Children’s Play and the Integration of Social and Individual Learning: A Cultural Niche Construction Perspective

Adam Howell Boyette

Abstract

In this chapter, I explore the integration of imitative and creative aspects of children’s autonomous play as a means of examining the evolved psychology for learning within a culturally constructed niche. I investigate whether children’s play tracks expected pathways of cultural transmission across a small sample of foraging and agrarian societies, and what the settings of Aka forager and Ngandu farmer children’s play reveal about the daily lived experiences that lead to culture learning—especially the role of collaborative learning across middle childhood. My cross-cultural analysis supports the hypothesis that social stratification is associated with horizontal social learning as represented by the frequency children play games. Additionally, however, a high percentage of play across the cultures analyzed represented spontaneous, creative play, indicative of a strong and universal preference for individual learning, which is conducive to innovation. My analysis of the settings of Aka forager and Ngandu farmer children’s play problematizes the idea that vertical and oblique cultural transmission is in practice the movement of information from older to younger individuals. In fact, children’s imitation of traditional (i.e., learned from adults) activities in play often occurred away from adults. These results are discussed in light of previous studies of play and cultural transmission.

Keywords

Play • Learning • Cultural niche construction • Cultural transmission • Foragers

13.1 Introduction

In 2008, in the Aka forager community where I was living at the time, I watched two boys of roughly 7 and 10 years old climb a tree in the midst of play. The older boy had assembled a miniature replica of the pendi bark basket adults typically use in honey gathering. The two then tied a long forest cord to the pendi and ascended the tree to perform the conventional motions of chopping a hole in a limb to open the bees’ nest, pulling up the pendi, and filling the leaf-lined container with “honey” to be lowered down to those waiting below.

There is still debate about the functionality of children’s play. For example, questions remain as to whether it has immediate or deferred benefits for the player or whether multiple functions exist to typical play behaviors (Martin and Caro 1985; Pellegrini and Smith 1998b). However, there is reasonable consensus among those approaching the study of play from an evolutionary perspective that the types of play constituting the Aka boys performance described above have adaptive qualities (or at least they must have in the past) and that these are likely related to learning in a broad sense. For example, object play is hypothesized to enhance future tool use skills (Pellegrini and Bjorklund 2004),
whereas physical play may have immediate implications for neuromuscular, cognitive, or social development (Byers 1998; Byers and Walker 1995; Pellegrini and Smith 1998a).

However, as exemplified by the Aka boys’ fantasy honey gathering, the manifestation of these potentially functional behaviors in play is not universal—for example, Ngandu children, who grow up in the same environment as the Aka, never play honey gathering—and the learning or development they may support is not modular but highly integrated, here into the performance of honey gathering. In other words, play is motivated, organized, and imbued with meaning by culture. Reciprocally, children learn the values, skills, and ways of thinking of their culture through creative and re-creative, often collaborative, performance in play (Lancy 1980; Roopnarine and Johnson 1994).

In this chapter, I explore the integration of imitative and creative aspects of children’s play as a means of examining the evolved psychology for learning within a culturally constructed niche. I investigate (1) whether children’s play tracks expected pathways of cultural transmission across a small sample of foraging and agrarian societies and (2) what the settings of Aka forager and Ngandu farmer children’s play reveal about the daily lived experiences that lead to culture learning—especially the role of collaborative learning among children across middle childhood.

### 13.2 Cultural Transmission Theory, Evolved Psychology, and Play

Prior to my observation, the children in the anecdote above had seen honey gathering performed by older boys and men numerous times since they were infants. It is an exciting activity, involving immense skill and cooperation between several individuals, ending in the sharing of a highly valued resource. In autonomously choosing this play activity, the boys have revealed a preference in this instance to imitate a traditional activity learned from the observation of older members of their community. According to cultural transmission theory, individual choices of whom to learn culture from, or whether to learn on one’s own, should not be random but biased toward a preference for what will most likely lead to the most advantageous skills or knowledge. There are advantages to learning from specific others in certain environments, as well as trade-offs between learning from others (i.e., social learning) and individual learning (Boyd and Richerson 1985; Cavalli-Sforza and Feldman 1981).

In this study, the environment is conceived of as both a natural ecology that is to some degree changed by human behavior and a social ecology that is itself an arrangement formed by humans as a solution to the problem of living in the world (Odling-Smee et al. 2003). In choosing whom to imitate, children must attend to the fact that individuals in their group will vary in the extent that they know certain information about their shared environment. In general, children learn much from their parents (vertical transmission) and from other adults (oblique transmission). When the environment is relatively stable, information tends to be widely distributed, and parents and other adults are likely to be equally good sources, though nonparents, such as experts, might be preferable should aspects of the environment begin to change and relevant information become less widely distributed (McElreath and Strimling 2008). For example, while Aka children report to learn many things from their parents, knowledge of new technology might be acquired from other adults (Hewlett and Cavalli-Sforza 1986).

