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2. A Biocultural Approach to Sex, Love, and Intimacy in Central African Foragers and Farmers

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Bembe created the earth. He created women. He then created men but he kept them away from the women. One day a man called Tole took all the men in his camp and started to hunt in the forest. They had no women with them, only calabashes they put on their chests to be like a woman. They hunted animals and ate them, all the men together. The next day Tole went alone into the forest, very early, and he listened and heard sounds he had not heard before. All the women were there. They had made a raft on the water and the women were playing on it. Now he hid and thought to himself, these are not men, but they are like men, only they have breasts. Something is wrong with their chests and they have no testicles, it is only flat. He crawled on his knees to catch one. The women were singing and playing on their raft and did not hear Tole. He tried to trap one, but they all ran to their hut. So the women went to their camp, and Tole went to his camp and told his friends, "I saw other people who have no testicles and have things pointing from their chests. Let's go and get them and find out what they are." It is because of Tole that men know women and women know men.

—*Aka story*

This chapter examines sex, love, and intimacy in married couples in two central African ethnic groups—Aka foragers and Ngandu farmers. New data on love and jealousy emerged during life history interviews, and we summarize that sexual behavior data here. Our research is designed

(i.e., cooperative labor a few times a year). Individuals who do not share and accumulate food or material items are suspected, or are targets, of sorcery, which is believed to cause illness or death. These beliefs and practices help maintain household equality and are deterrents to accumulation.

The Aka have one of the most egalitarian cultures in the ethnographic record. The egalitarian status of Aka men and women is in part related to their subsistence patterns of net hunting and gathering. Men and women contribute equal amounts of calories to the household diet. The contribution varies according to their seasonal movements. When the Aka are working in the villagers' fields and living in village camps, the women bring in more "village" foods, in the form of carbohydrates, as food is exchanged with other villagers for labor. The men's contribution increases once the couple and any children have moved back to their forest camp. Women frequently join in the net hunt (generally the whole family participates), and it is not uncommon to see a woman with a knife or spear in one hand and a baby in a sling in the other. Men join in the gathering of forest plants, tubers, and nuts. The women generally control the distribution of food sources, both meat and plant, although men and women have equal access to available resources. Aka men provide more direct care to infants than fathers in any other systematically studied culture (Hewlett 1991). The Aka are also characterized by extensive gender role flexibility. Women and men regularly switch subsistence and child-care roles.

Strong patriclan social organization among the Ngandu emphasizes deference and respect by women and children for elders, males, and ancestors; consequently, marked gender inequality exists. For example, men are expected to receive larger portions of food; women cannot touch hunting implements (guns and spears); women seldom occupy political positions, such as village chief. Violence against women is not unusual. The number and age of geographically close male kin are important (e.g., male-male alliances), because the Ngandu accumulate goods and property (e.g., planted crops) that must be guarded from others. Also intra- and intergroup hostilities in regard to women are not uncommon, as a little less than half of all marriages are polygynous, leaving many men without a spouse, which in turn often leads to conflict and violence.

Ngandu men and women have sharply delineated gender roles and status. Ngandu women are the primary providers of calories to the diet, in the form of carbohydrates obtained from the fields they have planted, weeded, and harvested throughout the year. Men's work tends to be more seasonal;

during the dry season the Ngandu men clear the fields for the women to plant. Men generally are involved in the weeding and harvesting of coffee crops, if the Ngandu family has coffee fields. Women take part in an informal market economy by selling their farm products, such as manioc, peanuts, corn, plantains, and palm oil, and forest products that they received in trade with the Aka. A few Ngandu women also distill and sell corn alcohol or they sell meat their husbands have obtained by trading for clothes, medicine, or manioc.

The Ngandu promote social unity and conformity, in contrast to the Aka, who encourage autonomy (Hewlett 1991).

These ethnographic backgrounds illustrate key differences in foundational schema of the Aka and Ngandu. Foundational schema are ideas, knowledge, and values that provide the foundation for cultural models (i.e., ways of thinking/explaining/anticipating the intentions and needs of others) in a variety of domains of cultural life. For instance, the U.S. foundational schema for independence shapes cultural models of child care, male-female relations, and religious beliefs. Foundational schema of the Aka include age and gender egalitarianism, an ideology of giving/sharing, flexibility of social roles, respect for the autonomy of individuals, and trust of others. The foundational schema of gender egalitarianism among the Aka shape cultural models regarding the sexual division of labor in subsistence and child-care activities, healing systems, and religious beliefs. Consistent with their egalitarian schema, the Aka avoid drawing attention to themselves, avoid ranking each other, and share extensively (Hewlett 1999). Foundational schema for Ngandu include age and gender hierarchy, deference to and respect for authority figures and older individuals (parents, older siblings), obligations to specific others (clan, lineage), a material basis for adult social relationships, and a general distrust of others (e.g., sorcery).

An Evolutionary Biocultural Model

Figure 2.1 shows the biocultural model we use to interpret our data. It is a heuristic, rather than a predictive, model—that is, it is used to generate discussion and hypotheses rather than make specific predictions, and it is based upon recent developments within evolutionary theory (E. Smith 2000). According to the model, male-female sociosexual relations can best

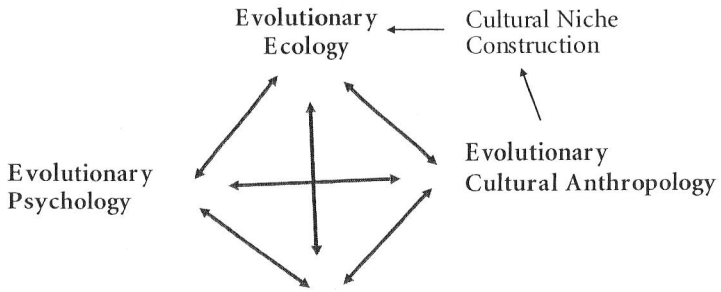

Figure 2.1 An Evolutionary Biocultural Model of Human Sociosexual Relations

be understood as the result of interactions of biology, culture, and ecology. Each evolutionary approach has distinct properties that need to be understood on their own, but most human behaviors are the consequence of interactions of these features.

