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Patron: Gray, Peter

Journal Title: Evolution, early experience and human development ; from research to practice and policy /

Volume: Issue:
Month: Year: 2012
Pages: 352-370

Article Author: Peter Gray
Article Title: The value of a play-filled childhood in development of the hunter-gatherer individual.

Imprint: Oxford ; New York ; Oxford University Pr

ILL Number: 105719359



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The Value of a Play-Filled Childhood in Development of the Hunter-Gatherer Individual

Peter Gray

Children come into the world with drives and behavioral dispositions that are designed, by natural selection, to promote their development toward adulthood. Prominent among these is the drive to play. My aim here is to shed light on children's powerful drive to play by examining its manifestation in hunter-gatherer children. The human play drive, like all of our biological traits, was shaped from its earlier primate form during the hundreds of thousands of years when we were all hunter-gatherers. Therefore, an examination of the play of hunter-gatherer children may help us understand better play's natural forms and functions and lead to a better understanding of its continuing role in children's development today.

The pure hunting-and-gathering way of life is now nearly extinct, but as recently as 30 years ago, and to some extent even more recently, researchers could find and study hunter-gatherers, in various remote parts of the world, who had been almost untouched by modern ways. On the basis of such studies, anthropologists generally distinguish between two categories of hunter-gatherer societies (Kelly, 1995). One category, referred to as *delayed-return* or *nonegalitarian* hunter-gatherers, or as *collector societies*, are those who lived in fixed locations and exploited a rich local supply of food, commonly fish. They are characterized by food storage, relatively high population densities, resource ownership, hierarchical social structures, inherited status, and relatively high rates of violence and acceptance of violence as legitimate. Examples are the Kwakiutl of the American northwest coast and the Ainu of Japan. The other category, which is the one relevant to this paper, is that referred to as *immediate-return* or *egalitarian* hunter-gatherers, or as *band societies*.

Hunter-gatherers in this category live in small groups (bands) of roughly 30 to 50 persons each, including children, that move from place to place within a large but circumscribed area to follow the available game and vegetation. Wherever they are found, they have a highly egalitarian social structure, make decisions by consensus, own little property, share food and material goods within and even across bands, do not have means of long-term food preservation, have little occupational specialization except that based on gender, and generally reject violence as a legitimate way of solving problems. Archeological evidence suggests

that band societies are more ancient than are collector societies and more likely to represent the living conditions of our preagricultural ancestors (Kelly, 1995). My focus in this chapter is exclusively on band societies, and when I use the term *hunter-gatherers*, unmodified, I am referring to band hunter-gatherers. Among the many band societies that were extensively studied in the last half of the 20th century are the *Jul'hoansi* (also called the *!Kung*, of Africa's Kalahari Desert), *Hazda* (of Tanzanian rainforests), *Mbuti* (of Congo's Ituri Forest), *Aka* (of rainforests in the Central African Republic and Congo), *Efé* (of Congo's Ituri Forest), *Batek* (of peninsular Malaysia), *Agta* (of Luzon, Philippines), *Nayaka* (of South India), *Aché* (of Eastern Paraguay), *Parakana* (of Brazil's Amazon Basin), and *Yiwara* (of the Australian Desert).

Findings from research into such societies have provided a challenge to scientists who are interested in human social nature. Whether we compare them to our great ape relatives or to humans living in agricultural or industrial societies, hunter-gatherers come across as far more egalitarian and altruistic than do members of other societies. The three African great apes to which we are most closely related—chimpanzees, bonobos, and gorillas—all live in groups in which high-ranking individuals regularly dominate and bully lower ranking ones and where battles for status are common (Boehm, 1999). All or at least most post-hunter-gatherer human societies seem, in various ways, to reflect the hierarchical structure of our ape heritage; those who are higher up exert power over those who are lower down, and large individual differences in wealth and privilege are tolerated and expected. And yet, perhaps for hundreds of thousands of years, human beings in hunter-gatherer societies lived in groups without dominant leaders, with what has been described as a “fiercely egalitarian” ethos (Lee, 1988), by means that ensured the equal distribution of food and material wealth among all band members.

How did hunter-gatherers maintain their egalitarian style of life? Christopher Boehm (1999) has proposed a quite convincing answer to that question. He contends that hunter-gatherer egalitarianism did not fall passively out of human nature, but was vigilantly maintained and enforced through social practices that he calls “reverse dominance.” These practices included the condemnation and punishment of any individuals who displayed even incipient signs of domination, selfishness, or arrogance. In a standard dominance hierarchy, powerful individuals at the top control the rank and file; but in the hunter-gatherers' reverse hierarchy, according to Boehm, the rank and file collectively controlled anyone who might try to dominate others. The control was aimed specifically at deflating the potentially dominating person's ego, and it commonly involved ridicule or, in more extreme cases, shunning, which would stop only when the offending person expressed appropriate humility and ended the offensive behavior. The human hunting-and-gathering way of life apparently required an extraordinary degree of cooperation and sharing, far more than that exhibited by any of the great apes and more than that required for agricultural and postagricultural modes of human existence. According to Boehm, hunter-gatherer groups everywhere, perhaps independently in different parts of the

world, invented the procedures of reverse dominance to achieve and maintain the egalitarian ethos that underlay their cooperation and sharing.

