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Chapter 3

Intimate living: sharing space among Aka and other hunter-gatherers

Barry S. Hewlett, Jean Hudson, Adam H. Boyette & Hillary N. Fouts

Mobile hunter-gatherers (or foragers) are known for their extensive sharing of game meat (Gurven 2004), childcare (Hrdy 2011), and to some extent knowledge (Hewlett et al. 2011) but no study that we are aware of has examined how foragers share space across a range of domains. Bird-David (1990) suggests that foragers share food with many others, do not store food, and stop when they have enough food each day because they live in a 'giving environment'; i.e. they trust that under normal conditions the natural environment will provide them with resources just as they trust that others in the settlement will share with them every day. This chapter explores whether or not the giving environment extends to sharing space with others. Are foragers generous with their living spaces? How much space do individuals use in a settlement, house or bed? Individuals in many Euro-American cultures have their limits in how much space they will share in their home, beds, or interpersonal interactions. They may need a certain amount of space in a bed to feel comfortable or a certain amount of space in a house so they do not feel crowded. Euro-Americans, like peoples in all parts of the world, have cultural preferences and feelings about how much space one can share with others.

The primary aim of the chapter is to explore what we know about the space foragers share in four domains: settlements, houses, beds, and interpersonal interactions. Do hunter-gatherers share space any differently from food producers (e.g. farmers or pastoralists)? Does sharing space vary by domain? What explanations do anthropologists use to explain spatial patterns in foragers? The secondary aim of the chapter is to consider the possible impacts of sharing space. What, if any, are the relationships between sharing space and sharing food or other forms of sharing? Do feedback mechanisms or loops exist? What are some of the hypothetical biological, psychological, or cultural consequences of sharing space? Most anthropologists would acknowledge that the four domains of shared space are influenced by individuals and culture (e.g. learned spatial preferences, knowledge about the size or where to build a house), but few consider how the constructed environments impact individuals (e.g. their biology or psychology) and culture (e.g. maintain, constrain, or modify cultural beliefs and practices).

All of us have conducted research with the Aka hunter-gatherers of the Central African Republic so each spatial domain usually starts with a detailed description of Aka patterns and how they compare to those among the Ngandu, their farming neighbours (see Lewis, this volume, for an overview of Pygmy and non-Pygmy groups in the Congo Basin). Our experiences with Aka likely filter and bias our generalizations about other foragers. From there, we describe patterns in other hunter-gatherer groups that have comparable data and then move to comparisons of spatial patterns with food producers to see if any differences exist between foragers and food producers. When data exist, we also describe comparable data from developed countries.

Since data from the Aka permeate the chapter, we provide a brief introduction to their culture and views towards interpersonal space.

The Aka are one of about 15 ethnolinguistic groups of Congo Basin hunter-gatherers (Hewlett 2014). About 40,000 Aka live in northern Republic of the Congo and southern Central African Republic and about 2000 live in and around the study area. The Aka live in mobile groups of 25–35 people and rely upon a wide variety of hunting and gathering techniques for day-to-day subsistence. The Aka have multidimensional social-economic relationships with Ngandu and other farming ethnic groups. As with several forager groups, three related foundational schema (i.e. relatively concise concepts and values that pattern thinking and feeling and pervade many

domains of life) are: an egalitarian ethos, respect for the autonomy of each individual, and extensive sharing. An egalitarianism ethos devalues hierarchical ranking, including political, age, or gender ranking. Men and women of all ages are viewed as relatively equal and have similar access to resources. Respect for individual autonomy in the context of the community is also a core value that permeates many dimensions of Aka life. One does not coerce or tell others what to do, including children. Finally, giving or sharing is also a pervasive way of thinking in Aka life; they share 50–80 per cent of foods acquired, they share it with most everyone in camp, and they share it every day (Kitanishi 1998). Sharing of childcare is also extensive; infants have up to 20 different caregivers (Meehan 2004), fathers provide more direct care to infants than infants in any other culture (Hewlett 1991), and 90 per cent of Aka mothers report that other women nurse their young babies (Hewlett et al. 2011). In this chapter, we extend the sharing foundational schema to the domain of space.

Sharing is a foundational schema among the Aka and several other foraging groups. Within the foundational schema of sharing, several more detailed and specific cultural models exist. Cultural models are implicit ideas about how the world works and guides behaviour and interactions (Holland & Quinn 1987; Boyette & Lew-Levy, this volume). For instance, hunter-gatherer groups usually have cultural models about how particular game animals should be divided. In the U.S., cultural models exist about where husband and wife should sleep; the married couple is 'sacred' and husband and wife seldom sleep in different rooms regardless of the size of the home. This is not the cultural model in India and other cultures (Shweder 2003).

A cultural model important for understanding Aka spatial patterns is the belief and desire to stay physically close to others. When Aka adults were asked to list the characteristics of a good mother or father, staying physically close to the child was frequently mentioned as a desirable quality for both fathers and mothers (Hewlett 1991). One Aka father said 'We Aka look after our children with love from the moment they are born to when they are much older. The villagers love their children only when they are babies, but when they are big they are beaten badly. With us, even when the child is big we cuddle them and keep them close.' Staying close is also highly valued in husband-wife relations. In a study of Aka husband-wife relations (Hewlett & Hewlett 2008) both husbands and wives expressed sentiments similar to this Aka woman: 'I show I love my husband when we are together and I touch him and stay close to him.' Children also want to stay close to others. An observational study by Fouts & Lamb (2009) examined conflicts between toddlers and older juveniles and found that 38 per cent of the hunter-gatherer conflicts were over toddlers desire to stay close to juveniles whereas only 2 per cent of conflicts among the neighbouring farming children were about staying close. Juvenile-toddler conflicts among the farmers were much more likely to be about competition over objects and juveniles hitting the toddlers, both of which were rare in the hunter-gatherer children.

The Ngandu neighbours of the Aka live in sedentary villages of 50–200 individuals and have fields of manioc, corn, plantains and peanuts. They exchange some of their domesticated crops for meat and other forest products of Aka hunter-gatherers. Foundational schema among the Ngandu farmers are distinct from those of the Aka and include: gender and age hierarchy and communalism. Women should defer to the requests of men and the young should show deference, be respectful, and listen to anyone older than them, be they older brothers and sisters or parents. The farmers are patrilocal and patrilineal and have strong clan organization. Communalism refers to a cultural value placed on putting the needs of the group, generally clan members or the extended family, over the needs of an individual (Hewlett 1991).

Density of households: Sharing space in settlements

Archaeologists have systematically examined spatial patterns (called site formation) of hunter-gatherer settlements for a long time (Binford 1980, 2001; Kroll & Price 1991; Gamble & Boismier 1991; Kent 1993a) and here we focus on studies that examine the density and compactness of settlements of living hunter-gatherers. Ethnographers working with mobile hunter-gatherers have noted that the population densities of forager subsistence areas are low but that the densities of their living environments are remarkably high (Konner 1976; Draper 1973; Hewlett et al. 2010). Archaeologists utilize at least two ways to quantitatively describe the compactness of a settlement: 1) the average amount of space each individual has in a settlement or 2) the average distance to the nearest neighbouring household. The nearest neighbour calculation can be measured from household hearths or the centre or front of houses. Table 3.1 summarizes results of systematic studies on the size of settlements and the average amount of space each individual has in a settlement. Table 3.2 lists the average nearest neighbour distances for groups we were able to find data. The tables indicate that, with the exception of the Australian groups,

Table 3.1. *Measures of settlement density in five forager groups.*

	Aka	Efe	Hadza	!Kunga	!Kungb	Ngatatjara
Mean size of settlement	262 sq. m (2820 sq. ft)	242 sq. m (2604 sq. ft)	796 sq. m (8565 sq. ft	358 sq. m (3853 sq. ft)	477 sq. m (5134 sq. ft)	39809 sq. m (428501 sq. ft)
Mean number of inhabitants	22.0	18.9	41.5	17.4	27.3	32.7
Mean area per person in settlement	11.5 sq. m (123.8 sq. ft)	12.5 sq. m (134.5 sq. ft)	19.2 sq. m (206.6 sq. ft)	20.6 sq. m (221.7 sq. ft)	17.5 sq. m (188.0 sq. ft)	1219 sq. m (13121.2 sq. ft)
Source	Hudson, this chapter	Fisher & Strickland 1991	O'Connell et al. 1991	Gould & Yellen 1987	Draper 1973	Gould & Yellen 1987

forager settlements are relatively small and dense. The size of some forager settlements, such as those of the Aka and Efe, are about the size of an average house in the U.S. or Australia (see Table 3.5). The average amount of space per individual in the settlement is about 10–20 sq. m (100–200 sq. ft).