Evolutionary psychology is the branch of evolutionary theory that has attracted the most attention and controversy, in part because this approach focuses on identifying biological (i.e., genetic) behaviors of humans. Most this research centers on understanding "human nature" and universals that evolved during the environment(s) of evolutionary adaptation, the hunting-gathering lifestyle that characterized more than 90 percent of human history. Evolutionary psychologists are interested in identifying biologically based human behaviors that evolved in order to solve recurring problems in environment(s) of evolutionary adaptation. Some behaviors may have evolved in the environment of evolutionary adaptation, but others may be part of our phylogenetic history. For instance, humans share a phylogenetic history with mammals and primates, and this shared history contributes to biologically based propensities and an "evolved psychology."

In order to understand the topics of this chapter—male-female sex, love, and anger—it is essential to have a background in human evolutionary psychology and genetically based behaviors such as sexual desire, attraction to specific mates, attachment, and sexual jealousy. Sexual desire and mate attraction to specific others are common to many sexually reproducing organisms (Fisher 2006), whereas attachment is often associated with the evolution of the limbic system (e.g., emotions) in mammals and

is especially pronounced in Old World primates (the Catarrines). Sexual jealousy is particularly common in pair-bonded species in which male parental investment is high (Fisher 1992). While humans share sexual desire, attraction to specific mates, attachment, and sexual jealousy with other animals, humans have characteristics that are unique in the animal world: the ability empathize and to read the intentions of others, and the ability to acquire cumulative behaviors and knowledge (i.e., culture) (Hrdy 1999; Tomasello 1999). In our opinion, these human characteristics contributed to new configurations of sexual desire, mate attraction, attachment, and sexual jealousy. Romantic passion emerged through interactions between mammalian systems of sexual desire and mate attraction, and human abilities to empathize and idealize others. Romantic passion is a human universal as Jankowiak (1993) suggests, but it results from interactions of emergent human characteristics and is not an adaptation to a specific recurring problem in the environment(s) of evolutionary adaptation. Along the same lines, "love," and attachment to specific others, may be especially strong in humans, in part because we have the evolved cognitive and emotional structures to take on the feelings of others.

Another part of understanding the evolved biological basis of human behavior is ontogenetic development. Human biology changes with age, and this biology influences human behavior. This chapter focuses on adult patterns of sex and love; a study of children's sex and love would be very different, mostly because of ontogenetic changes in biology. In short, evolutionary psychology emphasizes the importance of understanding biologically based universal features of human behavior.

Evolutionary ecologists are different from evolutionary psychologists in that they view the human brain as a general purpose mechanism that allows humans to adapt to varied and diverse natural and social environments. Evolutionary ecologists are interested in explaining human behavioral diversity rather than biologically based human universals. Evolutionary ecology considers how organisms adapt to their environment through their interactions with members of their own species (and other species) as well as the physical environment; evolutionary ecology examines the selective pressures imposed by the environment and the evolutionary response to these pressures (Bulmer 1994). From this perspective humans try to optimize or maximize their reproductive fitness within particular social, demographic, or political environments. Few studies of human sex and love by evolutionary ecologists exist, but the evolutionary ecology research by

Belsky (1999) and Chisholm (1995) suggest that a child's rearing environment (e.g., the family's access to material and natural resources) predicts when the child will start sexual activity and how long her or his pair bonds will last. Children raised in rich environments will develop a reproductive strategy in which sexual relationships start late and male-female relationships last a relatively long time, while children raised in materially limited environments start their sexual relationships earlier and these relationships are relatively short term. Factors such as parasite loads, access to resources, and number of potential marriage partners in the area are all examples that evolutionary ecologists may consider to explain human variation in sex and love experiences.

The final evolutionary approach shown in figure 2.1 is evolutionary cultural anthropology (Hewlett and Lamb 2002). Researchers in this field focus on the evolutionary nature of culture—how is it transmitted and acquired, how it changes, and how it influences human behavior. Evolutionary cultural anthropologists point out that culture has the characteristics required for natural selection: (1) production of cultural variants, (2) fitness effects of cultural variants, (3) inheritance (i.e., transmission) of cultural variants, and (4) accumulation of cultural modifications. Population geneticists have also influenced evolutionary cultural anthropology, asserting that just as an understanding of genetic transmission revolutionized genetics, so may an understanding of cultural transmission influence cultural anthropology. Humans have different mechanisms for learning skills and acquiring knowledge because it would be maladaptive to learn everything by trial and error. Learning from parents (which evolutionary cultural anthropologists call vertical transmission) , friends (horizontal transmission), leaders (one-many transmission, indirect bias), or from all those around you (conformist transmission) can be an efficient way to learn in particular contexts. Each transmission mechanism has specific properties. Some mechanisms lead to the conservation of culture (e.g., vertical and conformist), while other mechanisms (e.g., horizontal) lead to rapid culture change. Researchers in evolutionary cultural anthropology have shown that many cultural beliefs and behaviors, especially those associated with family and kinship, are seldom linked to natural ecology and are highly conserved because of the mechanisms of cultural transmission (Hewlett and Lamb 2002). In short, the evolutionary cultural anthropology perspective suggests that culture matters.