Children also learn from their peers (horizontal transmission). While some have argued that peers are the primary source of culture learning for children (Harris 1995), the environment is certain to play a role. For example, transitioning from a mobile foraging to a sedentary farming economy is associated with children spending more time with peers and less time with adults (Draper and Cashdan 1988). Additionally, it may be advantageous to learn only certain cultural domains from peers instead of adults. Sedentary living is often accompanied by hierarchical, status-based social structures. Since age is often a component of status, peers, not adults, are whom children will be competing and cooperating with to achieve social dominance. Therefore, domains related to social dominance may become important features of “children’s culture” in those contexts and not learned from adults. For example, symbols of status or norms of competition and cooperation may change between generations. In contrast, for mobile foragers, cooperation between and within generations is normative, and much greater overlap between what is socially learned from adults and children might be expected.

In general, social learning, whether from adults or peers, avoids the time and effort required to learn something individually through trial and error, but it entails the risk of copying maladaptive behavior—a risk that increases with the pace of environmental change. While slower and entailing greater risk, individual learning is essential to the generation of innovations and crucial to adapting to new environments. Since each has its advantages, theory suggests individual and social learning are expected to be found in a stable equilibrium in cultural populations (Boyd and Richerson 1985; Enquist et al. 2007; Maital and Bornstein 2003).

Few studies have sought empirical evidence for these trade-offs in the daily lived experiences of young culture learners (Hewlett et al. 2011). Yet, it is through children’s
activities and social interactions throughout development that culture is reproduced and new culture is potentially created. Similar to other perspectives emphasizing the interaction between knowledge and action (Bateson 1972; Bourdieu 1977; Giddens 1984; Ochs 1988; Vygotsky 1978), the cultural niche construction perspective applied here holds that culture and lived experience (e.g., habitus) create each other. However, cultural niche construction makes explicit that learning is guided by evolved proximate (i.e., psychological) mechanisms that motivate behavior and that these are shaped by the environment through natural selection and ontogeny (Boyd et al. 2011) but also that individuals are active creators and re-creators of the selective and developmental environments in which learning occurs (Odling-Smee et al. 2003).

If playing serves a culture learning function, it is expected that children’s autonomous decisions of whom to play with and what to play should reflect their evolutionarily informed learning goals—that is, their environmentally sensitive preferences for the best people to imitate or whether to imitate at all. If there are advantages to specific cultural transmission modes and trade-offs between social and individual learning depending on the environment, children’s psychology should be sensitive to information relevant to making adaptive decisions, and they should be motivated to learn—and play—accordingly. Below, to test this proposal, I examine my own and others’ cross-cultural data on children’s time spent in play. In my analysis, I consider children’s play activities to represent three pathways to culture learning based on the framework of cultural transmission theory: (1) imitation of behaviors observed performed by adults (vertical or oblique social learning), (2) imitation of other children (horizontal social learning), or (3) performance of creative, idiosyncratic behaviors not based on conventional, observed behavior (individual learning).

I also examine the content of play among the Aka and Ngandu in relation to social context to explore where and around whom play is performed. Previous empirical studies of cultural transmission have used interview methods to determine the sources of individuals’ knowledge or skills (Auinger 2000; Demps et al. 2012; Hewlett and Cavalli-Sforza 1986; Reyes-García et al. 2009) and tend to find that informants, children or adults, can name a single individual as the source of what they know. However, this method does not adequately capture the collaborative nature of culture learning (Lancy 2012)—it measures the ultimate cultural transmission mode, but not the proximate social learning process (Hewlett et al. 2011). For example, the Aka boys may have observed their fathers gathering honey, but their own autonomous and collaborative play helps them internalize the act and social meaning of honey gathering (Tomasello et al. 1993). Thus, ultimately, honey-gathering play, for example, represents transmission via the vertical or oblique mode, but, proximately, it is at least in some part through collaboration with peers that learning occurs.

### 13.3 Play in the Forager Culturally Constructed Niche

The “environment” as discussed so far can be seen as a culturally constructed niche. The culturally constructed niche refers to the ecological, material (e.g., structures, artifacts), and cultural (e.g., values, ideologies) contexts in which social interactions take place in a community. Mobile, immediate-return foragers are raised in physically and emotionally intimate contexts. Communities typically have 25–50 members during much of the year, and children are socialized to trust many others. They are included in subsistence and social activities from a young age and are given the autonomy to learn from whomever they wish. Additionally, egalitarian social relations are highly valued and competition discouraged. Foragers practice prestige avoidance and strive not to draw attention to themselves (Hewlett 1991). Selfishness, aggression, and boastfulness are sanctioned through teasing or terse vocal feedback—very rarely violence (Wiessner 2005).