In terms of average nearest neighbour, considerable variability exists, but, in general, neighbours are close. Several ethnographers and ethnoarchaeologists have noted that forager houses are so close to each other that people can hand items back and forth without getting up (Draper 1973; Fisher & Stickland 1989). Fisher & Strickland (1989) indicate that only 4 per cent of houses are more than 10 m away from another house. Average nearest neighbour data are limited in farming and pastoral cultures, but with the exception of the Australians, nearest neighbours in these cultures are almost twice the distance than those of the foragers. Among the farming Tswana average nearest neighbours are 17.7 m apart while among the pastoral Herero they are 20.8 m apart (Gould & Yellen 1987).

Table 3.2. *Average nearest neighbour in forager groups with data.*

Ethnic group	Average nearest neighbour house	Reference
Ache (forest context)	2–3.5 m (6.6–11.5 ft)	Hill 1994, O'Connell 1987
Ache (reservation context)	100 m	Gurven et al. 2002
Aka	4.3 m (13.8 ft)	Hudson, this chapter
Efe	4.8 m (15.7 ft)	Fisher & Strickland 1991
!Kung	7.8 m (25.6 ft)	Gould & Yellen 1987
Hadza	5.9 m (19.4 ft)	O'Connell et al. 1991
Mikea	>10 m (>32 ft)	Kelly, Pover & Tucker 2005
Alywarre	25–35 m (82.0–114.8 ft)	O'Connell 1987
Ngatatjara	36.7 m (120.4 ft)	Gould & Yellen 1987

Ethnoarchaeologists identify two possible reasons for the large Australian settlements. Gould & Yellen (1987) hypothesize that Australians do not have wild animal predators that threaten settlements as do the African groups such as the !Kung, while O'Connell (1987) suggests that Alywarre households are far apart because they receive rations from the government that are not shared with others. The predator hypothesis suggests that forager settlements are compact to keep more eyes on predator threats. A heated debate occurred between Binford (1991) and Gould & Yellen (1991) about the predator hypothesis. Binford indicates that several Australian groups (Yintjingga and Ingura), Andaman Islanders, Punam, and some South American groups (Alacaluf and Yahgan) have compact settlements similar to the !Kung but that they do not have any wild animal predators. He indicates that some Australian groups live far apart because they rely more heavily on gathering and do not have large game hunting and therefore have fewer cooperative subsistence activities and less of a need to live close together. Gould & Yellen counter his critique by pointing out that the Australian groups he mentions as living in compact settlements do have a dangerous predator, the estuarine crocodile, and that Binford only provides photos and anecdotal evidence for the other groups. What may be of interest for this chapter is that the debate identifi (mostly from ethnographer's photos) at least 10 other forager groups from all parts of the world with compact sett (Binford 1991) and that the hearth to hearth calculations for the Ngatatjara were taken from clumped windbreaks that shared a hearth (Gould & Yellen 1991) indicating that some segments of the settlements were densely organized.

Archaeologists Whitelaw (1991) and Binford (1978, 1991) have been particularly interested in trying to understand the diversity in the density of forager settlements. Whitelaw examined 112 cultures and 800 settlement plans and identified several factors that were associated with forager sett density. Sett - ments are denser when: the settlement size is small, the

group is more 'traditional' (versus acculturated), the settlement is occupied for a short period of time, and the group lives in the tropical forest (versus savannah groups). Several of his factors help to explain variability in Table 3.2; Ache, Aka and Efe live in the tropical forest, have smaller settlements, are traditional (in forest context for Ache), and frequently move. Whitelaw indicates that animal and plant resources are more dispersed and medium sized game meat a regular part of the diet in tropical forest environments than they are in savannah environments where they rely more on gathered foods. Forest environments encourage more cooperation (sharing food and subsistence activities) and households are therefore closely spaced. Although the !Kung live in a savannah environment, Gould & Yellen (1987) also find that the frequency of food sharing explains compactness of !Kung settlements. In general, archaeologists indicate that 'In situations encouraging cooperation, the residences of cooperating individuals are likely to be closely spaced, facilitating communication and interaction, as well as allowing monitoring of what others do and do not have is also important in maintaining close relations to be seen to be cooperating fully' (Whitelaw 1991, 168).

Binford (1991b) indicates that cooperation influences the density of settlements, but he emphasizes variability by season within a forager group and shows that camp density is greatest during the season when cooperative hunting takes place; i.e. the density of camps is associated with organizing labour in the group. Binford also emphasizes the importance of cooperative subsistence activities to explain the dense settlement spacing in the predator debate mentioned above.

Like Whitelaw above, several scholars (O'Connell 1987; Fisher & Strickland 1991) have proposed a link between settlement density to the frequency of food sharing. Issues exist with this explanation because the Ache share extensively in both the forest and reservation contexts (Gurven et al. 2002) but nearest neighbours in the reservation setting are 20 times the distance than in the forest setting, Ngatatjara share meat but nearest neighbours are far away, and Mikea nearest neighbours are at intermediate distances, but they rarely share food outside of the household (Tucker 2004, and in this volume). While nearest neighbour densities are problematic for explaining Ache sharing, Gurven et al. (2002) find that regardless of forest or reservation setting proximity is an important predicator of sharing; they are more likely to share with those physically close to them. The Mikea data are also consistent with the idea that distance between households matters when it comes to sharing food; Mikea do not share very much food and their households are far apart from each other, arranged in a linear north–south pattern and are often separated by heavy brush which together limit visibility into other households (Kelly et al. 2005).

Pronounced cross-cultural diversity in forager settlement densities exists and archaeologists provide several useful studies to explain that diversity. One of the most common explanations for the diversity is variation in food sharing or sharing in subsistence activities. While extensive diversity occurs in forager settlement spatial density, a general trend also exists. Forager settlements are generally smaller and more compact than settlements in other modes of production. It is also reasonable to propose that intimate living is at least in part associated with extensive sharing of resources and cooperative subsistence activities commonly associated with forager life.

Sharing space in a home

Both archaeologists and social-cultural anthropologists have been interested in household space. Narroll (1962) conducted an early study of household space in 18 non-industrial cultures and identifi a modal number for the spatial area used per person: 10 sq. m. This was an important study because archaeologists could use the standard number to estimate the population of sett Several archaeologists critiqued this work with case studies (LeBlanc 1971; Wiessner 1974). Brown (1987) found several inaccuracies with the original study and conducted a more extensive 36 culture study from the Human Relations Area Files (HRAF) Probability Sample and found that the average household space per person was 6 sq. m. Wiessner (1974) pointed out that the study did not fi mobile hunter-gatherer patt and Porčić (2012) demonstrated that the 6 sq. m applied only to agricultural cultures, but not mobile cultures (see Steadman 2016 for a complete review of this topic).