Another component of evolutionary cultural anthropology identified in figure 2.1 is cultural niche construction. The concept of niche construction (Odling-Smee, Laland, and Feldman 2003) is a recent conceptual contribution to evolutionary cultural anthropology. Some species, including humans, modify natural selection pressures within their environments by creating a niche (e.g., burrow, nest, house) that produces a separate constellation of selective pressures (the constructed niche creates its own set of problems), which may or not enhance the reproductive fitness of individuals. Over time the niches and the consequences of the selective pressures are inherited. This is a potentially important contribution to evolutionary cultural anthropology because culture increases the ability of humans to construct niches. Technology, house types, settlement patterns, how people make a living, and political-economic institutions are part of the culturally constructed niche to which humans try to adapt. This helps to explain how culture is "out there" in the environment as well as in our minds (e.g., knowledge, information).

The major works on human sex, love, and intimacy fall into different evolutionary approaches outlined in the evolutionary biocultural model. Jankowiak (1995) uses an evolutionary psychology approach and focuses on understanding the universal and biologically based components of intimacy, while Lindholm (1998, 2000) uses evolutionary cultural anthropology (niche construction, in particular) to explain how sociocultural structures contribute to dramatic differences in human intimacy. It is important to remember that the different approaches have different aims: evolutionary psychology is trying to explain human universals/nature, whereas evolutionary ecology and evolutionary cultural anthropology are trying to explain human diversity.

We advocate an integrated evolutionary approach to understanding human sex, love, and intimacy. The majority of human behaviors are influenced by *interactions* of biology, ecology, and culture; few human behaviors are shaped by biological or cultural factors alone.

How does the biocultural model help to explain Aka and Ngandu sex, intimacy, and love? Before applying the model, it is important to define a few terms. *Sex* in this chapter refers only to heterosexual intercourse, because, according to data obtained from our interviews, Aka and Ngandu do not have terms for, or practice, homosexuality, oral sex, or masturbation (although a few Ngandu said that homosexuality does exist but "only

in the capital city"). *Love* refers to strong emotional bonds or attachment to particular others. *Intimacy* refers to a close physical and emotional relationship (physical intimacy in a marital relationship generally includes sexual intercourse, whereas in a parent-child relationship it refers to regular physical proximity).

Sexual Desire and Frequency of Sex

Sexual desire is a human universal and an integral part of human nature in both males and females. It is part of our evolved psychology, an unconscious drive to reproduce, to spread our genes, and contribute to the survival of the species. But what motivates sexual desire? Many evolutionists say that pleasure motivates most animals to engage in sexual activity (Symons 1979; Turke 1988). Middle-class Euro-American cultural models of human sexuality are consistent with this "sex for pleasure" hypothesis as they emphasize the importance of experiencing and sharing sexual pleasure (see the human sexuality section of any major bookstore). The desire for children, or feelings about children, seldom motivate, or are linked to, sexual experiences. Euro-American cultural models of sexual activity also regard sex as play, a leisure-time, rather than work-time, activity (although sex as work might well describe the experiences of couples having difficulty conceiving a child) (Coates 1999; Francoeur 1999). While pleasure is clearly a motivating aspect of sexual desire, do Western cultural models influence evolutionists' hypotheses? How do peoples in small-scale cultures like the Aka and Ngandu view and explain their sexual behavior? If sexual desire is generated by recreational pleasure-seeking behavior, how often do most humans desire the pleasure of sexual intercourse?

Urban industrial studies measure the frequency of sex in terms of number of times per week or per month and assume that couples generally have sex only once per night or day. Most studies further show that younger (30–39) couples report having sex two to three times a week (T. Smith 1991). By comparison, our research has found that Aka and Ngandu couples have about three times as much sexual activity as do individuals in stratified cultures. Aka couples, for example, have sex three times per week, three times per night on average. Ngandu aged eighteen to fifty have sex approximately twice a week, two times per night on average. Laying to rest our initial suspicions of male bravado, both males and females in each ethnic group reported similar frequencies in separate interviews. This frequency of sex per night declined slightly by age, but age explained only 6 percent of the variability. A comparison of frequency of sex-by-age data for U.S., Aka, and Ngandu married couples shows that U.S. couples aged thirty to thirty-nine have sex 86 times per year, Ngandu 228 times per year, and Aka 439 times per year. The question then becomes why such a marked difference in the frequency of sexual intercourse exists between the U.S. and Central African couples.

Sex: Work or Pleasure?

Bila na bongedi (sexual desire is work). —*Aka man*

I am old and no longer have desire; when I was younger I liked it; when I was young I had pleasure. I had sex for kids and pleasure. I do not like sex now but if I refuse to sleep with him, I have to pay money to his family.
—Fifty-eight-year-old Ngandu woman, senior wife in polygynous marriage

Love is the work of the night; love and play are nice together if it makes a pregnancy. —*Young Aka woman*

Both Aka and Ngandu have terms for sexual desire (*bongide* among Aka, and *elebe* among Ngandu), and both men and women report experiencing feelings of desire in relatively equal frequencies, but among the Aka and Ngandu, sexual desire and expression appear to be substantially different from their expression in stratified nation-states. Aka and Ngandu believe that sexual desire, coupled with sexual activity, is the "work of the night," less arduous and more pleasurable than the "work of the day" but work nonetheless; as one Aka male succinctly put it, "The work of the penis is the work to find a child." Another Aka male and female shared similar views; the man said, "I am always looking for a child, it is pleasurable, but it is a big work," and the young woman noted, "It is fun to have sex, but it is to look for a child." Several informants compared the work of getting food to the work of searching for a child: "Getting food is more difficult, but both are lots of work. Sex life is not as tiring as work during day; the work at night is easier because you can make love, then sleep." Sex is the work of "searching for children." Both societies place a high value on children, in terms

of wanting many, and while neither is a "child-focused" society, children are highly desired, and adults spend much time and energy "looking" or "working" for children.