Among the Aka and Mbenjele foragers of the northern Congo Basin, the concept of “play” is not separable from the concept of joyful, communal activity. All children’s play is referred to as massana (Mbenjele: Lewis 2002) or motoko (Aka: Boyette 2013), but adults may also be said to be “taking massana” during ritual dance performance, for example (Lewis 2002). Additionally, in the forager culturally constructed niche, there is not the same distinction between work and play that exists in the west. However, for the purposes of comparability to studies of children’s play in the West or others using ethology and developmental psychology methods, I will restrict my discussion in this chapter to children’s play only and will refer to “play” in opposition to “work,” acknowledging that this is an etic distinction, not an emic one. I also will not discuss music and dance, although these are culturally significant forms of play to foragers, because they are not included in other studies I draw from.

There are few systematic studies of forager children’s play (Bock and Johnson 2004; Boyette 2016; Gosso et al. 2005; Kamei 2005), but these have demonstrated that the same types of play exist among forager children that have been observed across other groups (e.g., farmers, pastoralists, industrialists), suggesting that any benefits to learning through play are universal. However, the forager culturally constructed niche influences the nature and frequency of play (Hewlett and Boyette 2012), as well as the source of imitated content that is performed in play (Hewlett et al. 2011).
13.3.1 Vertical/Oblique Social Learning

For example, the degree to which children have access to adult activities is likely to influence the relative frequency that they imitate adult life in their play. In middle-class Western society, where most subjects of play research are drawn, children have little opportunity to observe adults working (Morelli et al. 2003). In small-scale societies, adult activities are readily observable and children act as legitimate peripheral participants in work (Paradise and Rogoff 2009; Rogoff et al. 1975). Forager children are granted more autonomy in their activities than are children of other small-scale societies and, depending on the safety of the natural ecology (Blurton Jones et al. 1994), can be economically active both independently and alongside adults. Recently, Boyette (2016) showed that Aka children’s play was more often an imitation of adult subsistence work than was Ngandu farmer children’s play, even though Ngandu children played overall more frequently, suggesting a greater interest in imitation of adult economic activities among children in one forager group.

13.3.2 Horizontal Social Learning

While they may be in close contact during work or leisure, forager adults do not play with children after infancy (except in the context of communal dances, as noted above), and during early childhood, children transition from their mother and other adults as primary caretakers to a multiage group of children who play and, where feasible, legitimately forage together (Konner 1972, 2005). Little is known about the influence of forager peer groups on children’s learning. However, insights can be gleaned from the types of play typically engaged in by forager children when they are not imitating adult activities (i.e., when horizontal transmission may be more important) that suggest forager children’s play in peer groups reinforces the cultural values of autonomy, cooperation, and egalitarianism. For example, early comparative analyses of children’s play indicate foragers do not tend to play strategy games, which require rules and a competitive objective and are cross-culturally associated with political integration and social stratification (Roberts et al. 1959) and with training for obedience (Roberts and Sutton-Smith 1962).

The cultural values of prestige avoidance, nonaggression, and autonomy may motivate forager children’s choice of play activities toward those that de-emphasize social ranking or dominance. For example, Aka forager children play rough-and-tumble play and competitive games significantly less frequently than do Ngandu farmer children for whom social competition and status striving are culturally valued. Instead, Aka children’s play is predominately oriented around imitation of adult subsistence work or exploration of their forest surroundings (Boyette 2016). Similarly, Mbenjele games do not involve competition and have no winners or losers (Lewis 2002). Based on his observations, Lewis believes Mbenjele children’s play “accords with the Mbendjele’s implicit egalitarian ethic that values the equal worth of all and the synergistically increasing pleasure of cooperative activity” (2002, p. 131).

13.3.3 Individual Learning: Creativity

The capacity for innovation is central to human cumulative culture, and the nature of play has suggested to some that there is a relationship between play and innovation. However, cultural views on creativity and innovation are also likely to influence what types of play children are motivated to engage in and what is learned during play. In middle-class Western societies, adults take an active role in encouraging creativity and innovation in children’s play in order to encourage skills and ways of thinking conducive to academic achievement (Lancy 2008; Morelli et al. 2003). Creativity is valued by foragers as an expression of individual autonomy and is important in performance of songs, dances, stories, and body modification (Hewlett and Boyette 2012).