A Play Theory of Hunter-Gatherer Equality

Elsewhere I have proposed and elaborated upon a different theory—a *play* theory—to explain how hunter-gatherers maintained their egalitarian style of life (Gray, 2009). I see this theory as a supplement, not necessarily an alternative, to Boehm's reverse-dominance theory. I think both are true. My theory, simply put, is that hunter-gatherers maintained their egalitarian ethos by cultivating the playful side of their human nature.

Social play—play involving two or more playmates—is necessarily egalitarian. It always requires a suspension of aggression and dominance and heightened sensitivity to the needs and desires of the other individuals involved. Players may recognize that one playmate is better at the played activity than are others, but that recognition must not lead the one who is better to dominate the others. This is true for play among animals as well as for that among humans (Bekoff & Byers, 1998). For example, when two young monkeys of different size and strength engage in a play fight, the stronger one deliberately self-handicaps, avoids actions that would frighten or hurt the playmate, and sends repeated play signals that are understood as signs of nonaggression (Biben, 1998). That is what makes the activity a *play* fight instead of a real fight. If the stronger animal failed to behave in these ways, the weaker one would feel threatened and flee, and the play would end. The drive to play, therefore, requires suppression of the drive to dominate. My theory, then, is that hunter-gatherers suppressed the tendency to dominate and promoted egalitarian sharing and cooperation by deliberately fostering a playful attitude in essentially all of their social activities. The capacity for play, which we inherited from our mammalian ancestors, is the capacity that best counters the tendency to dominate, which we also inherited from our mammalian ancestors.

My play theory of hunter-gather equality is based largely on evidence, gleaned from analysis of the anthropological literature, that play permeated the social lives of adults in hunter-gatherer cultures—more so than is the case for any known, long-lasting post-hunter-gatherer cultures. Their hunting and gathering were playful; their religious beliefs and practices were playful; their practices of dividing meat and of sharing goods outside of the band as well as inside of the band were playful; and even their most common methods of punishing offenders within their group (through humor and ridicule) had a playful element (Gray, 2009).

In the remainder of this chapter, however, my focus is on the play of hunter-gatherer children, not adults. I will describe the conditions in which hunter-gatherer children played, the ways in which they played, and the means by which their play enabled them to acquire the skills, attitudes, and character traits essential to successful hunter-gatherer adulthood. I am concerned here with the development of

the complete hunter-gatherer adult, but especially with the development of those traits that underlay hunter-gatherer egalitarianism. The data come primarily from the anthropological literature on children's lives in hunter-gatherer cultures and secondarily from a small survey that Jonathan Ogas and I conducted of anthropologists who had lived in and observed hunter-gatherer groups (described in Gray, 2009). For the survey, we asked researchers to fill out a written questionnaire pertaining to children's lives, especially their play, in the culture they observed. Ten different anthropologists completed and returned the questionnaire. Among them, they had studied seven different hunter-gatherer band societies (four in Africa, two in Asia, and one in New Guinea).

Before turning to the play of hunter-gatherer children, it would be worthwhile to consider the defining characteristics of human play. As form and function are related, the characteristics of play provide strong clues to play's developmental functions.

Defining Characteristics of Play

Like most categories of behavioral or psychological phenomena, *play* is a category with blurred edges. At least in our species, play can exist in matters of degree. We might speak of some activities as *full play* and of others as to varying degrees *playful*, depending on the degree to which they contain all of play's characteristics.

Play involves a convergence of characteristics, all of which have to do with the motives or mental framework underlying the observed behavior. Play scholars have used a wide variety of terms to describe or define their subject, but I think all of them can be boiled down quite well to the following five (Gray, 2009): Play is activity that (1) is self-chosen and self-directed; (2) is intrinsically motivated; (3) is guided by mental rules; (4) is imaginative; and (5) involves an active, alert, but nonstressed frame of mind. The more fully an activity entails all of these characteristics, the more inclined most people are to refer to it as play.

PLAY IS SELF-CHOSEN AND SELF-DIRECTED

Play, first and foremost, is what a person *wants* to do, not what a person feels compelled to do. Players choose what to play and how. Any activity motivated by coercion rather than choice is not play. In social play, players must decide together what and how to play, and they must do so in such a way that nobody feels coerced. Thus, social play provides continuous practice in the art of consensual decision making and getting along with others as equals.

The most basic freedom in play is the freedom to quit. Players know that playmates who feel coerced or in other ways dissatisfied will quit, and if too many quit the game ends. To keep the game going, players must satisfy not just their own desires but also those of the other players. The strong desire that children have to

play with other children, therefore, is a powerful force for them to learn how to attend to others' wishes and negotiate differences. Even preschool children exhibit such abilities in the context of play (Furth, 1996; Garvey, 1974).