The Aka were the most emphatic on these points. One young Aka male explained, "I am now doing it five times a night to search for a child; if I do not do it five times, my wife will not be happy because she wants children quickly." One woman said, "I have sex with him to get infants, not for pleasure, and to show that I love him." Forty to 50 percent of the population of Aka and Ngandu is composed of children younger than fifteen. While the two cultures are not, as noted, child focused, children are in many ways the life of the village and camps. However, Aka men were the only people to mention that they wanted to have frequent sex and many children in order to build a camp. "My father is dead, and I need to make a big family. My first wife found my second wife, who was looking to have many children," one man told us. He was thirty-five, had two wives, and reported having sex three to four times a night with two days of rest in between. A twenty-five-year-old man said that "it is work to find children and get children to make a large camp like my father." He reported having sex four to five times a night. That is not to say, however, that sexual activity is directed only with procreation in mind. Sex is at times an expression of desire and of love. One postmenopausal Aka woman explained to us that she is still interested in sexual activity for *bongide,* or sexual desire, "not for children," and also because she "loves him."

Ngandu males and females expressed the same sentiment, that sex is "to search for children"; however, among the Ngandu, both males and females complained frequently of the tiredness that they felt during the work of the night: "Sex is a work, when I give sperm it is a work, I get tired after sex." One Ngandu man was particularly emphatic that "having sex three times a night is to look for a child, *not* for pleasure." More women of both Aka and Ngandu explained to us that, while sex was "work" and sometimes pleasurable, the "infant is the most important." A few women also expressed the idea that sexual activity was also a "sign of love."

Why do both Aka and Ngandu have such frequent sexual encounters per night, once their hard "work" of the night has paid off and they have "found" a child, that is, the wife has become pregnant? Our findings suggest that both Aka and Ngandu believe that frequent sex is linked to pregnancy and fetal development, as a Ngandu man explained: "Since my wife is just pregnant, I need to have sex more often, two-three times a night,

but then I take a three to four days' rest." The Aka emphasized the importance of male contributions to fetal development; 87 percent of informants said male sperm is essential to pregnancy and fetal development, whereas Ngandu informants said that both men and women contributed fluid to make a pregnancy and promote fetal growth. Individual variation exists among the Ngandu in the extent to which they think that the woman contributes to the development of the fetus. Some suggested that women also ejaculate "sperm" during orgasm, which aids in the physical development of the baby, but the Ngandu women said they did not have to climax each time during a night but that when women were excited or had an orgasm, they contributed substance. That is, the male sperm creates and "builds" the baby in utero, but it is possible for the woman to contribute also. Birth defects and/or miscarriages are the result of infrequent sexual (sperm) contributions by the father.

One Ngandu male also explained to us, "Both men and women have sperm or substances; that is the reason why SIDA [AIDS] is transmitted between a male and female; both combine to make a child," but he added that "both men and women contribute *malima;* if one spouse is sick, a pregnancy will not happen." The word *malima* is used to describe both male and female secretions during intercourse. While Ngandu hold various theories about how babies are created and "formed," they mostly agree that "women have *malima* as well as men, and it takes two sperms to create a baby . . . [I] do not know how the female gives, but I think it is necessary for a woman to reach climax sometimes, but not each time, to create a baby." Ngandu females expressed a similar view: "The *malima* of woman contributes to baby development, that is why it is necessary to continue with sex during pregnancy." Another Ngandu woman explained, "The two sperm join to create the baby, and the woman needs to be excited to give substances, but she does not need to climax each time to make the baby."

The Aka, as noted, hold a similar understanding, that it takes the "sperm" of both partners to create the new life; however, more Aka seemed to feel that the sperm of the father is primarily what creates the child: "Only men have *mamboli* [sperm] and make the baby; women say they cannot get pregnant without men, so it is men's sperm that makes the baby." Another Aka man told us that "women do not give much to the baby; it is men, especially at first, that give good development of the baby, [so sexual activity continues] twice every night until the baby is very big [about six months]; you then have to slow to once a night." It is the cumulative "sperm" throughout

the pregnancy that creates the child, not conception that occurs on one night; that is, a new life is conceived and "built" over repeated encounters throughout the duration of the pregnancy.

While sex is viewed as pleasurable, that pleasure is secondary or tertiary to working for, and "building," a child or to demonstrate love for a mate. Ngandu men and women were somewhat more likely than Aka to mention pleasure as an important part of sex life. Ngandu women often related that "sex is pleasure, work, a sign of love, and necessary for infant growth" and "sex is for pleasure and for work to find children." Thus Aka and Ngandu cultural models emphasize procreation and the "work" of sex. Sexual pleasure as somewhat of a postscript to the sexual experience is in marked contrast to contemporary middle-class Euro-American cultural models, which emphasize the recreational and pleasurable aspects of sexual intercourse.

The biocultural model is essential for understanding sexual desire and the frequency of sex. Both Aka and Ngandu have sexual desire, but their cultural models dramatically influence their motivation for sex and how often they express sexual desire in intimate relationships. These data demonstrate the complexity of the issue of sexual activity for "work," pleasure, love, or some combination of all. Our basic physiologic makeup may control sexual drive, but our emotions and cultural models certainly influence the expression of sexual desire and sexual activity, which may also be affected by particular ecological conditions, such as high child mortality rates and a diversity of infectious and parasitic diseases.