Pellegrini and Pellegrini (2012) believe innovation in play was essential to humans in adapting to new environments throughout our evolutionary history, which would suggest it should be highly valued. However, Hewlett and Boyette (2012) note that there is no evidence that forager children produce innovations later adopted by adults for subsistence or other purposes. Most innovations introduced in forager cultures tend to come from young adults (Hewlett 2013). Moreover, time spent in creative play (emphasizing individual learning) is necessarily limited by time spent in imitation of adults or of peers (emphasizing social learning), and ethnographic work tends to indicate foragers hold a view of play as practice of socially learned behavior. For example, an Aka informant told Hewlett (2013): “Children play in order to know how to live. Children play to know how their parents do things” (p. 67). How important creative play is for its own sake among foragers remains an empirical question.

It is important to note that the terms “individual” and “asocial” with regard to learning are meant to draw attention to the unconventional nature of the behavior. I do not mean that what I refer to as “creative play” is performed in the absence of others. Indeed, collaboration may be a key to human creativity and has led to our distinct cultural innovations (Tomasello et al. 1993).

To summarize, the forager culturally constructed niche (1) permits extensive access to the adult world and promotes vertical and oblique social learning; (2) discourages competitive games and rough-and-tumble play, thereby promoting noncompetitive play within multiage groups; and (3) supports creativity in play to the extent that it flows from children’s autonomy. In what follows I analyze a small sample of systematic, quantitative data on children’s play to test
whether forager children’s play commonly represents a greater preference for vertical or oblique social learning than that of non-foragers and conversely whether non-forager children’s play represents a greater preference for horizontal social learning than forager children’s play. I then compare the contexts of Aka forager and Ngandu farmer play to explore the role of collaborative learning in cultural transmission and innovation as represented in children’s play.

13.4 Methods

13.4.1 Field Site and Data

Data for my analysis comes from my own fieldwork in the Central African Republic with Aka forest foragers and Ngandu farmers during a 6-month period in 2010 (Boyette 2013) and from three other published studies with comparable systematic, quantitative data on children’s autonomous play across middle childhood, the period roughly between the ages of 6 and 12 years (Bogin 1990).

My own work was done in the village of Bagandou and in the forests south of the village. I collected time-budget data from children using focal-child follows. Fifty Aka children (52 % female) and 48 Ngandu children (50 % female) aged 4–16 \( (M = 9.3, \ SD = 3.8) \) participated. Each child was observed for a mean of 3.9 h (SD = 0.94) over a series of days. Children were each assigned one morning, midday, and afternoon observation period using a table of random numbers. Children’s activities were coded every minute using interval coding for 45 min during the focal follows according to a predetermined behavior-coding rubric. Additionally, the identity of all individuals within 3 m of distance to the child (touching, within 3 m, within 6 m) was recorded every 5 min. If I did not know an individual’s identity, their age category and sex were recorded. I later followed up on unknown individuals to establish their relationship to the focal child whenever possible. It was also noted whether adults were in visual range of the children, as a measure of autonomy afforded children by adults.

The Aka children in my sample came from communities ranging from 25 to 55 regularly present members \( (M = 40.4, \ SD = 10.5) \). All but one camp, the largest, was located at least 2 h walk into the forest from Bagandou. The large “village” camp was located 15-min walk along the main road from the center of Bagandou but did not otherwise differ from the forest camps in relation to children’s play. The Ngandu participants were drawn from three clan-based neighborhoods of the village. Each neighborhood is home to roughly 400 people, most of whom could trace their ancestry back to a common patrilineal ancestor.

To enrich the comparison between the Aka and Ngandu across development, I compiled data from three previously published systematic studies of children’s play. Kamei (2005) observed Baka children of the same age range as the Aka and Ngandu that I observed. The Baka are a mixed subsistence, “post-forager” population living in the tropical forests of Cameroon and, while relatively sedentary compared to the Aka, still practice forest foraging activities to varying degrees. They also share a deep history with the Aka and remain culturally similar in that they value sharing, autonomy, and egalitarianism. Gosso and colleagues (2005) observed Parakanã Indian children ages 4–6 and 7–12 years old. The Parakanã are small-scale society of northern Brazil, whose culture “strongly resembles pre-Columbian Brazilian Indians” (p. 215). They practice small-scale subsistence agriculture, though hunting and gathering are regular and important subsistence activities. Parakanã children are free to move about their villages and adults do not interfere with children’s activities, as is typical of foragers. Lastly, Blatchford and colleagues (2003) observed English junior school students age 7–8 years old in four schools. These children were observed on the playground during recesses held between two and three times a day, lasting from 15 min to an hour. Two to three adults were always present on the playground. While only children aged 7–8 years old were observed, they were able to play with children of different ages on the playground.