Social-cultural anthropologists have used household dwelling size to predict other features of culture, such as whether a culture is patrilocal versus matrilocal (matrilocal households are larger; Divale 1977; Ember 2017), and to address hypotheses from psychologists that humans have needs for particular amounts of space in a home. If they do not have enough space and homes are crowded, they hypothetically develop social-psychological pathologies, such as being more aggressive, using harsher means to discipline children, being more likely to be depressed and having children that have social-behavioural diffi in school (Brown 1987; Blake 2007).

Wiessner (1974) described why the cross-cultural studies of dwelling space do not fi foragers, but she did not provide cross-cultural data on forager household

Table 3.3. *Average size and space per person in Aka and Efe homes.*

	Aka	Efe
Average size of house	4.8 sq. m (51.7 sq. ft)	5.1 sq. m (54.9 sq. ft)
Average number of rooms in a house	1.0	1.0
Average number of beds in a house	1.7	nd
Average number of people per room	3.1	3.2
Average space per person in a house	1.5 sq. m (16.1 sq. ft)	1.6 sq. m (17.2 sq. ft)
Source	Hudson, this chapter	Fisher & Strickland 1989

space. Table 3.3 provides data on the average house size and average space per person among the Aka and Efe foragers of the Congo Basin. Data are based on measuring 30 homes among the Aka and 115 homes among the Efe. The Aka and Efe live about 1700 km (1056 miles) from each other, but their homes and average space per person are remarkably similar. The household space per person for both are substantially lower than the cross-cultural standard of 6 sq. m. Fisher & Strickland (1989) also found that the correlation between house size and number of people in a house correlated weakly and that it only explained 6 per cent of the variance. Mikea forager household space is somewhat larger (5.6 sq. m; Kelley et al. 2005) than the Aka and Efe houses, but the average number of inhabitants per house is not reported so it is not possible to calculate household space per individual.

A few ethnoarchaeologists have provided precise data on dwelling fl space, but some measures of household space also exist in ethnographies in the HRAF studies mentioned above. Table 3.4 provides dwelling size and space per person from Brown's (1987) HRAF study. His used measures from the largest typical house in a culture. So, if a group used communal houses in one season and family houses in another season he would use the larger communal house size to calculate dwelling fl size and average space per person. His original study did not analyse data by subsistence type so Table 3.4 reorganizes his sample into foragers and farmers (only 2 pastoral cultures were included in his sample and are omitt in the table). The mean forager living space per person is substantially lower than the mean in farming cultures (t=2.90, df=33, p=0.00 (two-tailed)). If we include the Efe and Aka data from Table 3.3, household densities are particularly high in the Congo Basin groups (Aka, Efe, Mbuti); forager individuals in the Congo Basin have about 1 sq. m of living space.

Table 3.4. *Comparison of space per person in a typical household of mobile hunter-gatherers and farmers. HRAF data modified from Table 2 in Brown (1987). All sources for the cultures can be found in Brown.*

Ethnic group	Dwelling floor area (sq. m)	Number of inhabitants	Sq. m per person
Mobile hunter-gatherers			
Andamans	223.3	90.0	2.5
Chukchee	30.2	6.5	4.6
Copper Eskimo	12.9	5.0	2.6
Klamath	41.7	12.0	3.5
Mbuti	2.0	6.0	0.3
Ojibwa	10.0	7.0	1.4
Ona	7.7	7.2	1.0
		MEAN	2.3 sq. m (24.8 sq. ft)
		SD	1.5
Farmers			
Amhara	30.2	5.0	6.0
Aymara	7.0	4.7	1.5
Bemba	15.1	4.2	3.6
Cagaba	12.6	2.0	6.3
Ganda	55.5	3.0	18.5
Garo	56.0	4.6	12.2
Hausa	11.3	2.3	4.9
Highland Scots	20.8	5.1	4.1
Iban	101.3	6.1	16.6
Ifugao	10.0	3.0	3.3
Iroquois	28.1	8.0	3.5
Kanuri	11.5	1.4	8.1
Kapauku	23.7	11.3	2.1
Khasi	55.5	4.7	11.8
Korea	59.4	5.7	10.4
Lau	34.0	4.8	7.1
Pawnee	181.5	27.7	6.6
Serbs	41.9	5.0	8.4
Sinhaese	56.2	4.6	12.2
Taiwan Kokkien	146.1	23	6.4
Tarahumara	23.9	4.0	6.0
Tikopia	24.6	6.0	4.1
Tiv	16.6	2.3	7.2
Truk	28.0	10.0	2.8
Tucano	100.0	27.5	3.6
Tzeltal	36.0	5.0	5.0
Wolof	12.6	1.7	7.4
Yanomamo	783.9	153	5.1
		MEAN	7.0 sq. m (75.3 sq. ft)
		SD	4.2

Table 3.5. *Average home size and living area per person in developed countries (modified from Wilson 2017).*

Country	Size of house (usable floor space) (sq. m)	Floor space per person (sq. m)
Hong Kong	45	15
UK	76	33
Japan	95	35
France	112	43
Canada	181	72
Australia	214	89
Denmark	137	65
Germany	109	55
Sweden	83	40
China (urban only)	60	20
Russia	57	22
Italy	81	31
Spain	97	35
Greece	126	45
U.S.	201	77
MEAN	111.6 sq. m (1201.2 sq. ft)	45.1 sq. m (485.4 sq. ft)

A few other things are important to remember about many forager houses. Most houses are primarily for sleeping and maybe cooking, and people spend most of the daylight hours outside of the house. Wiessner (1974) suggested that this may be why forager houses are smaller than those found in other small-scale cultures, but an issue with this proposition is that people in many, if not most, small-scale horticultural cultures spend most of the day outside of their homes and only use the house for sleeping, cooking, and storing food and wealth items. Also, many temperate and tropical mobile hunter-gatherer homes are organized into circles or semi-circles, have thin walls of leaves or brush, and do not have rooms or doors that limit access to others.

In order to place sharing of household space in broader cross-cultural perspective, Table 3.5 examines the average household living area per person in developed countries. As with the data on foragers and farmers, considerable variability exists between countries, but average forager household living densities are about 20 times higher than those in developed countries. Farmer living densities and household space per person are much closer to forager densities than they are to those in developed countries. These data may help to explain why scholars in developed countries characterize foragers as living in intimate (this chapter), dense, compact, tight or crowed spaces.

Multiple studies conducted in developed countries indicate that overcrowding can lead to several social and health problems including increases in child mortality, respiratory conditions, social confl mental illness, malaria, and meningitis (Hall 1966; Grove & Hughes 1983; Fuller 1996; UK Office of the Deputy Prime Minister 2004). Overcrowding is defined in several ways, but is often defined as having more than 1.5 people/room or less than 165 sq. ft (15 sq. m) per person (Blake et al. 2007). Only about 3 per cent of U.S. households live with less than 165 sq. ft per person. Using this criterion, all foragers and all but two farming cultures live in overcrowded conditions.

Anthropologists have examined the relationship between space available per person and social pathology and Draper's (1973) !Kung case study and Brown's (1987) cross-cultural research with 36 non-industrial societies do not find any support that 'crowding' (i.e. less space per person) leads to more social pathology or harsher child rearing practices. Overcrowding in developed countries is often a measure of poverty. The data from small-scale cultures suggests that humans can and prefer to live in very intimate conditions but that dense living in developed countries is often not by choice and a consequence of poverty and pronounced political-economic inequality which leads to the lack of access to essential health and education resources.