Love and Intimacy

> My first sexual experience was with my husband, I had just begun my periods, when we were together. I lived in a small hut, when he began to come and visit. When he and I were young, I chose to marry him because he caught a lot of meat and he was very handsome and nice. Once he brought a pig to my camp and gave me some, and after a time I wanted to marry him. He was strong and worked hard, and he became good in my heart. He shared a lot of his meat with other people. I loved him a lot and wanted children with no other. My mother taught me [that] if you marry him, [if] he is good and nice and brave, if he asks for sex, do not refuse him. I never refused my husband, and if I had *elebe* [desire], I waited for him and then asked for the sex. We made love for the infants and to show I loved him. When I was young, he said I was beautiful. We were always together, walking in the forest. He never hit me; other men hit their wives, but he never did. We lived together and worked together for many years, but he died. After he died, I had no relations with other men. I lived in a little hut and suffered a lot because I loved him so much in my heart. I wanted no other man. I lived alone with my children and I was still strong and young. They married and found others, and now I am alone. When I am alone at night, I think of him and cry, even now, after so long [she was seventy when interviewed].
>
> —Aka woman

If sexual activity is "work," the night's work of "searching for a child," does love, then, merely reflect procreative and parenting efforts? Is love simply a universal means of ensuring that couples bond, mate, reproduce, and care for their children? Love has been long thought to be a Western cultural notion that does not extend beyond Euro-American borders (Wright 1994), but attachment to, and love for, particular others is part of our phylogenetic history, evolved psychology, and human nature. Attachment is an essential component of survival and well-being in Old World monkeys, apes, and humans (Konner 2005). Offspring that are not attached to a specific adult may not survive, and offspring that are not securely attached (i.e., provided with consistent and appropriate responses) may suffer socially and emotionally later in life, which in turn influences their reproductive potential. As Bowlby (1972) suggests, attachment probably evolved in parent-infant relationships; infants attached to particular others were more likely to survive, which enhanced the reproductive success of both infant and the mother or other biologically related caregivers. But love in humans can be particularly strong, in part because of the additional evolved propensity in humans to be able to empathize with others—the ability to read the needs of others, to identify with and understand another's feelings or difficulties (Tomasello 1999). The attachment process and the ability to empathize and feel compassion for others influenced relatively (in comparison with other higher primates) strong dyadic or multiple bonds in humans. We all know how strong our feelings can be for others, even if they are not present, or when we have never met them (e.g., human responses to victims of natural disasters, wars, or epidemics).

While love and compassion are universal and part of our evolved psychology, how love and compassion are experienced in intimate relationships

varies dramatically. Both Aka and Ngandu identify love (*bondingo*) as an important component of marital relations. One Aka woman said, "I show I love my husband when we are together and I touch him and stay close to him." An Ngandu woman whose husband died several years previously told us: "Love is most important, and children will come later. I never looked outside of marriage for a lover; I do not desire other men because I want my husband—I have love in my heart for my husband. He was nice and respectful to me."

An Ngandu man also expressed his love for his wife, who could not have children: "I love my first wife the most, she is closest to my heart. She helps me and gives me food and respects me. We did not have children together; she was not able to. Now she does not menstruate, and we no longer have sex. I have sex with my second wife, to take care of the desire, but it is the first wife I love the most."

Both Aka and Ngandu men and women expressed love as part of their intimate relationship with their spouse, but how they experienced and demonstrated love varied substantially. Many middle-class Euro-Americans would describe Ngandu husband-wife relations as distant and perfunctory and Aka husband-wife relations as intimate, close, and giving. Ngandu husband and wife do not eat together, do not always sleep in the same bed, and share few activities, Ngandu men contribute little to subsistence or child care. By comparison, Aka husband and wife spend considerable time together during the day in a variety of subsistence tasks, including the net hunt; they eat together and sleep in the same bed (but not necessarily next to each other). As we mentioned earlier, husband and wife contribute relatively equally to subsistence, and Aka fathers provide regular child care. Husbands and wives in both groups do not publicly demonstrate affection, such as hand holding, hugging, or kissing. How is love expressed and measured? Both Aka and Ngandu mentioned having sex on a regular basis as a sign of love, but for Aka men and women, working hard and physical proximity were key measures of spousal love. Ngandu women occasionally mentioned that gifts of cloth or jewelry from their husband were signs of love. Ngandu men felt that their spouse's love was demonstrated by her respect for his demands and authority within the household and by such tasks as serving him a meal, washing his clothes, and giving him money. In addition, for the Aka and Ngandu, to speak of love is to speak of desire, and part of that desire is a desire for children. The biocultural model is useful for understanding the experiences of the Aka and Ngandu. Attachment

ability, to be empathetic to the needs of others, to "read" their minds, is a part of our evolved psychology. At the same time Aka and Ngandu foundational schema regarding gender hierarchy and their different culturally constructed niches (e.g., sedentary versus mobile lifestyles) contribute to the diverse ways in which the two cultures experience and express love, desire, and sexuality.

Anger and Divorce

If I do not give him food or wash his clothes, he hits me. —*Ngandu woman*

I hit my wives when they do not obey or listen to my requests. —*Ngandu man*

When he took another wife I hit him, but when she and I worked together, then it was OK. —*Aka woman*

Conflicts arise in marital relationships and at times result in anger and physical violence. In preliminary discussions with Aka about marital relationships, several informants mentioned slapping or hitting their spouse. Our impression was that domestic aggression was rare among the Aka, and we had observed only occasional acts of a wife's yelling or slapping a husband. Ngandu spousal violence appeared to be frequent. A Ngandu woman showed up for an interview with a swollen eye and missing tooth after an argument with her spouse. Also, three Ngandu women arrived and wanted to speak of "brutal sex," essentially what turned out to be marital rape. We decided to ask informants about physical violence in their relationships.