For my analysis of pathways of culture learning, I have regrouped the authors’ categories of play by whether they represented vertical or horizontal social learning or individual learning. From my own observations and those described in other publications from which data was drawn, children’s pretense or fantasy play tended to involve imitation of adult activities or roles and therefore is considered to represent vertical social learning. For the English, some examples were derived from media such as television (e.g., “Jerry Springer,” “Pokémon”), which I consider analogous to Aka children adorning the costume of \( \text{Dzengi} \), the forest spirit, outside of public dance contexts, for example. The English children, coming from a complex society with extensive role specialization, also played roles not every child will eventually have the chance to perform (e.g., “cops and robbers”). However, performing a generalized imitation of a specialized role in play is not uncommon among societies even with very little role specialization (e.g., blacksmith; Lancy 1980), so this was considered a reasonable comparison to other groups. Similarly, Kamei’s category “play related to modern things” including pretending to drive a motorcycle, which most Baka children would not have the opportunity to do as adults. For the Parakanã, I placed Gosso and colleagues’ category of “construction play” under vertical social learning as they list weaving, house building, and digging as examples of construction play, all of which resemble adult activities.

Games, while also played by adults in some cultural contexts, are important contexts for learning and building social norms with other children (Piaget 1932). The rules of how to play specific games are passed between children, but play itself may even become secondary to learning the rules...
of cooperation and competition that are negotiated collaboratively and autonomously within children’s groups (Lancy 2008). As such, game play was taken to represent horizontal social learning and all authors had a very similar category for games. I originally coded the traditional Aka games of ndanga, play on the ezambi liana swing, and chase or hiding games separately from other games as they are noncompetitive, but have placed them together here because they are organized among children.

Finally, other play activities reported by each author seemed to be relatively less conventional, therefore affording opportunities for creativity. These activities are considered as representing individual learning. Table 13.1 presents how I mapped the original categories reported by each author on to the theoretical framework used here. I excluded Kamei’s “songs, dances, and music” and my own analogous category because these were not included in the other studies.

13.5 Results

13.5.1 Play as Culture Learning in Comparative Perspective

Figure 13.1 presents the mean percentages of children’s time spent in play across the societies included in the sample. It was predicted that play representing vertical or oblique social learning would be more frequent among foragers, and play representing horizontal social learning would be more frequent among non-foragers. The only statistically significant difference between the foragers, Aka, Baka, and Parakanã, and the non-foragers, Ngandu and English, was the greater percentage of observations Ngandu and English children played games. In both groups, about 31 % of children’s play consisted of games, whereas 15 % was the highest proportion of play involving games among the foragers. This result indicates a preference for play that emphasizes horizontal transmission among the two cultures with an agrarian subsistence base and hierarchical social structure.

For the other two types of play, there was not a significant difference between foragers and non-foragers. There was a greater mean percent of pretense play among the foragers as a whole, although this was due to the higher figure for the Baka. Kamei (2005) did not provide complete totals for individual children or subpopulations, such as age or sex categories, so no mean was calculated and only a percentage of all episodes was used. That aside, he described an extraordinary variety of subsistence work-themed pretense among the Baka.

Creative play constituted the largest mean percentage of play for foragers and non-foragers (50 % and 43 %, respectively). The Aka and Ngandu are noticeable outliers in this category; however, this is likely attributable to the greater variety of activities I recorded as play among these groups and the detailed account of their lives possible through focal follow methodology.

Table 13.1 Categories of play used in the analysis by culture learning pathway that each represents

<table>
<thead>
<tr>
<th>Play subcategories</th>
<th>Aka</th>
<th>Baka</th>
<th>Parakanã</th>
<th>Ngandu</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical/oblique</td>
<td>“Work” pretense (e.g., gather, net hunt, spear hunt, food preparation)</td>
<td>Foraging</td>
<td>Fantasy play (e.g., “using a stick as a canoe, simulating domestic scenes, playing roles such as shaman”)</td>
<td>“Work” pretense (e.g., gather, snare, food preparation, commerce)</td>
<td>Fantasy play (e.g., “mums and dads, families, cops and robbers, “Jerry Springer,” “Pokémon,” etc.”)</td>
</tr>
<tr>
<td>Pretense</td>
<td>Modern things</td>
<td></td>
<td></td>
<td>Pretense</td>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
<td>Ndanga</td>
<td>Competitive games</td>
<td>Games with rules (e.g., ball games, throwing games, dice)</td>
<td>Ball or ruled games (e.g., soccer, babie, “jacks,” “hopscotch,” other strategy)</td>
<td>Games (e.g., chasing, racing, ball games, jump skipping, games with materials, verbal games)</td>
</tr>
<tr>
<td>Other ball or ruled games (e.g., soccer)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chase/hide</td>
<td>Ezambi (swing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative</td>
<td>Object play (not play work or pretend)</td>
<td>Body/physical exercise</td>
<td>Exercise play</td>
<td>Object play (not play work or pretend)</td>
<td>Vigorous play</td>
</tr>
<tr>
<td>Rough and tumble</td>
<td>Others</td>
<td></td>
<td>Rough and tumble</td>
<td></td>
<td>Sedentary play (“e.g., drawing, reading, playing with cars”)</td>
</tr>
<tr>
<td>Explore/roam</td>
<td></td>
<td></td>
<td>Explore/roam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intimate physical play</td>
<td></td>
<td></td>
<td>Intimate physical play</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree climb</td>
<td></td>
<td></td>
<td>Tree climb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td>Others</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

