of these assumptions remain untested (Smith, 1980). Thus it may be that Efe children and adults experience many affectively intense relationships, each of them equivalent in intensity to the relationships that characterize individuals who have only a few intimate partners.

Much of our current theorizing, from object relations to social cognition theory, argues for an epigenetic, hierarchical sequence of relationships, that is, argues that the child's earliest relationship(s) with the mother and the father tend to structure his or her later relationships. For example, attachment theorists see the quality of the child's attachment to the mother as a critical feature of the child's working model of later social relationships. The Efe infants' and toddlers' pattern of social relationships over the first 3 years of life is not easily characterized as a hierarchical, epigenetic sequence. Rather, during development, Efe infants and toddlers experience a changing pattern of multiple, simultaneous relationships, many of which continue into adulthood. Each of these relationships may have independent developmental effects and consequences for later relationships (Lewis, Feiring, & Brooks-Gunn, 1988). Given these data, one might wonder if the assumption of an epigenetic, hierarchical sequence is itself culturally bound.

The Efe pattern of care lends support to a socioecological model of caretaking and infant development in which variation in the caretaking patterns and interactive strategies of parents and other community members are seen as affected by social and physical ecological factors. Within specific caregiving environments, children use resource acquisition strategies that are adapted to the social opportunities and constraints presented to them by the community. As a consequence of a process of mutual regulation, in which individuals in social interaction negotiate their own motivations and goals with those of others, children develop culturally appropriate motivations and behaviors, appropriating knowledge of themselves and the social world. This process, thus, is community specific, resulting in individuals who have a sense of self and others that is also community specific. Moreover, these observations on the Efe and other foraging societies suggest that some of the assumptions of our theories are too specific to certain communities, such as technologically advanced Western societies, and that they need to be modified and broadened to account for other patterns such as the simultaneous multiple relationships of the Efe.

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