Sharing space in a bed

Ethnoarchaeologists and social-cultural anthropologists have measured settlement and household living spaces, but few have examined the density of shared space in a bed. Ethnoarchaeologists have measured bed sizes but do not provide data on the number of people in each bed while cultural anthropologists have listed the number of people sharing a bed but not the size of the bed (Shweder 2004). We conducted one of the few systematic studies that examines both bed size and the number of people in a bed among the Aka foragers and Ngandu farmers. We measured 34 Aka and 69 Ngandu beds and recorded the number, sex, and age of individuals sleeping in each bed (Hewlett & Roulette 2014). Table 3.6 provides the average size

Table 3.6. *Average space per person in a bed among Aka hunter-gatherers and Ngandu farmers (Hewlett & Roulette 2014).*

	Aka	Ngandu
Average size of bed	0.9 sq. m (10.7 sq. ft)	2.0 sq. m (22.3 sq. ft)
Average number of people in a bed	2.7	2.0
Average space per person in a bed	0.4 sq. m (4.4 sq. ft)	1.2 sq. m (12.8 sq. ft)

Figure 3.1. *Four people co-sleep on an Aka bed.*

and space per person in Aka and Ngandu beds. The Aka have particularly intimate and dense sleeping conditions as each person has less than a half a meter square (about 4 sq. ft) to sleep. Individuals who share a bed often sleep on their sides and touch others throughout the night (Fig. 3.1).

Beds and sleeping spaces per person in developed countries are substantially larger. A single-sized bed is 1.8 sq. m (18.8 sq. ft) in the U.S., 1.7 sq. m (18.2 sq. ft) in the U.K., and 1.9 sq. m (20.3 sq. ft) in Japan. In general, developed countries have more space per person in a bed than either the Aka or Ngandu and have 4–5 times more space per person in a bed than do the Aka.

Sharing interpersonal space: touching

Hall (1966) was one of the first anthropologists to examine how culture influences interpersonal spatial relations. He established the field of study called 'proxemics' and it generated hundreds of studies in several disciplines. He described four spatial distance zones in humans: intimate distance is associated with people one knows very well such as a spouse, close family and friends and ranges from touching to 45.7 cm (touching to 18 in); personal distance is used primarily for occasional acquaintances and ranges from 0.6-1.2 m (1.5-4 ft); social distance is used primarily with strangers and usually takes place within 1.2–3.7 m (4–12 ft); and public distance is for gatherings of strangers and ranges between 3.7–7.6+ m (12–25+ ft). In this chapter, we are particularly interested in the 'intimate' distance because most people in forager settlements are close family and friends (see Bird-David, this volume, for more on the importance of small-scale contexts in forager communities). We focus on touch as this is the most intimate space and likely one of the easiest to quantify cross-culturally.

Hall (1966) hypothesized that people from 'contact' cultures (i.e. Arabs, Latin Americans, southern Europeans) prefer more touch and close distances than those from 'non-contact' cultures (i.e. Asians, North Americans, northern Europeans). Several researchers tested his hypothesis and confirmed his

contact culture hypothesis (see Remland et al. 1995 for a review). Unfortunately, few were actually based on observational research and all were conducted with individuals from developed countries. We thought that one book titled 'Proxemic Behavior: A Cross-Cultural Study' (Watson 1970) might be promising, but it examined proxemics in four groups of international students attending the University of Colorado: Arabs, Latin Americans, Southern Europeans, and Northern Europeans. No small-scale cultures in this study. The few studies of proxemics that were based on observations often used very short video tapes of interactions, often 30-60 seconds, so we do not know the average amount of time people in these cultures or nations touch others during the day. A recent interview-based study by Sorokowska et al. (2017) examined social, personal, and intimate distances in 42 countries and found that social distance averaged 135.1 cm (53.2 in), personal distance averaged 91.7 cm (36.1 cm) and intimate distance averaged 31.9 cm (12.6 in). The paper evaluated several variables to explain the cross-national variability and found that temperature and age correlated with intimate space; older people and people living in warmer countries preferred larger intimate distances than young people and those living in cooler climates.

In this section of the chapter we examine studies of the frequency of one form of intimate space – touching – among the Aka and other mobile hunter-gatherers. Comparative data from farming communities or peoples in other modes of production are presented when possible.

As mentioned in the introduction, we have conducted field studies with foragers and farmers in central Africa and several of us (Hewlett, Boyette and Fouts) conduct research on the daily lives of children in these cultures. Focal follows of children during daylight hours (6 a.m. to 6 p.m.) were conducted in all of our studies and we all coded the instances children were held or touched. Figure 3.2 illustrates the percentage of time (i.e. percentage of 30 second intervals) the hunter-gatherer and farmer children were held or touched during the day.

The comparison shows that from infancy to adolescence that Aka forager children are held or touched substantially more than Ngandu farmer children. Figure 3.2 is limited to holding and touching at various ages. If we include within proximity (i.e. touching or within arm's reach of someone during the day) the percentages jump considerably; for instance, Aka two year olds were within proximity of someone 93.8 per cent of the day, three year olds were within proximity 89.2 per cent of the day, and four year olds were within proximity 80.1 per cent of the day. Comparable studies with Euro-American infants show that they are held / touched considerably less than the Ngandu children; Euro-American young infants are held or touched 12–30 per cent of the day and older infants are usually held less than 10 per cent of the day (Konner 1976; Hewlett 1996; Hewlett et al. 2000). Euro-American infants are often placed in infant carrying devices such as an infant seat, car seat, or crib.

Boyette (2012) examined Aka forager and Ngandu farmer touching in middle childhood and early adolescence in great detail and found that by comparison to farmer children, forager children: touched others more frequently, touched a greater number of individuals, were more likely to touch individuals of different age categories, and were more likely to touch individuals of the opposite sex.

A study of adolescent grief by Bonnie Hewlett (2005) found that touch and holding were key elements to coping with the loss of a loved one among Aka foragers. An adolescent girl explained (2005, 330): 'I cried a lot and after the burial the people in camp listened to me and held me and after awhile the sadness lessened.' By comparison, the Ngandu farmer adolescents seldom mentioned touch and felt better after people started to give them food and material objects.

Lewis (2016, and in this volume) conducted research with the BaYaka foragers, the southern neighbours of the Aka, on how children learn to sing, and described child spirit play singers in the following way: 'Typically, singers sit together with their limbs resting on one another – literally "mixing up their bodies" (*bo. saŋganye njo*), or dance in tight coordinated formations.' Draper (1973, 303) provides a similar quote when she described proximity among the !Kung: 'As people sit in camp, resting, talking, and doing chores, they prefer to gather in knots or clumps, leaning against each other, their arms brushing, the crossed legs overlapping.' Likewise, Radcliffe-Brown (1933, 117) described Andaman Islander greetings: 'When two friends or relatives meet who have been separated from each other for a few weeks or longer, they greet each other by sitting down on the lap of the other, with their arms around each other's necks, and weeping and wailing for several minutes till they are tired. Brothers, father and son, mother and son, mother and daughter, and even husband and wife greet each other this way, with the husband sitting on his wife's lap.'