Aka rarely hit their spouse (few times, if ever, during their relationship), but when it does occur, women were slightly more likely to initiate the hitting (9 of 17 incidents reported by men and 7 of 10 incidents reported by women). As one Aka woman explained, "I hit him when he forgot how many days he had been with the other wife." Two Aka men detailed their experiences with their angry wife: "My wife is very brave; she hits me, but I do not hit her. She hits me because I was walking in the forest and visiting other camps, and she thinks it is to find another woman," one man said, and the other man reported, "I hit my wife because she found another man, so she took a log and hit me. We are divorced." A characteristic feature of Aka hitting is that if a husband hits his wife, she is likely to hit him back. The

reasons Aka husbands or wives gave for hitting their spouse were similar: the husband or wife was "walking about" (*tambula*) too long, that is, being away too long and potentially looking for and finding another partner. A few Aka women mentioned that they hit their husband when he simply proposed the idea a second wife. One older Aka man summed up his experiences with spousal violence: "I hit her because I was jealous and I was afraid I would lose her love. She hit me also when I was walking too long."

Hitting in response to the fear of loosing a mate was a common theme among the Aka. A young Aka woman expressed her concerns about her new husband's walking around: "If he finds another woman, I will hit him, and if I know the woman, I will beat her, too. I am afraid if he leaves me and the baby for another woman. I am afraid he will abandon us." Another Aka man said that his wife attacked him twice because he forgot the number of days he had slept with his other wife.

In contrast, the Ngandu women were less likely to initiate violence toward their spouse as a result of jealousy or fear of abandonment. Spousal violence among the Ngandu is regular, (i.e., several times a year), generally initiated by men, and seldom involves a wife's hitting her husband in response to his attack. The most common reason given by our male Ngandu informants was that their wife did not respect or follow their requests. She did not wash his clothes, give him food, or, as one man complained, "When I asked for something to eat, she ignored me and eventually I hit her." Invariably, their stated reasons for violence had to do with their wife's lack of obedience and respect: "I hit my wives when they do not obey or listen to my requests." As several men reported, "I hit only when she does not respect my requests"; "Only twice when I asked her to wash my clothes or give me food and she refused. She stopped giving me food for four days." Another common reason given was for refusal not only of household service but of sex: "I only hit her when she refuses sex with me." Indeed, members of one particular group of Ngandu women shared that each feared her husband because of what the women termed "brutal sex." One woman related this incident: "I am afraid of him when he comes home from being away. He always wants sex, and he forces me. It is brutal sex and afterward I am hurt and bleeding. I cry because I hurt so badly. If I refuse, he beats me. For women here life is very difficult, we work hard during the day, and at night with our husbands the sex is brutal, and we cry and bleed."

One Ngandu man explained that he became angry at what he saw as negligent maternal care: "My wife went outside, left oil in pot on the fire in house, and my daughter went to the pot and burned her hands. I was angry that she neglected to watch the child better and hit her." A small number of Ngandu men reported that sometimes their wife would hit them when the men were giving more things to a cowife (e.g., money, clothes) or if a wife caught a husband with another woman. In one case the wife stopped giving her husband food for three or four days to make sure the new relationship stopped.

Ngandu women said their husbands also resorted to physical violence if they thought a wife was looking to have a sexual affair with another man (putting on nice clothes, staying away at another village for a long time) or when a wife did not show public respect to her husband—one woman was hit when she spoke at church without his permission.

Aka and Ngandu patterns of anger and violence illustrate influences of both biology (evolutionary psychology) and culture (evolutionary cultural anthropology). The violence seen among Aka men and women and among Ngandu women, and their explanations for hitting—their spouse was sleeping or developing a relationship with somebody else—are grounded in the evolved propensity for sexual jealousy. Violence is a response to the loss or perceived loss of a loved one and the resources the loved one provided. It is also potentially a mate-retention strategy. The influence of culture is evident in the explanations given by Ngandu men and women for violence—that is, the lack of respect and deference shown for the male head of the household.

Divorce

Men do not understand the sense of marriage. It is very dangerous to take other wives. I will leave and find another. It does not work; many wives divorce because of it. It is very mean to take another wife. Men depend upon their women for their life, for clothes, and food and to take care of their children.
—Ngandu woman

My first husband found another wife, and I was mad and jealous and fought with him and said this is not possible, so I divorced him. *—Aka woman*

We also asked Aka and Ngandu about their marital history and found that divorce is a common feature of married life. The most common cause for

divorce in both groups was the spouse's sleeping with, searching for, or finding another mate (56 percent of all divorces) but was a more frequent reason among the Aka (64 percent versus 38 percent among Ngandu). As one Aka man related, "I divorced my first wife, because she slept with others, and it hurt my heart because I loved her so much." An Aka woman explained, "My husband found another wife, and I was mad and said it is not possible, now we are finished, and I refused him and we divorced."

Ngandu men were more likely to divorce their wife because she did not respect him or "did not listen to me." Ngandu women, but no Aka women, mentioned that their husband left because they did not have any children. One Aka man said two of his wives left him because they did not get pregnant and they were having sex five times a night. The reasons for divorce and who initiated the divorce were quite varied.

A major difference between the two groups was which spouse left the marriage. Fifty-eight percent of Aka men said their wife left them, and 67 percent of Aka women said they left their husband. By contrast, 71 percent of Ngandu men said they left their wife, and 83 percent of women said their husband left them. Again, the biocultural model is useful for interpreting the cross-cultural variability. The most common cause in both groups, infidelity, is of course consistent with an evolved psychology. Men risk losing the certainty of paternity, whereas women risk losing access to resources or protection from other males. Love, attachment, and the betrayed feelings that so often accompany unfaithfulness are a part of our evolved psychology. Ngandu gender hierarchy and Aka egalitarianism also influenced the patterns of divorce, as Ngandu men were likely to cite lack of respect as a cause of divorce, and generally Ngandu men left their wives. Among the Aka the reasons for divorce were varied, and men were not the primary initiators of divorce.