PLAY IS INTRINSICALLY MOTIVATED

Play is activity that, from the conscious perspective of the player, is done for its own sake more than for any reward outside of itself. Stated differently, it is activity in which means are more valued than ends (Vygotsky, 1978b). When we are not playing, what we value most are the results of our actions, but when we are playing, it is the activity itself that pleases us. Play may be goal directed, but the goal is perceived as part and parcel of the activity, not as the primary reason for the activity. For example, in constructive play, the goal is to build some object that the players have in mind. But the pleasure derives primarily from *building* the object, not from *having* the object once it is built.

In our culture, many of the activities that we call "play" are competitive. Competition can turn "play" into nonplay if rewards for winning extend beyond the game itself. "Players" who are motivated primarily by trophies, praise, or increased status outside of the game are not fully playing. Among animals there is a clear distinction between *contests* (including ritualized battles of bluff as well as actual fights), which are aimed at achieving dominance, and *play*, in which strivings for dominance must be set aside (Bekoff & Byers, 1998). Our competitive games are best understood as blends of contest and play. The blend can veer more in one direction or the other, depending on the degree to which heightened out-of-game status or other extrinsic rewards are present for winning. In this regard, it is noteworthy that hunter-gatherers are the only known human cultural groups that, as a rule, did not play competitive games (Sutton-Smith & Roberts, 1970).

A number of researchers have observed that, even in our culture, children playing naturally, without adult direction or adult audiences, rarely care much about winning (Fine, 1986; Gray & Feldman, 2004). In pickup games of baseball or soccer, for example, they may cheer wildly when their team scores a point, but they pay little attention to the final score and often don't even bother to keep score. This is especially true if they are playing in age-mixed groups; and hunter-gatherer children and adolescents always played in widely age-mixed groups (Gray, 2009; Konner, 1975).

PLAY IS GUIDED BY MENTAL RULES

As Lev Vygotsky (1978b) emphasized in his now-classic essay on the role of play in children's development, all play has rules. Children freely choose to play, but in so choosing they put themselves into a situation in which they must follow rules, not behave impulsively. The rules are concepts held in the players' minds, which give form to the playful activity. In a play fight, for example, the rules prescribe that you

must mimic at least some of the motions of real fighting, but you must take pains not to really hurt the other person—no kicking, biting, scratching, or hitting hard, especially if you are the stronger of the two. In constructive play, a basic rule is that you must work with some chosen medium to produce or depict some specific object or design that you have in mind. In sociodramatic play, a basic rule is that each player must stay in character. If you are superman, you must not cry if you fall and hurt yourself; if you are the pet dog, you must walk around on all fours, no matter how uncomfortable it is to do so. Vygotsky contended that a major developmental function of play is to teach children how to inhibit their impulses and abide by socially agreed upon concepts of appropriate ways to act in particular situations, an ability that is important for all of adult life. Through play, children learn that inhibiting their impulses is not only necessary but is, ultimately, a source of pleasure.

PLAY IS IMAGINATIVE

Play, at least full play, always involves some degree of psychological removal of oneself from the immediate real world (Huizinga, 1955). Imagination, or fantasy, is most obvious in sociodramatic play, where the players create characters and a story line, but it is also present in other forms of play. In rough-and-tumble play, the fight is a pretend one, not a real one. In constructive play, the players know that they are building a pretend castle, not a real one. In formal games, such as chess, the players must accept the fictional world specified by the game. In the real world, bishops can move any way they choose, but in the fictional world of chess they can move only on the diagonals. The imaginative nature of play is, really, the flip side of play's rule-based nature (Vygotsky, 1978b). To the degree that play takes place in an imagined world, the players' actions must be governed by rules that are in the minds of the players rather than by laws of nature or impulsive instincts.

PLAY INVOLVES AN ACTIVE, ALERT, BUT RELATIVELY UNSTRESSED FRAME OF MIND

This final characteristic of play follows naturally from the others. Because play involves attention to means and to conscious mental rules, it requires an active, alert mind. However, because play is freely chosen rather than coerced, and because it is understood to take place in a fictitious world and to have ends that are inconsequential to real life, players are relatively free of psychological distress. Play is not always accompanied by smiles and laughter, and mental tension may arise as players strive to perform well; but, as play is always self-chosen, so is any mental tension that accompanies it. If the tension becomes too great, reaching the level of distress, the player is free to quit or to change the nature of the play at any time.

Much of the power of play for learning and creativity lies, paradoxically, in its apparent triviality. Because there is no out-of-game reward for success or punishment for failure, players are free to make mistakes, and therefore free to try out

new ways of doing things and new ways of thinking. A great deal of psychological research shows that people are much better at learning new skills and solving problems that require creativity if they are led to believe that their activities are not being evaluated, and will not affect them in any lasting way, than if they are led to believe the opposite (Amabile, 1996; Geen, 1991). The tension and narrow goal-directedness created by concern for evaluation or for other real-world consequences tend to channel thought and action down well-worn paths and prevent people from exploring new ones. People who are already highly skilled at an activity perform better when the performance counts than when it doesn't, but the opposite is true for novices. The playful state of mind, therefore, appears to be the ideal state for learning new skills and conceiving of new ideas.