In terms of other systematic studies of touch in hunter-gatherer childhood, Draper's (1973) observational study of !Kung children under the age 14 found that girls were in physical contact with at least one other person in 57 per cent of observations and boys were in physical contact with someone in 35 per cent of the observations. Hamilton (1981) conducted

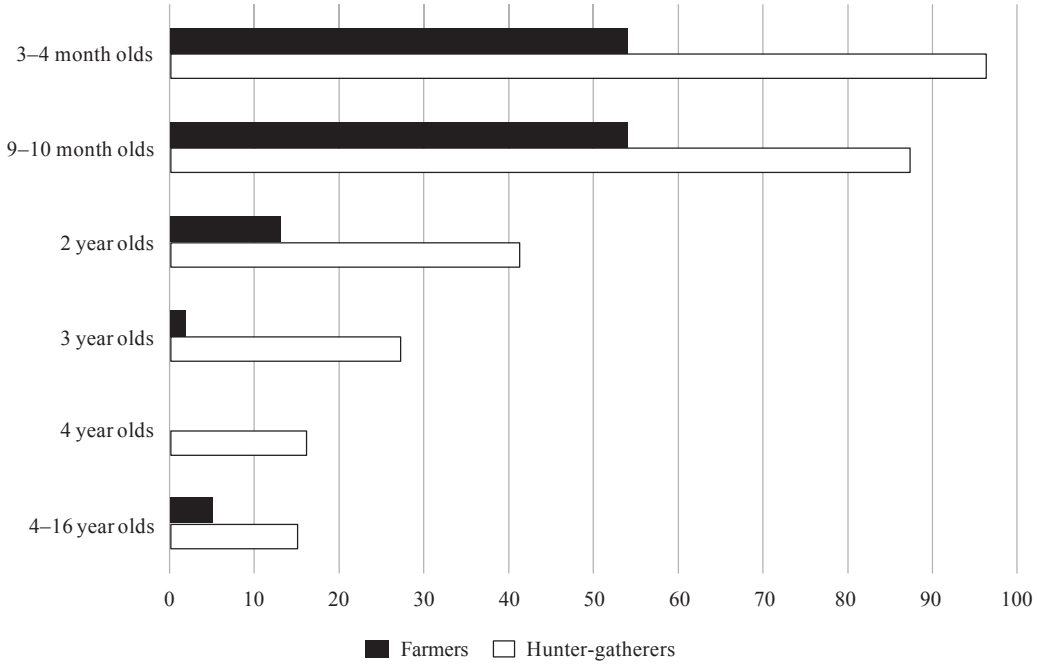

Figure 3.2. *Percentage of time forager and farmer infants, children and adolescents are held or touched during the day (infant data from Hewlett et al. 2000; early childhood data from Fouts, this chapter; middle childhood and adolescent data from Boyette, this chapter).*

a quantitative study of holding/touching among the Australian Gidjingali and found that during daylight hours 0–6 month olds were touched 93.6 per cent of the time, 6–18 month olds 83.2 per cent of the time, and 18 month olds–5 year olds were touched 23.9 per cent of the time. The Australian frequencies of touching are similar to those of the Aka foragers and higher than those for the Ngandu farmers in Figure 3.2.

In another type of systematic cross-cultural study of touch in hunter-gatherer children, Lozoff & Brittenham (1979) reviewed the ethnographies of 187 cultures in the Standard Cross-Cultural Sample (SCCS) for descriptions of holding and other features of infancy. Table 3.7 summarizes some of their results

Table 3.7. *Infant holding and other measures of caregiver sensitivity (modified from Lozoff & Brittenham 1979).*

	Hunter-gatherers (10 cultures)	**Other subsistence modes** (177 cultures)
Infant held > 50% time until crawling	100%	56%
General affectionate care	100%	72%
Immediate, nurturing response to crying	100%	74%

and shows that forager caregivers are much more likely to hold their babies than are caregivers living in other subsistence modes. Their study also demonstrates that foragers are more likely than farmers and others to immediately respond to a crying or fussy infant and to provide affectionate care. Along similar lines, another systematic SCCS study with children of all ages found that hunter-gatherers were significantly more likely to show warmth and affection to their children than were caregivers in other subsistence systems (Rohner 1975). Montagu (1971) also described extensive touching and affectionate care of infants among the Netsilik and other foragers but it was not a systematic study and he did not compare cultures with different subsistence systems.

Few studies exist on touching in hunter-gatherer adults. The most extensive research was conducted by Sugawara (1984) among the G/wi San. It was the first and remains the only systematic study of proxemics among forager adults. He conducted focal follows of G/wi adults and adolescents throughout the day. Table 3.8 summarizes unintentional touching (he omits intentional grooming) and proximity (i.e. within 0.3 m or 12 in.) of male and female adults. Adult males touched others 14 per cent of the day, but most of the touching occurred with other males. When an adult male touched a female, it was usually his wife.

Table 3.8. *Percentage of time intervals G/wi adults touched or were within proximity (0.3 m; 12 in) of other males and females in the camp setting during daylight hours (calculated from Fig. 7 in Sugawara 1984).*

	Touching males	Proximity to males	Total	Touching females	Proximity to females	Total
Adult Males	11%	25%	36%	03%	09%	12%
Adult Females	02%	11%	13%	11%	22%	33%

Table 3.9. *Percentage of time G/wi adolescents touched or were within proximity (0.3 m; 12 in) of other males and females in the camp setting during daylight hours (calculated from Fig. 9 in Sugawara 1984).*

	Touching males	Proximity to males	Total	Touching females	Proximity to females	Total
Adolescent Males	30%	25%	55%	02%	05%	07%
Adolescent Females	02%	04%	06%	22%	28%	50%

Likewise, adult females touched others 13 per cent of the day, but 85 per cent of the touching was with other females and when women touched a male it was usually her husband. If we consider both touching and within 0.3 m or within arm's reach, G/wi males were 'intimate' with someone 48 per cent of the day and female adults were intimate with someone 46 per cent of the day.

G/wi adolescents spent even more time in intimate space with others than did G/wi adults and, as one might expect, the same sex preference also existed. Table 3.9 outlines Sugawara's results and shows that adolescent males spent 62 per cent of the day in intimate space (touching or within arm's reach) with someone else and adolescent females spend 56 per cent of the day within reach of someone else. If adolescents were in intimate space with someone, 90 per cent of the time it was with same sex individuals.

Sugawara (1984) also examined the relationships between people who touched and found that of the dyads that touched at least once, 41 per cent of them were touching genetic kin, 41 per cent of them were touching affines, and 18 per cent of them were touching non-kin (calculated from data in Table 9 in Sugawara).

It is interesting to note that ethnoarchaeologist Binford (1978) also calculated proximity among Nunamiut adult males. He measured the distance between the left and right knees of men seated next to each other around a fire and found that men seated in groups of 3–4 sat 33 cm (13 in.) apart but when the size of the group increased to 5 men the average distance dropped to 24 cm (9 in.); they spent most of this time eating and talking. These measures fall within the 'intimate' zone described by Hall (1966).

We were unable to find all-day observational studies of touch in adults in developed countries similar to those conducted by Sugawara (1984). Hundreds of experimental psychology and therapeutic studies of touch exist in developed countries and they have identified an array of positive physical and mental health benefits of touch including: a) various emotions can be communicated by simple touch (Hertenstein et al. 2006); b) lower levels of touch during childhood can influence the development of depression (Takeuchi et al. 2010); and c) children are more likely to express positive emotions when they are touched more often (Bai et al. 2016). We know from the previous sections that houses and beds in developed countries are large, the section below shows that children in developed countries seldom co-sleep after infancy, and most places of employment in these countries seldom allow touching. Overall, it implies that touching during the day or night in developed countries is likely to be infrequent by comparison to the frequencies of touching for children and adults in foragers.

In terms of touching at night, an observational study of Aka and Ngandu found that Aka children and adults rarely slept alone and were touching someone throughout the evening. Ngandu farmers regularly co-slept but adolescents and adult males were more likely than the Aka in these groups to sleep alone (Hewlett & Roulette 2014). By comparison, the frequency of co-sleeping with infants in the developed world varies substantially, but if one examines co-sleeping beyond infancy only 5–23 per cent of 5- to 11-year-old children and 2–4 per cent of adolescents in the developed countries share a space and touch others at night (Yang & Hahn 2002). Most children in these groups would be considered 'deprived' by both Aka and Ngandu standards, by which all children under the age 11 co-sleep with someone.