Other Intimate Relationships

Thus far we have focused on Aka and Ngandu marital relationships because our original study focused on understanding sexual behavior, but we want to briefly mention the nature of same-sex and parent-child relationships because they illustrate the diversity of intimacies within cultures and provide more clues about the nature of intimate human relations. Intimate same-sex relationships are common to both Aka and Ngandu. They are

not sexual relationships and are never described as homosexual relationships, but they are intimate relationships in that the individuals are both physically and emotionally close. They may sleep together, spend much of the day together, and, unlike marriage relationships, show public affection toward each other, such as holding hands. These intimate relationships are particularly common in adolescence but can occur in late childhood or adulthood. Relationships such as these are common with adult men in both groups but are rare with adult women. For instance, it is not unusual to see two adult Ngandu males walking down the street holding hands. Individuals are also emotionally close and talk about special emotional bonds. We suggest that infatuation and idealization (key features of romantic love) also occur in these relationships, as individuals are excited about being together, seek each other out, and are emotionally intimate.

Parent-child relationships are also intimate, especially among the Aka. In both groups all children younger than seven, and even older adolescents, sleep with their mothers and other adults. Aka infants are held or are within arm's reach of an adult during all daylight hours, and children and adolescents spend a good portion of every day with their parents. After age two or three, Ngandu children are placed under the care of older children in the village while their mothers go work in the fields. Aka children tend to have equally strong feelings and love for both mother and father, while Ngandu children tend to have especially strong emotional feelings toward their mothers.

Discussion

A Biosocial Evolutionary Framework for Understanding Sex, Love, and Violence

In an effort to explain universal as well as particularistic results of this study, we consider psychological, ecological, and cultural interactions that shape behavior. Three cultural-ecological factors are important for understanding the particularistic themes: the nature of patrilineal descent and social organization, the nature of social relations, and the political-economic setting.

Strong patriclan social organization among the Ngandu provides a mechanism for defending and protecting material (e.g., land and crops)

and reproductive (e.g., spousal) resources. Consequently, the number, age, and sex of geographically close kin, especially males, are important (e.g., male-male alliances). The Ngandu accumulate goods and property (e.g., planted crops) that must be guarded from mobile Aka and other farmers. In addition, more wives (and children) mean not only prestige and status but increased wealth. Wives are essentially the breadwinners: they work in the fields, herd livestock, and sell produce from their farms in the market. They bring more wealth and food not only to their own nuclear family but to the larger extended family as well. Therefore intra- and intergroup hostilities about women are not uncommon, polygyny is practiced by about 40 percent (Hewlett 1991), and many men do not have spouses, which leads to conflict and violence. Gender inequality is strongly conserved, and violence against women within this setting is frequent. By comparison, Aka are mobile, and intra- and intergroup hostilities are infrequent, so clan organization is weak. Strong patriclan organization among the Ngandu leads to dependency upon strong alliances, a greater number of clan members, and a culturally transmitted ideology of male deference, obedience, and respect, as male clan members are important for resource defense. Aka, on the other hand, are dependent on both men and women from both sides of the family, because it is important for them to be flexible in response to the availability of wild food resources. For the Aka the number, age, and sex of geographically close biological kin, specifically, male kin, is of less importance, because they have little need for resource defense (accumulated goods, property holdings) and male-male alliances. Therefore the Aka promote and culturally conserve gender and age egalitarianism, not deference to either elders or men. Violence, particularly violence against women, is not common.

The Aka have "immediate return" values and social organization (Woodburn 1982:205). This means that their activities are oriented directly to the present, and they labor to obtain food and other resources consumed or used that day or immediately thereafter. They have minimal investment in accumulating, in long-term debts or obligations, or in binding commitments to specific kin. Therefore the nature of violence has to do with protecting the commitment between spouses, not with protecting accumulated resources, spouses, and an ideology of male deference and authority built around clan obligation and alliances needed for that protection.

The nature of culture and social reproduction is important in understanding the diversity of responses within the marital bond. We emphasize

the importance of understanding such factors as the conservative nature of patrilineal clan ideology and the material basis of social relations (i.e., Ngandu men often show their love for their children and wives by giving them gifts). Many aspects of culture are transmitted though conservative transmission mechanisms (e.g., vertical and group effect mechanisms), and some aspects of conservative transmission may not be linked to adaptation. The social transmission of patrilineal ideology among the Ngandu seems to be an adaptive aspect of culture. Ngandu children acquire this strong patrilineal ideology not through trial and error but through mechanisms that enable the rapid acquisition of culture. This strong ideology emphasizes deference and respect for elders, males, and ancestors. For the Ngandu social relations have to do with maintaining a gendered hierarchy of commitment and obligation, respect, and obedience. Disregard for this established hierarchy signals a potential threat, as it can lead to social disruption and reorganization. Therefore male deference, commitment, and respect for authority figures must be maintained. Intergenerational transmission of property and social status is crucial, because the interests of the group are dependent upon maintaining the interests of the clan, that is, male-male alliances. Economic activity, social continuity, delayed production and consumption, long-term planning, and concern are bound by the patrilineal lineages, social commitments, and the importance of remembering those to whom you must show deference and obedience, the group to which you are bound and committed.