The Cultural Context of Children's Play in Hunter-Gatherer Bands

The cultural context in which hunter-gatherer children played was one of extraordinary indulgence of children's wishes, unlimited freedom to play and explore with little or no adult interference, exposure to all aspects of the adult culture, and continuous age mixing. This context contributed to the developmental value of their play.

INDULGENCE OF CHILDREN'S WISHES

A term often used by researchers to describe adults' general treatment of children in hunter-gatherer cultures is "indulgence," but a better term might be "trusting." The spirit of egalitarianism and autonomy that pervaded hunter-gatherer social relationships applied to adults' interactions with children just as it applied to adults' interactions with one another. The central tenet of their parenting and educational philosophy seemed to be that children's instincts could be trusted, that children allowed to follow their own wills would learn what they needed to learn and would begin naturally to contribute to the band's economy when they had the skills and maturity to do so. To illustrate this attitude, here are three comments concerning adult hunter-gatherers' treatment of children, each from a different observer of a different culture:

- "Hunter-gatherers do not give orders to their children; for example, no adult announces bedtime. At night, children remain around adults until they feel tired and fall asleep. . . . Parakana adults do not interfere with their children's lives. They never beat, scold, or behave aggressively with them, physically or verbally, nor do they offer praise or keep track of their development." (Gosso, Otta, de Lima, Ribeiro, & Bussab, 2005, p. 218)
- "Ju/'hoan children very rarely cried, probably because they had little to cry about. No child was ever yelled at or slapped or physically punished, and few were even scolded." (Thomas, 2006, p. 198)

- “Infants and young children [among Inuit hunter-gatherers of the Hudson Bay area] are allowed to explore their environments to the limits of their physical capabilities and with minimal interference from adults. Thus if a child picks up a hazardous object, parents generally leave it to explore the dangers on its own. The child is presumed to know what it is doing.” (Guemple, 1988, p. 137)

From the perspective of a typical modern parent or educator, such indulgence might be expected to produce spoiled, unruly children, but apparently it does not, at least not within the context of hunter-gatherers' ways of life. Many researchers have commented on the cheerfulness and cooperativeness of hunter-gatherer children, and I have found no comments to the contrary. Here, for example, is what Elizabeth Marshall Thomas (2006, pp. 198–199) has to say about the Ju/'hoansi children she observed: “We are sometimes told that children who are treated so kindly become spoiled, but this is because those who hold that opinion have no idea how successful such measures can be. Free from frustration or anxiety, sunny and cooperative, ... the children were every parent's dream. No culture can ever have raised better, more intelligent, more likable, more confident children.”

UNLIMITED TIME AND FREEDOM TO PLAY

Given this indulgent attitude, it is not surprising that children in hunter-gatherer societies spent most of their time freely playing and exploring, on their own, without adult direction and little if any adult interference. The general belief among most hunter-gatherer adults, borne out by centuries of experience, was that children educated themselves through their self-directed play and exploration (Bakeman, Adamson, Konner, & Barr, 1990). To our question, “How much free time did children in the group you studied have for play?” all of the respondents in our survey said that the children were free to play all day or almost all day, every day, from the age of about 4 (when they were weaned and began to move away from their mothers) on into their teenage years, when they began taking on some adult responsibilities (Gray, 2009). An exception to the general rule of complete freedom for hunter-gatherer children has been reported for the Hazda, where children are expected to forage for much of their own food. However, even for this group, researchers found that the children spent only about 2 hours per day foraging, in the rich vegetation near camp, and continued to play even while foraging (Blurton Jones, Hawkes, & Draper, 1994).

In no post-hunter-gatherer cultures have children been found to have as much time and freedom to play as did those in hunter-gathers cultures. In fact, research on groups of people transitioning from hunting and gathering to farming has shown that the more a family is engaged in farming, and the less they are engaged in hunting and gathering, the less free time the children have for play (Bock & Johnson, 2004; Draper, 1988). In farming families, girls are required to help with childcare

and other domestic chores, and boys are required to work in the fields, beginning at a young age.

EXPOSURE TO ALL ASPECTS OF THE ADULT CULTURE

Although hunter-gatherer children usually played independently of adults, they were not segregated from adults. All of the adults in the band, most of whom were literally their aunts and uncles, cared for them and were ready to provide comfort and help when needed. All of the adults—with their different personalities, knowledge, skills, and foibles—were potential models to children of the kind of adult they might wish to become or avoid becoming. The children studied the adults and, in the privacy of their play, mimicked specific adults' actions and personalities, sometimes admiringly and sometimes mockingly (Turnbull, 1982). In our culture children may playfully mimic the heroes, villains, and fools that they see on television, but in hunter-gatherer cultures the models available to mimic were the real adults of their band, who represented the real ways of life toward which the children were moving.