In a cross-cultural study of husband-wife co-sleeping, Whiting & Whiting (1975) found that hunt-

Table 3.10. *Husband-wife co-sleeping in hunter-gatherers versus other modes of production (modified from Whiting & Whiting 1975).*

	Hunter-gatherers (26 cultures)	**Other subsistence modes** (115 cultures)
Husband and wife sleep together	96%	57%
Husband and wife sleep apart	4%	43%

Table 3.11. *Average frequency of sex per week among married couples in three age groups among Aka foragers, Ngandu farmers and U.S. middle-class market economists.*

Age	**U.S. market economists**	**Ngandu farmers**	**Aka foragers**
18–29	2.2	4.0	7.3
30–39	1.7	4.4	8.4
40–45	1.3	2.1	5.4

er-gatherer spouses were much more likely to co-sleep than spouses in other modes of production (Table 3.10). This means that men in non-forager cultures sometimes sleep alone (like Ngandu men mentioned above) and that adult females in these groups sleep with the children. Among foragers, it means that children are more likely to co-sleep with both parents rather than only mother. The Hewlett & Roulette (2014) study found that forager children before adolescence usually co-sleep with another adult whereas farmer children were more likely to sleep with mother or other siblings.

Finally, the most intimate form of physical contact is sexual intercourse. Few studies exist on forager sexual behaviour, but a study among Aka and Ngandu married couples found that Aka couples had significantly more frequent sex than the Ngandu; the Aka averaged sex 3.0 times per night and the Ngandu 2.2 times per night (Hewlett & Hewlett 2010). Aka explained that sex was primarily to search for a child rather than for pleasure. One Aka man said 'The work of the penis is the work to find a child' (2010, 112). Frequency of sex is seldom described in the ethnographic record, but one forager ethnographer, Roheim (1933), reported that Aranda of Australia had sex 3–5 times a night. Sexual behaviour researchers in developed countries do not even ask how often a couple has sex per night; they usually ask informants about how often they have sex per week or month. Consequently, comparable data on sex per night from developed countries does not exist. But it is possible to convert the Aka and Ngandu data into frequencies per week because they reported frequencies per day and as well as the number of days between sex. Table 3.11 shows the average frequency of sex per week among three age categories of married couples in three populations. The table demonstrates that the Aka have substantially more frequent sex and intimate physical contact on average than either of the other two groups.

Hypothetical implications of intimate living

We have explored shared space in forager settlements, houses, beds, and interpersonal relations. Impressive and important cross-cultural and intracultural diversity exists in each domain, but the limited data we were able to locate indicate foragers generally have more intimate living environments than do peoples in other modes of production. We now turn to a discussion of biological, psychological, social, and cultural consequences of forager intimate spatial environments. The implications are hypothetical because we or others have not directly evaluated the relationships.

Oxytocin

Touch impacts human feelings and social behaviour through an array of neurobiological systems (Olausson et al. 2016; Field 2014), but here we focus on oxytocin. Oxytocin (OT) is a mammalian hormone and neuropeptide made in the hypothalamus and released into the blood supply from the pituitary. Originally, it was thought to be primarily a female reproductive hormone that played critical roles in childbirth (influencing cervical dilation and uterine contraction), lactation (letdown reflex), and maternal nurturing (reducing stress and increasing attention to the newborn). Recent research has shown that OT influences both males and females and that in addition to childbirth and breastfeeding, several other behaviours increase its expression: skin-to-skin contact, pleasant touch (e.g. hugs, massage, holding hands), and intercourse (Carter 2014; Feldman et al. 2013). Researchers have also demonstrated that OT increases human trust (Kosfeld et al. 2005; Zak et al. 2005), generosity (Zak et al. 2007), empathy (Carter et al. 2009), and pair bonding (Williams et al. 1994). Studies in Israel show that sensitive care in infancy (touch, affect, vocalizations) by parents influences a child's OT levels and a child's sharing with friends three years later (Feldman et al. 2013). The expression of OT and its interactions with the genetically similar vasopressin, which is associated with defence and aggression, are complex, but most researchers agree that OT increases with various forms of intimate touch and that OT promotes prosociality (e.g. sensitive care, giving, trust, attention to social stimuli, social connectedness) and decreases stress (blood pressure and cortisol levels) in humans (Carter 2014; Gettler 2014). Reduction of stress (cortisol levels) may be particularly important because interpersonal

conflicts, illness, death, and other stressors, permeate forager life.

The hypothetical implication for hunter-gatherers is that their culturally constructed intimate living environments may contribute to regular expressions of OT and decreased levels of cortisol. This may promote higher levels of interpersonal trust, giving, and cooperation, such as those proposed by Bird-David (1990) and documented by Gurven et al. (2002) and others. OT may enhance generous sharing of a) food, b) allomaternal care, and c) knowledge/information. Feelings and behaviours generated by OT may also decrease stress (cortisol) in daily life and reinforce cultural norms and foundational schema of sharing. OT has seldom been measured in foragers (see Jaeggi et al. 2015 for exception), but one of the only studies of diurnal cortisol levels among Tsimane foragers indicates that their cortisol concentrations are lower than any known group (Nyberg 2012). Overall, OT is a potential amplifier and feedback mechanism to forager cultural systems of cooperation and sharing.

Cultural models of trust and egalitarianism

Attachment theory (Bowlby 1969) is one approach developmental psychologists use to explain how children develop feelings and views of self and others. John Bowlby was interested in explaining the intense distress, anxiety, and despair infants exhibited when separated from primarily caregivers. He hypothesized that infants' fussing, crying, crawling, or reaching for others functioned to maintain proximity to caregivers and that this strategy was designed by natural selection to promote the safety and survival of infants. Research in several cultures supports the universality of the attachment system, as infants in all cultures demonstrate attachment behaviours towards specific others by late infancy (Main 1990). The development of what Bowlby called 'internal working models' of self and others is part of the attachment process. Children who receive consistent, prompt, sensitive and att ive care tend to feel more secure about their world and their environment with others. As children's memories and information-processing capacities mature and repeated child-caregiver interactions occur, the child develops internal working models of self and others. Children with caregivers who are warm, attentive, take the child's perspective, perceive their signals and interpret them correctly, and react promptly and contingently develop trusting internal working models. Children who receive inconsistent care develop a sense of self that is insecure and mistrustful of others. Children with trusting views of others are more likely to explore their environments and become more autonomous.

Internal working models are one type of cultural model discussed in the introduction. They are socially acquired (via lived experiences with others in the culture) knowledge and feelings that provide a baseline for understanding and predicting the intentions of others. They emerge in a context of multisensory (e.g. touch, body, smell, eye movements) communication. The cultural models based in the attachment process tend to be conserved over time, but can change if the environment changes later in life (e.g. divorce, illness).

In relation to this chapter, we have demonstrated that Aka foragers are much more likely than Ngandu farmers to hold or touch their children at all ages (Figure 3.2), and that cross-culturally hunter-gatherer caregivers are more likely than caregivers in other modes of production to hold their infants, respond quickly to a fussing infant, and be more affectionate. In a separate paper, we also demonstrate that Aka infants are more likely than Ngandu infants to be breast-fed on-demand, nursed by other women, and responded to much more rapidly when they fuss or cry (Hewlett et al. 2000). Foragers invest heavily in holding and maintaining proximity to children, but it does not mean that Aka and other hunter-gatherers have child-focused rearing patterns. Caregivers provide attentive care but children are not the centre of attention most of the day; men and women care for children as they go about their daily activities and most adults spend most of their time interacting with other adults, often of the same gender.