aBoyette (2013)
bKamei (2005, p. 348–349); much more detail of play forms described therein
cGosso et al. (2005, p. 222)
dBlatchford et al. (2003, p. 488–489)
### 13.5.2 Children’s Autonomy and Collaboration During Culture Learning

Data from Aka foragers and Ngandu farmers was used to explore the social context of culture learning during children’s play. For both groups, play was a consistently social activity without involvement from adults. While a proportion of the children’s play would have been regarded by psychologists as “solitary” or “parallel” rather than “social” (Smith 1978), movement of children in and out of interaction during play was typically rapid at the ages studied here, and social companions were normally close by. For example, on average, focal children were within 5 m of around three other children ages 4–17 years across all observations (Table 13.2). At the same time, while adults were often within visual range of children during their play (70% of observations among the Aka, 86% of observations among the Ngandu), there were an average of 0.7 adults within 5 m of Aka focal children during play and an average of 0.4 adults within 5 m of Ngandu children (Table 13.2).

![Fig. 13.1](image)

#### Table 13.2 Mean (SD) number of social companions within 5 m of children during play

<table>
<thead>
<tr>
<th>Number of companions</th>
<th>Pretense (vertical/oblique)</th>
<th>Games (horizontal)</th>
<th>Creative play</th>
<th>All play</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aka</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td>2.8 (2.5)</td>
<td>3.2 (2.3)</td>
<td>2.4 (2.1)</td>
<td>2.6 (2.2)</td>
</tr>
<tr>
<td>Adults</td>
<td>0.4 (0.9)</td>
<td>0.8 (1.3)</td>
<td>0.8 (1.2)</td>
<td>0.7 (1.1)</td>
</tr>
<tr>
<td>Ngandu</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td>2.7 (2.4)</td>
<td>4.3 (2.9)</td>
<td>2.8 (2.4)</td>
<td>3.3 (2.7)</td>
</tr>
<tr>
<td>Adults</td>
<td>0.4 (0.9)</td>
<td>0.2 (0.5)</td>
<td>0.5 (0.9)</td>
<td>0.4 (0.8)</td>
</tr>
</tbody>
</table>

Play was largely confined to the domestic centers of the Aka and Ngandu communities (Table 13.3). For the Aka, the camp, or *lango*, typically consists of houses organized centripetally around a clearing. Children are not prohibited from any area of camp, and about 78% of all play occurred within the *lango*. Though the difference was not large, a greater percentage of games and creative play than pretense play occurred in the *lango*. Similarly, the majority of play for the Ngandu occurred within or adjacent to one or another patrilineal family concession—a set of houses oriented around a...
courtyard. Ngandu neighborhoods were founded by families sharing a patrilineal clan relationship, and most families in a neighborhood can trace their ancestry to a distant common ancestor. Children in the neighborhood tend to be familiar with each other if not close family and come and go freely from other families’ concessions. However, whereas only 5% of all Ngandu children’s play was outside of family concessions, about 20% of Aka children’s play was in the forest, ndima, away from the lango.