Hunter-gatherer children could see first hand most adult activities, and those they didn't see they heard about as they listened to adult gossip, conversations, and stories. They were free to take part in all of the band's dances and ceremonies. They observed all activities that occurred in camp. They often accompanied their mothers on gathering trips. By the time they were young teenagers, boys were allowed to join men on some of their hunting expeditions. Thus, through observation and eager participation, they learned about the values, lore, and skills of their culture, and then they incorporated it all into their play.

Children not only observed adults using the culture's tools but also were allowed to play with those tools. In response to our question about toys that children played with in the bands that they observed, the respondents to our survey most often listed items that were either real or miniature versions of the tools used regularly by adults, such as bows and arrows, nets, knives, digging sticks, baskets, and mortars and pestles. Even very young children played with objects, such as sharp knives and burning sticks, that adults in our culture would deem too dangerous for children. Hunter-gatherer adults believed that children had sense enough not to hurt themselves with such objects and needed to play with them in order to become skilled at using them. There were some limits, however. The poison-tipped darts or arrows that adults used for hunting big game were kept well out of reach of young children (Thomas, 2006).

A number of hunter-gatherer researchers have commented that the children grew up in a play culture, of their own creation, which paralleled the larger culture within which it was embedded (Gosso et al., 2005; Shostak, 1981; Turnbull, 1961). In some cases the children would quite literally build a play village, of crude huts, a hundred or more yards away from the band's real encampment, which they would use as a base for acting out the full range of adult activities.

CONTINUOUS AGE MIXING AMONG CHILDREN AND ADOLESCENTS

Children and adolescents in hunter-gatherer bands played always in age-mixed groups. Even if the children had wanted to play only with age-mates, they would have been unable to. Because the bands were small and because births for any given mother were widely spaced (generally at least 4 years apart), few children would have found more than one or two other children within a year or 2 of their own age, and many would have found none (Konner, 1975). The typical hunter-gatherer playgroup might consist of half a dozen children ranging in age from 4 to 11 or from 8 to 15.

Age-mixed play offers unique learning opportunities beyond those present in same-age play (Gray, 2011b; Gray & Feldman, 2004). The most obvious advantage for the younger children is that it allows them to engage in and learn from activities that would be too dangerous or difficult for them to engage in alone or just with age-mates. To use Vygotsky's term, it allows them to play within their *zone of proximal development*, that is, at the realm of activities that are beyond their capacities to perform as individuals but within their capacities to perform in collaboration with more skilled others (Vygotsky, 1978a). In age-mixed play, older children provide natural supports, or "scaffolds," that literally or metaphorically raise the younger ones to higher levels. The scaffolds include physical boosts, hints, reminders, directions, and all sorts of help and instruction designed to keep the game going by moving the younger ones along. Such scaffolding occurs naturally and is seen whenever children of widely differing abilities play together at an activity that stretches the skills or knowledge of those who are less experienced.

But it is not just the younger children who benefit from age-mixed play. Older children consolidate their knowledge and expand on it through explaining concepts to younger ones. Even more important, older children exercise their nurturing instincts and gain a sense of themselves as mature and responsible through interactions with younger ones. The special educative power of age-mixed play lies in the asymmetry in knowledge and abilities coupled with play's general requirement that everyone's needs must be met (Gray, 2011b). To keep the game going, both the older and the younger ones must accommodate themselves to the needs of the others while still satisfying their own needs, and everyone learns in that process. That sort of ability to accommodate was particularly important to the hunter-gatherer way of life.

How Play Helped to Build the Hunter-Gatherer Person

Like children everywhere, hunter-gatherer children presumably played for the sake of play, with little conscious thought about its role in preparing them for adulthood. But inevitably they played at the kinds of activities, and in accordance with the kinds of attitudes and values, that prevailed in the adult culture that enveloped

them. And so, through play, they educated themselves. Through play, they practiced the subsistence and artistic skills, the social skills and values, and the personal character traits required for hunter-gatherer adulthood.

PLAY AND THE DEVELOPMENT OF HUNTER-GATHERER SUBSISTENCE AND ARTISTIC SKILLS

It would be a mistake to assume that, because hunter-gatherer cultures were “simpler” than ours, children in those cultures had less to learn than do children today. The hunting-and-gathering way of life was highly knowledge intensive and skill intensive; and, because of the relative absence of occupational specialization, each child had to acquire essentially the whole culture or at least that part of it appropriate to his or her gender.

To become hunters, boys had to learn how to identify and track the 200 to 300 different species of mammals and birds that the group might hunt, how to craft to perfection the tools of hunting, and how to use those tools with great skill. Louis Liebenberg (1990) has argued convincingly that the origins of scientific reasoning lay in hunter-gatherers’ animal tracking. Hunters combined the faint clues that they saw in sand, mud, or foliage with a vast store of knowledge, accumulated from their own experiences and from cultural transmission, to generate and test hypotheses about the size, sex, physical condition, speed of movement, and time of passage of the animal they were tracking (Wannenburgh, 1979). For example, they might infer that a certain antelope had passed by before a certain time of day by noticing that one of its footprints was overlain by the track of a kind of beetle that moves about only when the sun has reached a certain height in the sky (Thomas, 2006). Once a game animal was in sight, enormous skill was required to get close enough to it to shoot and hit it with a small poison-tipped arrow or dart. Researchers working in various hunter-gatherer societies found that hunting skills generally didn’t peak until a man was 35 to 45 years old, evidence of continued learning in adulthood (Bock, 2002; Kaplan, Hill, Lancaster, & Hurtado, 2000).