We argue that the intimate shared space during the day and night, the high frequency of touching, along with the sensitive care, contribute to hunter-gatherer internal working models (or cultural models) of trust of self and self with others. Our approach provides mechanisms for understanding how hunter-gatherers acquire what Bird-David (1990) calls pan-forager metaphors (what we call cultural models) that contribute to extensive food sharing in foragers.

It is also important to note that the foundational schemas of autonomy and egalitarianism also contribute substantially to the development of trust in self and others. Trust and autonomy established in infancy and early childhood are built upon in middle childhood and adolescence because cultural schema promote autonomy, giving and egalitarianism. Forager caregiving is indulgent, especially in infancy and early childhood, but as children grow older they are free to do pretty much what they want. Parental control is minimal, children are free to learn as they participate in adult activities, and they are consistently reminded that they are not better than others. By contrast, parents in the developed world may emulate hunter-gatherer sensitive care in infancy, but

the children then move onto preschools and formal education systems where respect for autonomy is typically limited and inequality pronounced. Teachers and other adults are in control and children are ranked on a daily basis (i.e. receive grades) which means some children are better/worse than others. The ranking and limitations of autonomy impact how children feel about themselves and others.

The intimate living environment of foragers may also play a role in establishing and maintaining the foundational schema of egalitarian gender relations. Nancy Chodorow (1974) predicts that in cultures where men/fathers are intimate identity figures for boys/sons (consistently nearby and available, like women/mothers are to their girls/daughters), and men/fathers are active participants in infant care, that the boys growing up will know precisely what it is like to be male and less likely to devalue tasks and roles of women. If men have an intimate idea of what it is like to be a man in many contexts, they are less likely to degrade those things associated with being a woman. Males who grow up primarily with women learn what it is like to be a woman in many contexts, but as they mature and are expected to acquire a masculine identity, their knowledge of what it means to be male, especially in diverse contexts, is often vague and imagined. They use female tasks and roles to define what men do not do; for example, being a man means not cooking or holding babies. Cross-cultural studies support her hypothesis and indicate men in low-male involvement cultures are more controlling and less egalitarian (e.g. females excluded from public decisions) (Coltrans 1988).

Hunter-gatherer intimate living means young boys usually have several adult males around within easy viewing distance, if not touching or within arm's reach. Even if a boy's own father is not around, due to divorce, death, or he likes to travel, it is easy to observe many other adult males in camp. Young boys are very familiar with what it is like to be male in many contexts, observe males doing female tasks in particular contexts (e.g. flexibility in gender roles), often co-sleep with their father and mother, and consequently do not devalue those tasks or things generally associated with females. Evidence consistent with this perspective comes from cross-cultural studies that show that hunter-gatherer fathers are more likely to provide direct care of children than fathers in farming and pastoral cultures where male salience is lower (Marlowe 2000).

Empathy

The discussion about attachment theory and how it contributes to internal working models of self and others assumes that humans have an evolved capacity to read and share the intentions of others, often called 'theory of mind' (Tomasello 2001). This ability is associated with characteristic features of our humanity: cooperation and empathy for others (see Spikins, this volume). The evolved propensities for empathy interact with culture, such as the four spatial domains in this chapter. We hypothesize that cultural environments of intimate living amplify an individual's empathy for others. They sleep with, touch, see, hear, smell and closely interact with everyone in the settlement in a variety of contexts. The shared spaces increase the depth and breadth of empathy for a broad range of others.

Social learning

Social learning is basically acquiring skills or knowledge from others rather than learning them on your own. It is a distinguishing feature of our humanity and has enabled humans to adapt to diverse environments around the world. Social learning in non-human animals is generally limited to a few traits, often linked to finding food or mates, but in humans it involves acquiring thousands of traits, including subsistence skills, cultural models, and kinship systems. Intimate living as described in this chapter can influence social learning in several ways (see Tostevin, this volume, for greater description of social learning of technologies).

Firstly, the proximal living with many others means that children or adults have easy access to multiple models from whom they can learn (i.e. observe, imitate and provide demonstrations). Many others can comment or guide an individual trying to learn a skill or particular knowledge. For instance, our study of teaching among the Aka found that caregivers often turned infants sitting on their laps outwards towards all others in the settlement; we called this 'distribution teaching' because multiple others in the camp then engaged and communicated with the infant (Hewlett & Roulette 2016).

Secondly, the intimate living can contribute to mechanisms of transmission that promote the high fidelity of skills and knowledge. The ability to observe many others in a settlement, house, bed, or while touching, means that individuals can easily cross-check what they are learning with different models, obtain comments from a broad spectrum of people or easily observe and copy what the majority in camp is doing. Evolutionary theorists have emphasized that high-fidelity social learning is key to humans' ability for cumulative culture, i.e. to expand and build upon previous skills and knowledge (Lewis & Laland 2014).

Thirdly, intimate living helps to explain the nature of social learning in foragers. Our study of teaching among the Aka found that teaching episodes

were very short, usually lasting a few seconds, subtle, often non-verbal (e.g. pointing or moving the body), and occurred while touching (Hewlett & Roulette 2016). Individuals in a settlement know each other very well which means that learning can often take place rapidly through non-verbal communication (i.e. eye or body movements). Anthropologists from developed countries interested in social learning may be missing critical features of social learning in foragers because formal education systems and cultural models of learning in developed countries emphasize verbal explanations.

Fourthly, dense living and frequent touching augments intimate knowledge of others (their emotions, personality, trust) which provides teachers (anyone who modifies his/her behaviour to enhance learning in another) the opportunity to easily build upon what learners already know (called 'scaff in the social learning literature). Intimate knowledge of others also enables teachers to minimize their investment; in other words their modifications of behaviour can be brief, subtle, non-verbal. The pronounced trust of others that emerges from intimate living also means that learners trust their teachers and that the teachers trust the abilities of learners. Research has shown that trust on both sides promotes rapid social learning (Harris 2015).

Finally, sharing is a foundational schema among the Aka and many forager groups, but all domains of sharing require social learning. Individuals have to learn social norms of food sharing or how to cooperate in subsistence activities before extensive giving or cooperative activities can occur. Children have to learn how to provide sensitive care to infants to promote the kinds of trust described above. Foragers also have to learn how to share space with others in a settlement, house, or bed.

Sharing and cooperation in other domains

All of the impacts described above can promote sharing and cooperation in other domains, such as food sharing, allomaternal care, and knowledge. The impacts discussed above are mostly unconscious or unintended consequences of the intimate shared space. By contrast and described in the settlement section of the chapter, archaeologists and human behavioural ecologists suggest a more explicit reason; foragers live close to each other so they can monitor what other have or do not have to share (Whitelaw 1991; Gould & Yellen 1987; O'Connell 1987). Anyone who has lived with foragers knows that not everything is shared and that some individuals try to rapidly consume or conceal what they have acquired so they do not have to share with others (see Marlowe 2010 for examples from Hadza). This hypothesis is limited to sett density and has not been applied to sharing space in a house or bed or to why foragers of all ages frequently touch.

Hypothetical impacts of intimate shared spaces among foragers are discussed above, but it is important to remember that they likely interact and influence each other. Cultural models of self and others promote trust and sharing of intimate spaces with others and the sharing of intimate spaces may increase the amount of touching and OT levels. In terms of food sharing, the primary topic of sharing in the hunter-gatherer literature, it should be clear that all of the proposed impacts described above can increase the frequency, scope, and intensity of giving and sharing.