Table 13.3 Percent of play representing each culture learning pathway by setting

<table>
<thead>
<tr>
<th>Setting</th>
<th>Vertical/oblique</th>
<th>Horizontal</th>
<th>Creative</th>
<th>All play</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aka</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aka forest camp</td>
<td>71.2</td>
<td>83.7</td>
<td>78.5</td>
<td>77.7</td>
</tr>
<tr>
<td>Forest</td>
<td>21.7</td>
<td>16.3</td>
<td>19.9</td>
<td>19.7</td>
</tr>
<tr>
<td>Ngandu concession</td>
<td>–</td>
<td>–</td>
<td>0.8</td>
<td>0.5</td>
</tr>
<tr>
<td>Village</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Village garden</td>
<td>7.1</td>
<td>–</td>
<td>0.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Ngandu</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aka forest camp</td>
<td>–</td>
<td>–</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Forest</td>
<td>3.3</td>
<td>–</td>
<td>1.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Ngandu concession</td>
<td>93.8</td>
<td>97.2</td>
<td>93.8</td>
<td>95.0</td>
</tr>
<tr>
<td>Village</td>
<td>–</td>
<td>2.3</td>
<td>2.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Village garden</td>
<td>2.9</td>
<td>0.5</td>
<td>1.7</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Further exploring Aka children’s play in the forest reveals insights into the autonomous and collaborative nature of vertical cultural transmission at the proximate level. Whereas at least one adult was nearly always present in the lango when children played (82% of observations), 70% of all ndima play was done out of the sight of an adult (Table 13.4). Similarly, 78% of play involving the imitation of traditional subsistence labor, or “work” pretense, was away from any adults, as was 75% of other pretense play. When adults were nearby (within 5 m) while children played, they were more likely to be relatively close (within 2 m). Of course, I was always present, as was my Ngandu field assistant on occasion, but we were not counted in these measurements. We would have been completely lost without the children and cannot be considered a relevant adult presence in regard to children’s learning.

Table 13.4 Aka children’s proximity to adults while playing in the forest

<table>
<thead>
<tr>
<th>Proximity of one or more adults to focal child</th>
<th>All play %</th>
<th>“Work” pretense %</th>
<th>Other pretense %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 2 m</td>
<td>12</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Within 5 m</td>
<td>6</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Greater than 5 m</td>
<td>12</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>No adults in visual range</td>
<td>70</td>
<td>78</td>
<td>75</td>
</tr>
</tbody>
</table>

13.6 Discussion

In this chapter I have argued that autonomous play, such as the Aka boys’ honey gathering described in the introduction, reveals children’s evolutionarily informed culture learning goals and that variation in frequencies of play with content from different sources—such as from older, rather than other children—can represent evidence for adaptive cultural transmission within a specific culturally constructed niche. While my comparative analysis did not support a relatively greater degree of vertical or oblique cultural transmission among foragers as was hypothesized, clear support was found for the hypothesized association between social stratification and horizontal cultural transmission as represented by game play. Furthermore, an unexpectedly high percentage of play across cultures represented spontaneous, creative play, which may be significant to our understanding of the role of play in cultural evolution.

In addition, the analysis of children’s play in the Aka forager and Ngandu farmer cultural niches problematizes the idea that vertical and oblique transmission is in practice the movement of information from older to younger individuals. Rather, among the Aka, children’s imitation of traditional activities in play often occurs away from adults. How these results integrate with previous studies of cultural transmission is now discussed.

13.6.1 How “Vertical” Is Cultural Transmission Among Foragers Versus Others?

Several studies using self-report and knowledge correlation methods have found vertical and oblique transmission to be the sources of a variety of adult’s skills, beliefs, values, and types of knowledge among a range of small-scale societies (Aunger 2002; Demps et al. 2012; Hattori n.d.; Henrich and Henrich 2010; Ohmagari and Berkes 1997; Reyes-Garcia et al. 2009; Tehrani and Collard 2009). Among the Aka, Hewlett and Cavalli-Sforza (1986) found that adults and children in middle childhood and adolescence reported learning most traditional skills through vertical transmission. I replicated their findings in a series of interviews about food sharing with children in middle childhood but found that the children would mention other specific adults beyond their parents if asked who else contributed to their knowledge (Boyette 2013).

These studies implicate vertical and oblique cultural transmission modes as important to foragers and other small-scale societies. However, as noted above, the problem with these methodologies for studying cultural transmission is that neither captures the proximate social learning processes that children experience as part of habitus—lived experiences internalized during everyday practice (Bourdieu...
Play is part of children’s practice and how habitus is developed within particular culturally constructed niches. If we accept the premise that play represents children’s autonomous (evolved, not necessarily conscious) preferences for learning cultural roles, values, routines, and meanings through imitative performance, then the current study suggests, first, that foragers are not much more motivated to imitate older children and adults than they are to negotiate and conform to peer-established norms in games; and, second, they are not significantly more motivated to play pretense than are small-scale farmer or middle-class industrialist school children. The lack of a difference in play representing vertical/oblique or horizontal social learning among foragers may suggest that the forager culturally constructed niche is at an evolutionary equilibrium as far as the advantages of social learning from older versus same-age individuals (Henrich and Broesch 2011). From a more proximate perspective, the foundational forager value of egalitarianism might discourage children valuing adult versus child sources of knowledge differently (Lewis 2009), while also encouraging widespread sharing of information.