It is no surprise that boys growing up in a culture where hunting was so greatly valued, so much talked about, and known to be so difficult would play and explore in ways that helped them to become skilled hunters. Hunter-gatherer children as young as 3 years old were observed to track and stalk small animals and one another in their play (Liebenberg, 1990). All of the respondents to our survey said that the boys in the culture they studied spent great amounts of time at playful tracking and hunting. The two respondents who studied the Agta—a culture where women as well as men hunt—noted that girls as well as boys in that culture engaged in much playful hunting. Young children might stalk and shoot at stationary targets, or at butterflies and toads, while pretending to hunt big game. By the age of 8 or 9 they might sometimes succeed in killing small mammals, which they would bring back to camp and cook, pretending they were adults bringing back big game. By their early

teenage years they might sometimes join adults in real big-game-hunting expeditions, still in the spirit of adventure and play.

Successful gathering also required great skill and knowledge. Hunter-gatherer women—and men, too, to the degree that they gathered—had to know which of the countless varieties of roots, tubers, seeds, fruits, and greens in their area were edible and nutritious, when and where to find them, how to dig them (in the case of roots and tubers), how to extract the edible portions efficiently (in the case of grains, nuts, and certain plant fibers), and, in some cases, how to process them to make them edible or more nutritious than they otherwise would be. These abilities included physical skills, honed by years of practice, as well as the capacity to remember, use, add to, and modify an enormous store of culturally transmitted verbal knowledge. Researchers have found that the ability of hunter-gatherer women to gather and process foods efficiently increased up to the age of about 40, just as the ability of the men to hunt effectively did (Bock, 2005; Kaplan et al., 2000). It is not surprising, therefore, that young children, especially girls, spent much time playing with digging sticks and with mortars and pestles, and at games that involved finding and identifying varieties of plants.

As is true in other cultures, boys and girls in hunter-gatherer cultures segregated themselves by sex for some but not all of their play. Boys would play at hunting and other men's activities; girls would play at gathering and processing plant foods, birthing, infant care, and other women's activities; and both boys and girls would play at the many activities engaged in by both men and women. Our survey question about the specific kinds of activities observed in children's play elicited many examples of valued adult activities, beyond hunting and gathering per se, that children mimicked in their play. Caring for infants, climbing trees, building vine ladders, building huts, using knives and other tools, making various sorts of tools, carrying heavy loads, building rafts, making fires, defending against attacks from pretend predators, imitating animals (a means of identifying animals and learning their habits), making music, dancing, storytelling, and arguing were all mentioned by one or more respondents. Hunter-gatherer groups have rich traditions of music, dance, and stories, so it is not surprising that the children made and played musical instruments, sang, danced, and told stories in their play. Depending on the culture, they might also create beaded designs or other visual artwork.

The outdoor life of hunter-gatherers, including the need to flee from or fend off predators, requires that people of all ages and both sexes maintain fit and agile bodies. In agricultural and industrial societies, boys generally engage in much more vigorous physical play than do girls, but in hunter-gatherer societies both sexes engaged, nearly equally, in a great amount of such play (Draper, 1988; Gosso et al., 2005; Turnbull, 1961). They would joyfully chase one another around and, depending on topography, would climb and swing on trees, leap, swim, carry heavy objects, and perform all sorts of acrobatics in their play. They also practiced graceful, coordinated movements in their dances.

PLAY AND THE DEVELOPMENT OF HUNTER-GATHERER SOCIAL SKILLS AND VALUES

As I have already pointed out, social play, by its very nature, requires continuous cooperation, attention to and satisfaction of one another's needs, and consensual decision making. These are precisely the skills and values that are most central to hunter-gatherer social life. By allowing their children to spend essentially all of their time playing, hunter-gatherer adults allowed their children unlimited practice of the social skills and values that they held most dear. The age-mixed nature of the play, and the fact that it occurred in a cultural context where boasting or trying to prove oneself better than others was ridiculed, ensured that the play was even more cooperative and less competitive than is play in other cultures.

Using data from the Human Relations Area Files, John Roberts and his colleagues concluded that hunter-gatherer cultures were the only category of cultures that completely lacked competitive games (Sutton-Smith & Roberts, 1970). In a chapter describing Ju/'hoan children's play, Lorna Marshall (1976) noted that even games with formal rules, which could be played competitively, were played noncompetitively in the groups that she observed. All of the respondents to our survey stressed the noncompetitive nature of the play that they observed. For example, P. Bion Griffin commented that the only consistent rule of the play that he observed among Agta children was that "no one should win and beat another in a visible fashion."