A third cultural difference between the two groups is the material versus emotional basis of social relations. Several scholars have written about the material basis of social relations in Bantu-speaking central Africans (Levine 1977; Giovanna and Palloni 2006). Social relations cannot continue without a material exchange. For the Ngandu the love for and commitment to a loved one not only is tied to the maintenance of formal hierarchy and obligation but is expressed through gift giving (male to female as noted earlier) and to the "service" of female to male. For the Aka their love seems to be bound more directly to their relationship, which was not expressed as a provisioning one.

Diversity exists in the experiences and expression of love, sex, and violence, but, as we have noted, there are also several commonalities. Evolutionary psychologists are interested in identifying genetic or biologically based universals that evolved during the environments of evolutionary adaptation (i.e., long periods of human hunting and gathering) in response

to recurrent adaptive problems. One recurrent problem faced by humans was the ability to not simply enter into a bond with another but to maintain that union. Earlier we listed several common patterns found in the data from the study of Aka and Ngandu (frequency of sex, love as a part of the marital bond, jealousy or divorce in response to a straying partner). Given the adaptive problem of responding to natural selection's pull to form sexual alliances, which are jeopardized by the seemingly naturally conflicting sexual strategies of men and women, one could hypothesize that psychology would evolve to deal with this discordance. The response of jealousy and anger to the potential loss of a loved one and the resources he or she provides, and the cross-cultural commonalities of the Ngandu and Aka, suggest that jealousy and violence as a mate-retention strategy are the flip side of the attachment or proximity module developed in the environment(s) of evolutionary adaptation as described by Bowlby (1972). In much the same way perhaps the expressions of anger and conflict represent an evolved psychology for communicating distress at the loss or potential loss of an individual who enhanced survival (and the resources she or he provided).

Aka and Ngandu patterns of anger and violence illustrate influences of both biology (the evolutionary psychology perspective) and culture (the evolutionary cultural anthropology perspective). The violence reported by Aka men and women and Ngandu women, and their explanations for hitting—that their spouse was sleeping or developing a relationship with somebody else—are grounded in the evolved propensity for sexual jealousy. As we noted earlier, jealousy is part of our evolutionary programming. Sexual desire and passion breed wariness: early in human history men who did not react jealously had mates who "walked too long" and were impregnated by other men, thereby passing on someone else's genes to future generations. On the other hand, women who did not react to a spouse's straying were left to raise their offspring without help. Evolutionary psychology focuses on how we are pulled into sexual unions of love and marriage that are then jeopardized by the conflicting sexual strategies of men and women: men to make the most of their abundance of genetic seed and women to satisfy their desire to partner up with the genetically favored man best able to invest in the care of her offspring. Jealousy is also a response to the threat and conflict of the differing reproductive interests of men and women (Konner 1983). Therefore violence is not only a response to the loss or perceived loss of a loved one and resources but also a mate-

retention strategy. The influence of culture is also evident in the explanations of Ngandu men and women for violence—that is, the lack of respect and deference shown to the male head of the household.

In addition, both Aka and Ngandu couples expressed the importance of intimacy and love within the marital bond. The combination of genetic and cultural evolution—wherein selection favored a species-specific type of intelligence and expressed empathy (and certainly other variables)—are what makes us human. This articulated empathy, the ability to feel and understand what others are experiencing and expressing, and through these qualities the ability to understand the needs of others—to respond to them, for example, by daily sharing, by a compassionate response to need—makes us different in distinct ways from our ape relatives. The compassion of our ancestors from our evolutionary past, who took care of each other and felt empathy for others, was the source of our emotionally charged behaviors of adaptation necessary for survival—love, intimacy, desire, and jealousy (Hrdy 1999:392).

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In looking at models of sex and marriage, Quinn (1996) suggests that the cultural ideal of a Euro-American marriage is that it should be fulfilling, and each partner must make an effort to figure out the other's needs in order to fulfill them and must sacrifice his or her own needs in order to do so. Both partners have to work at creating and maintaining a successful marriage—this is their cultural task solution. This may be in part because generally there are no close kin or clan to help fulfill this task of encouraging the couple to work it out. Nuclear families are often not living near their extended network of kin. Couples are dependent upon each other; their relationship is primary, because they are without the alliances and close help of a large extended family. Shweder's study (2003) of cosleeping among the U.S. middle class highlights the "sacred" husband-wife relationship because, unlike spouses in other cultures, parents always sleep together in the same bed, regardless of the number of rooms in a house. Aka and Ngandu husband-wife relations differ in that the "cultural niche" they have built within a similar ecological setting differs dramatically and has a profound impact on their "models of marriage." The Ngandu live in compounds of clans, and neighbors are close by and undoubtedly related. Each home, however, is separate and private. Wives within a polygynous

household have their own rooms (at the very least), although they more often inhabit separate (but joined) homes. The Aka live in such proximity to their nuclear family and extended kin that their life is lived in public and open to censorship. Husband and wife are emotionally intimate, but they are not dependent on each other for social-emotional support, as is often the case in the United States. Individual autonomy is highly valued and encouraged, even within the marital bond, and this culture is conserved. As our data demonstrate, the Aka have other cultural models of marriage and ways of fulfilling marital task solutions. Topics of intimacy, sexual desire, jealousy, and anger are complicated and need stronger attention than what they have been accorded by scholars.

In addition, we have an evolved universal human psychology, but we have to be careful of developing interpretations of human nature based upon limited or biased data (e.g., Western notions of sexuality and ideal husband-wife relations). Human sex, love, and intimacy can only be understood as interactions of evolutionary psychology (biology), evolutionary ecology (ecology), and evolutionary cultural anthropology (culture). Human biology (genes) and culture have their own properties and need to be examined in detail, but they also interact in ways that pattern human behaviors. An integrated evolutionary model is a heuristic tool for thinking about these interactions and can help to generate testable hypotheses.

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