Summary and conclusion

This chapter explored shared space in forager settlements, houses, beds, and interpersonal relations. Limited data existed on these topics but, in general, foragers shared intimate space across a variety of domains. Some statistical evidence existed in two (household density and touching) of the four domains that foragers share intimate space more frequently than do food producers. The quantitative data in the other two domains (sett and bed density) were consistent with this patt (foragers more intimate) but we were unable to find many comparable data on food producers. We anticipated that foragers would be intimate in some domains, such as the frequency of touching in infancy, but when we pulled the data together and compared foragers with food producers we were surprised by the levels of forager intimate living across a variety of domains. Aka young children were within an arm's reach of someone between 80 and 94 per cent of daylight hours, G/wi adolescents were within reach of someone 62–56 of the day, and foragers averaged about 2 sq. m of living space in a house by comparison to 45 sq. m for people in developed countries. Studies with Australian foragers demonstrated that intimate living may not occur across all domains.

The secondary aim of the paper was to consider possible ways in which the shared spaces impact and interact with other features of forager life including food sharing. We identifi biological (oxytocin, cortisol), psychological (development of trust and empathy), and cultural (social learning) factors that may be impacted by intimate living. Several if not all of these factors could amplify, often unintentionally, and provide feedback loops, to giving and sharing in other domains (Fig. 3.3).

Why intimate living? The chapter identifi ecological (monitoring others, wild animal predators, cooperative subsistence activities), cultural (models

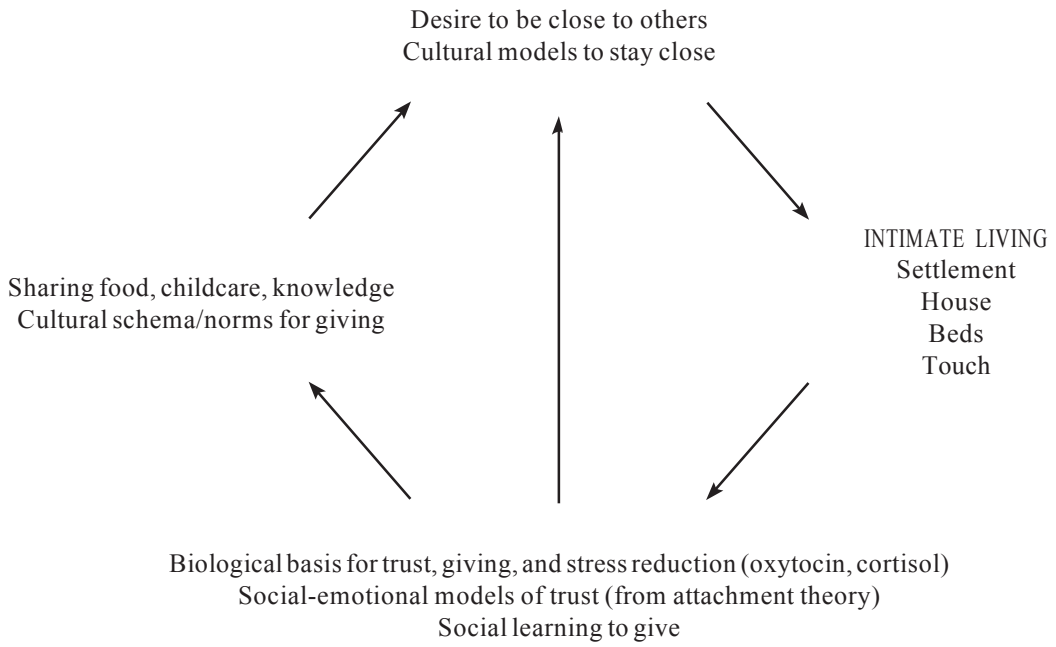

Figure 3.3. *Feedback loops between intimate shared spaces and other forms of sharing.*

and norms about sharing space), and biological (endocrinology) variables associated with forager intimate living, but only factors associated with settlement density – predators, cooperative subsistence activities, monitoring, food sharing – have been evaluated systematically by archaeologists (e.g. Whitelaw 1991). We do not have the space here to review the studies of these variables, but we offer a few alternative hypotheses to those presented by archaeologists to explain sett density.

Learning to trust

For children in particular, the intimate living environment provides a multi-modal (biological, psychological, cultural) environment to learn trust, empathy, and cultural models that amplify the frequency and scope of sharing food, childcare, and knowledge.

Promote and maintain giving

Cultural schema and models promote sharing and giving, but the intimate living environment provides critical feedback that promotes and maintains giving and sharing.

Intimate living across the four domains presented can increase the depth and breadth of knowledge, empathy, trust, and att ('bonds') to others. This can enhance sharing food and childcare, cooperation in subsistence and other activities, and rapid social learning. Social learning will be more effi and rapid if members of the group deeply know, empathize with, and trust each other. Sharing/giving will be more extensive if a person trusts that others will do likewise in the future. Subsistence and other forms of cooperation are more effi if participants can empathize and know each other very well; they can read each other's intentions and non-verbal communication, as well as know each other's strengths and weaknesses.

Intimate living can also at times be viewed as a form of 'silent demand' where individuals stay close to particular others in order to obtain a share of resources or learn new skills (Løgstrup 1997; Widlock, this volume).

We should mention that intimate living has costs, such as the increased exposure to diseases of contact and difficulty hiding wealth or food resources from others, but overall, the benefi of food sharing and other forms of cooperation noted above outweigh the costs.

Why are forager living environments generally more intimate than that of food producers?

Daily food sharing and cooperation beyond the household occur less frequently in food producing cultures than they do among foragers in part because food producers use storage of food and other resources to buff variability. The biological, psychological, and cultural feedback loops of trust, empathy, and social learning may be less important

to making a living in food producing cultures so the need for intimate living spaces are not valued as much. Substantial diff exist in the daily realities of foragers and farmers; foragers live in a one-room dwelling and have constant visual/aural tracking of people in other dwellings whereas food producers often live in multi-room dwellings and or have signifi visual distances between neighbours. Likewise, the especially pronounced lack of intimate living environments in the developed world may refl the decreasing importance of trust and empathy due, in part, to sharp declines in the importance of daily sharing and cooperation beyond the household. Like storage in food producers, peoples in developed countries have developed political-economic institutions to deal with risk and making a living. One might suggest that those living environments in developed countries are 'touch deprived' and may help to explain why they have a variety of industries trying to remedy the lack of touch (e.g. massage therapy, att parenting, holding pets). One could hypothesize that the living environments in developed countries not only lack the biological-psychological-cultural feedback loops that support sharing and cooperation, but that the constructed environments also lead to their own selection pressures which may contribute to the disappearance of human cognitive abilities for trust and empathy.

We want to note that some scholars hypothesize that forager sett are compact or that their houses or beds are small and dense because they are always moving (Brown 1987; Ember 2017). Mobility may play a role, but we want to point out that if a forager did not want to share space with others in a camp, house, or bed, it generally does not take much time or energy (in environments with vegetation) to build a home far away from others or to make a bed of leaves, skins or logs to sleep alone. It may take an hour or so to build lean-to or dome-shaped house and less than 30 minutes to make a separate bed. Our years of experiences with the Aka and other hunter-gatherers suggest that people could easily increase their living space if they wanted, but they prefer to be physically close to others.

Finally, this chapter broadens our awareness of space as a way to view complex feedback loops between the biological and social, and intersections between adaptive patt and individual choices in daily practice. Thus, intimate spaces have made forager life successful over evolutionary time and enjoyable (see also Lewis, this volume, on economies of joy) and sustainable in the proximate timescale of daily life.

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