Many of the games that hunter-gatherers played involved close coordination of the players' movements with those of the other players. This was true of all of their dancing and dancelike games, but it was also true of many of their other games. For example, in playful hunting with nets, the net-handlers and bush-beaters had to coordinate their actions just as adults had to in real net hunting. Another example is a tree-swinging game, in which children would coordinate their actions to bend a sapling to the ground and then release it all at once, so that the one who didn't let go would swing wildly in the treetop or be catapulted through the air (Turnbull, 1982). Such games, presumably, not only helped children learn to work together as a team but also helped bind them together emotionally as a community who cared about one another.

Several researchers have commented on the games of give-and-take played by hunter-gatherer infants with older children or adults (Bakeman et al., 1990; Eibl-Eibesfeldt, 1989; Gosso, 2005). Infants as young as 12 months old, or even younger, would delightfully give an object to the older playmate, then receive it, then give it again, and so on. The joy of such giving seems to lie in the instincts of all normal human infants. In a series of experiments conducted in the United States, nearly every one of more than 100 infants, aged 12 to 18 months, spontaneously gave toys to an adult during brief sessions in a laboratory room (Hay & Murray, 1982; Rheingold, Hay, & West, 1976). In our culture, such giving by infants is not much commented upon, but in at least some hunter-gatherer cultures it was celebrated,

much like infants' early words are in our culture. Among the Ju/'hoansi, such giving by infants was deliberately cultivated. Grandmothers, in particular, initiated infants into the culture of sharing and giving by encouraging such games and by guiding infants' hands in the giving of beads to others (Bakeman et al., 1990; Wiessner, 1982). This is the one example of systematic, deliberate adult influence on children's play that I have found in the hunter-gatherer literature. No human trait was more important to the hunter-gatherer way of life than the willingness to give or share.

To be a successful adult hunter-gatherer, one must not only be willing and able to cooperate with others but also be able to assert one's own needs and wishes effectively, without antagonizing others. Practice at such self-assertion occurs in social play everywhere, as players negotiate the rules and decide who gets to play what part. In addition, hunter-gatherer children practiced such assertion more explicitly as they mimicked adult arguments in their play. For example, Turnbull (1982, p. 134) described, as follows, how Mbuti children, age 9 on up, playfully rehashed and tried to improve upon the arguments they had heard among adults:

"It may start through imitation of a real dispute the children witnessed in the main camp, perhaps the night before. They all take roles and imitate the adults. It is almost a form of judgment for if the adults talked their way out of the dispute the children, having performed their imitation once, are likely to drop it. If the children detect any room for improvement, however, they will explore that, and if the adult argument was inept and everyone went to sleep that night in a bad temper, then the children try and show that they can do better, and if they cannot, then they revert to ridicule which they play out until they are all rolling on the ground in near hysterics. That happens to be the way many of the most potentially violent and dangerous disputes are settled in adult life."

PLAY AND THE DEVELOPMENT OF PERSONAL AUTONOMY AND SELF-CONTROL

The personality traits of the ideal hunter-gatherer are different from those of the ideal farmer (Barry, Child, & Bacon, 1959). Success in farming depends on adhering to tried-and-true methods. Creativity is risky, because if a crop fails a whole year's food supply may be lost. Moreover, farming societies are generally hierarchically structured, so obedience to those higher in rank is often essential to social and economic success. In contrast, success in hunting and gathering requires continuous, creative, intelligent adaptation to the ever-changing conditions of nature. For hunter-gatherers, the best assurance that food will arrive in camp on any given day derives from the accumulated efforts of diverse individuals and teams, each foraging in their own ways and using their own best judgments. The diversity of methods, coupled with the sharing of food among all members of the band, creates a hedge against the possibility that anyone will go for days without food. Thus, while the ideal farmer tends to be obedient, rule abiding, and conservative,

the ideal hunter-gatherer tends to be assertive, willful, creative, and willing to take risks. A number of researchers have contended, quite reasonably, that relatively strict parenting promotes the rule-abiding obedience required of farmers and that permissive parenting promotes the self-initiative, creativity, and individual autonomy required of hunter-gatherers (Barry et al., 1959; DeVore, Murdock, & Whiting, 1968; Gould, 1969).

By definition, play entails continuous practice of self-initiative, creativity, and individual choice. Players must follow rules, but the rules always leave room for creative choices, and players are continuously free to modify rules to meet their wishes and prevailing environmental conditions. Moreover, players in a social game are free to quit if they don't like the rules and can't get others to change them. Likewise, hunter-gatherer adults and families who no longer wish to conform to the procedures of their band are free to start a new band or move to a more compatible neighboring band where they have relatives and friends (Ingold, 1999; Woodburn, 1982). Such mobility is unavailable to farmers, who are tied to the land that they cultivate. By allowing their children to play all day, hunter-gatherers allowed their children to develop fully the characteristics of personal autonomy that are essential to hunter-gatherer success.