However, the farmer and industrialist children are far more likely to play games, which suggests a preference for learning from peers or horizontal social learning. A preference for horizontal social learning among non-foragers supports previous cross-cultural research finding an association between games—as conventional (i.e., rule-governed), child-organized activities—and social stratification (Roberts et al. 1959; Roberts and Sutton-Smith 1962). According to cultural transmission theory, horizontal transmission is adaptive in relatively unstable environments (Boyd and Richerson 1985; Cavalli-Sforza and Feldman 1981). “Unstable,” in this sense, means that what can be learned from older generations is less relevant than what can be learned from those relatively closer in age. In socially stratified societies, what is relevant in order to learn in order to succeed is how to compete socially. Thus, one explanation for the prominence of games among socially stratified societies is that children are motivated to learn skills in competition from their peers—those they will later be competing with and against.

No previous studies of cultural transmission have attempted to measure the difference in frequency of social versus individual learning. The results here indicate that individual learning, represented by nonconventional, creative play, is relatively prominent in forager and agrarian societies, ranging from about a quarter (English) to about two-thirds (Aka) of children’s play. These results support the contention that innovation—the result of creativity—emerging from children’s play may have an important role in human evolution (Pellegrini and Pellegrini 2012). It may be that children’s play serves a more general learning function or, as is likely, a multitude of learning functions serving the individual over the lifetime, including by training physical, cognitive, and cultural flexibility. However, it is noteworthy that creative play as I defined it here included the original authors’ categories of “rough-and-tumble,” “physical,” or “vigorous” play, all of which were generally described as spontaneous physical activity and have been argued to be important for neuromuscular and cognitive development (Byers and Walker 1995; Pellegrini and Smith 1998a). Rather than leading to innovation, such physical play might simply lead to better abilities to adapt physically and cognitively later in life. It remains an empirical question as to whether other nonconventional behaviors typical of creative play have led to innovations transmitted across generations (Hewlett and Boyette 2012).

One major weakness of comparing behavioral data like these is that authors tend to categorize play in ways based on their theoretical interests or field site. For example, I found that exploration of the camp and forest ecology was a playful activity common to Aka children, as well as an occasional aspect of Ngandu play, whereas such “roaming” has not been recorded as play by other authors (Boyette n.d.). Additionally, I uniquely recorded object play in my sample, although this activity may be analogous to some of Blatchford and colleague’s “sedentary play.” Such variation in coding likely accounts for some of the differences between groups. However, it was the most consistently defined category of play—games—where the only statistically significant difference emerged, supporting the hypothesis that children in cultures with hierarchical social structures prefer to learn through performance in play the norms of cooperation and competition of their peers.

### 13.6.2 Culture Learning in the Forager Niche

The Aka have a unique culture and history, but the commonalities across mobile, immediate-return forager cultures in emphasis on individual autonomy, egalitarianism, and sharing, and their societies’ unique relationship with the environment permit some generalization (Bird-David 1990; Lee and Daly 1999). In particular, the contexts of learning fostered by the Aka culturally constructed niche as compared with that of their Ngandu farmer neighbors illuminate the relationship between autonomy, intimacy with the environment, and forager children’s collaborative learning.

The Aka and Ngandu live, work, and play in two distinct culturally constructed niches. Adults and children in both groups pass through the others’ spaces on a daily basis, but the physical and cultural separation which locally distinguishes “the forest” from “the village” endows each with contrasting meanings for the two groups (e.g., Bahuchet and Guillaume 1982; Hewlett 1991). For example, both the Aka and Ngandu may frequently utilize the forest, but the Aka see it as a safe and giving environment, whereas the Ngandu tend to regard it as a dangerous place inhabited by
vengeful spirits. Accordingly, Aka forager children’s play was distinct from that of the Ngandu children in the degree to which they played away from the domestic centers of their communities. Aka children spent one-fifth of their time playing in the forest, and three-quarters of this time was spent without adult presence, including pretense of traditional subsistence activities. Therefore, other children were central to any learning—and cultural transmission—that occurred during this play.

Ngandu children play more frequently than do Aka children and have a great deal of autonomy. Their play is comparatively dominated by games, suggesting a stronger interest in learning cooperative and competitive norms and skills from other children. However, the lack of privacy, dense sociality, and value for obedience and hierarchy that characterize the Ngandu culturally constructed niche mean that play can always be interrupted by obligations to older family members—especially during middle childhood when work responsibilities increase.

References

Hattori S (n.d.) “My medicine (ma a le’):” variability of medicinal plant knowledge among adult Baka hunter-gatherers of Southeast Cameroon. Unpublished Report
Lancy DF (2012) Ethnographic perspectives on cultural transmission/acquisition. Paper prepared for the School of American Research,
Santa Fe, Advanced Seminar: Multiple perspectives on the evolution of childhood