Another trait of hunter-gatherers often commented upon by those who have observed them is their extraordinary self-control, especially their ability to remain cheerful in the face of pain and adversity. For example, after quoting another researcher about the cheerfulness of people in another hunter-gatherer culture, Richard Gould (1969, p. 120) wrote: "Often I have had cause to notice this same good cheer and readiness to laugh and joke among the people of the Gibson Desert [hunter-gatherers in Australia], even when they are plagued by boils and heat, pestered by flies, and short of food. This cheerfulness seems to be part of a disciplined acceptance of frequent hardships which complaints would only aggravate."

Elizabeth Marshall Thomas commented similarly about the Ju/'hoansi whom she observed. As illustration, she recounted a scene in which a young Ju/'hoan girl had accidentally stepped into a trap that a visiting biologist had set for a hyena far from the campsite. The teeth of the steel trap, which she could not open, had gone through her foot, and because the trap was fixed securely into the ground, she could not move it to sit down but had to stand on her nontrapped foot. She apparently stood, quietly and calmly so as not to attract predatory hyenas, until her uncle found her many hours later. Here are Thomas's words (2006, pp. 216–217):

"I will always remember her calmness as we brought her to the encampment and dressed the wound. She had been alone, helpless, and in pain for many hours in a place frequented by hyenas, yet she acted as if nothing had happened, nothing at all. Instead, she chatted with other people about this and that in an offhand manner. To me, such composure in these circumstances did not seem possible, and I remember wondering if their nervous systems were the same

as ours. But of course, their nervous systems were the same as ours. It was their self-control that was superior. You can say that things are wrong, but you cannot show it. Your body language must suggest that everything is fine.”

Lev Vygotsky (1978b) probably did not have this degree of self-control in mind when he wrote about the role of play in the development of children’s capacities to control their impulses. Moreover, no researcher that I know of has suggested that hunter-gatherers’ extraordinary self-control is developed through play. Yet, I suggest, it may be no coincidence that the same cultures that allowed their children the greatest freedom to play also produced people who seemed to have the greatest capacity for self-control. Children’s strong drive to play leads them to ignore bodily discomforts and psychological irritations in order to continue following the rules of the game. In their physical play, children continuously dose themselves with moderate yet manageable amounts of fear, as they swing in trees, dive from cliffs, and engage in other thrilling adventures. In their social play, children may also often experience anger, to varying degrees, as will occur whenever people interact in close proximity over time. But to continue playing—which they strongly wish to do—they must find ways to control those emotions.

Learning to control emotions may, in fact, be one of the primary functions of play. Several researchers have supported an emotion regulation theory of play’s functions, largely on the basis of play deprivation experiments with animals (Pellis, Pellis, & Bell, 2010). The most obvious behavioral deficits in monkeys and rats that have been deprived of play during their juvenile development involve emotional dysregulation. The animals show excessive, maladaptive, incapacitating fear and/or aggression when placed in stressful situations. Perhaps the extraordinary amounts of play engaged in by hunter-gatherer children helped to promote their extraordinary capacities to regulate their emotions in ways that were adaptive to their conditions of life.

Conclusion

By describing the universal identifying characteristics of play, the social conditions for play in hunter-gatherer bands, and the specific ways in which hunter-gatherer children played, I have in this chapter shown how hunter-gatherer children apparently acquired through play the skills, knowledge, values, and character traits essential to hunter-gatherer success. As Karl Groos (1901) pointed out long ago in his Darwinian analysis of human play, children come into the world predisposed to incorporate the adult activities that they see around them into their play and in that way become skilled at those activities. Consistent with this view, hunter-gatherer children played at all of the activities central to their culture, especially the most difficult ones.

The extraordinary play drive of human children was presumably shaped, from its earlier primate origins, by natural selection in the context of the

hunter-gatherer way of life. Therefore, it may be no coincidence that the values, social skills, and character traits that seem to be part and parcel of all social play are precisely the values, social skills, and character traits that are essential to hunter-gatherers' egalitarian ways of life. Social play inhibits the drive for dominance; requires sharing, cooperation, and consensual decision making; fosters individual autonomy and self-assertion within a context of cooperation; and fosters the ability to control one's impulses and emotions. All of these apparently contributed to hunter-gatherers' abilities to survive.

This article has focused on play in hunter-gatherer cultures, but it is worthwhile to speculate about implications for our culture, today. Over the past half century, in the United States and other modern societies, there has been a continuous decline in children's freedom to play, especially in their freedom to play socially, in age-mixed groups, outdoors, away from adults (Chudacoff, 2007; Clements, 2004; Gray, 2011a). During this same period there has been a continuous rise—based on standard, unchanged measures—in childhood and adolescent anxiety, depression, feelings of helplessness, impulsiveness, and narcissism (Gray, 2011a; Twenge et al., 2010; Twenge, Konrath, Foster, Campbell, & Bushman, 2008; Twenge, Zhang, & Im, 2004). It seems quite plausible to me, based on the analysis of play's value presented here, that the rise in all of these forms of psychopathology may be at least partly a result of the decline of play (Gray, 2011a).

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