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Wild Justice - Honor and Fairness among Beasts at Play

Marc Bekoff and Jessica Pierce

ABSTRACT

This essay challenges science's traditional taboo against anthropomorphizing animals or considering their behavior as indicative of feelings similar to human emotions. In their new book *Wild Justice: The Moral Lives of Animals*, the authors argue that anthropomorphism is alive and well, as it should be. Here they describe some activities of animals, particularly animals at play, as clear signs that they have recognizable emotions and moral intelligence. Based on years of behavioral and cognitive research, the authors discuss in their book that animals exhibit a broad repertoire of moral behaviors, including empathy and cooperation, but here they concentrate on the fairness and trust so essential to any kind of play, animal or human. They contend that underneath this behavior lays a complex range of emotions, backed by a high degree of intelligence and surprising behavioral flexibility. Animals, they find, are incredibly adept social beings. They rely on rules of conduct in their play, just as do humans, which in turn, helps prepare animals for dealing with the intricate social networks that are essential to their survival. The authors conclude that there is no moral gap between humans and other species. As the play of animals helps to make clear, morality is an evolved trait humans unquestionably share with other social mammals.

"A Sense of Fair Play Is Only Human, Researchers Find."¹ This headline appeared in the *Los Angeles Times* as we were first writing this work. The study the *Times* article discussed had recently been published in the prestigious journal *Science* and had attracted a lot of attention. Keith Jensen and his colleagues at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, devised what they called an "ultimatum game," a favorite tool of economists who study decision making. This sort of game involves two players, one of whom is given a small amount of money and is asked to divide it between the two however he or she sees fit. The partner knows how much money is being divided. If he or she receives too low an offer, one that seems unfair, the recipient may reject it, which results in neither player receiving any money at all.

Jensen's study was unique because the players were chimpanzees and the currency was raisins. Jensen and his team found that the chimpanzees did not play the game the way humans typically do. In studies of human behavior, offers of less than 20 percent of the money are almost always rejected. In contrast, the chimpanzees accepted any offer from their partners and did not get upset when the chimpanzees offering the raisins kept most for themselves.

In the summary of their research, the authors note, "These results support the hypothesis that other-regarding preferences and aversion to inequitable outcomes, which play key roles in human social organization, distinguish us from our closest living relatives." They concluded, in other words, that chimpanzees are not sensitive to fairness. Ironically, however, the behavior of these chimpanzees is considered more rational in pure economic-game-theory terms.² The *Los Angeles Times* article quoted

the study's lead author Keith Jensen as concluding that the chimps behaved more rationally than people because, he said, "it makes perfect economic sense to accept any nonzero offer and to offer the smallest amount possible while keeping the most for yourself."³

Justice Is Not Some Bone-in-the-Sky Ideal

Jensen's research on resource sharing is fascinating, and it offers a glimpse into what may turn out to be some very interesting differences in how human fairness behaviors differ from the fairness behaviors of other species. But the conclusion of the authors—that chimpanzees do not have a sense of fairness—does not follow from their work. The only conclusion we can safely draw from this specific research project involving an ultimatum game is that chimpanzees do not behave like humans, leaving wide open the question of whether chimpanzees have a sense of fairness.

Sarah Boysen, a primatologist at Ohio State University who was asked to respond to Jensen's research for the article, draws a different conclusion from the researchers. She believes that chimpanzees have a strong sense of justice, though one different from ours. Boysen notes, "Deviations from their code of conduct are dealt with swiftly and succinctly, and then everybody moves on."⁴ Research by Sarah Brosnan and Frans de Waal on inequity aversion in captive chimpanzees and capuchin monkeys offers support for Boysen's claim. So too does recent research by Friederike Range and her colleagues on inequity aversion in domestic dogs. We'll discuss this line of research below.⁵

Jensen's experiment may open a window into the evolution of fairness and other-regarding behavior, but it should also serve as a cautionary tale. The few published studies that investigate fairness in nonhuman primates involve only a handful of animals, which limits our ability to gather information on individual variability. Furthermore, because these studies have been conducted over a short period of time, we are unable to get an appreciation for emerging patterns of behavior within a stable social group. That the animals live in controlled, captive conditions also may be a confounding factor as is that they are required to perform tasks they do not typically perform in the wild. This is not to say that the data are useless but rather to stress that the negotiation of fairness among animals is a dynamic process that likely changes from one social situation to another.

Justice in Animals Other Than Primates

Jensen and colleagues conclude that if the closest relative to humans, *Pan troglodytes* (the common chimpanzee), does not have a sense of fairness, certainly no other animals will. Case closed. But the case is not closed, not by any means. Virtually all of the research on fairness in animals has been conducted on nonhuman primates. Yet, there are other fascinating species such as wolves and coyotes and even domestic dogs from which we can gain insights into the behavior patterns that these animals use to negotiate fair deals. In fact, noted philosopher Robert Solomon, in his book *A Passion for Justice*, asks us to consider wolves, which live in packs, exemplars of highly developed, cooperative, and coordinated behavior. Solomon writes:

Some wolves are fair, a few are not. Some arrangements are fair (from the wolf's own perspective); some are not. Wolves have a keen sense of how things ought to be among them . . . justice is just this sense of what ought to be, not in some bone-in-the-sky ideal theoretical sense but in the tangible everyday situations in which the members of the pack find themselves. Wolves pay close attention to one another's needs and to the needs of the group in general. They follow a fairly strict meritocracy, balanced by considerations of need and respect for each other's "possessions," usually a piece of meat.⁶

We need to look at animals other than nonhuman primates and study what they do when they interact socially. In the spirit of open-minded science, we should give other animals a chance to show us who they are, what they know, and what they feel. Closing the door for ideological reasons on the possibility that species other than primates have a sense of justice--that if nonprimates do not do something, then surely other animals do not either--means that we will never come to appreciate the full array of behaviors in the animal kingdom.

We believe that a sense of fairness or justice may function in chimpanzee society and in a broad range of other animal societies as well. While there is less research on justice than on cooperation and empathy, for example, comparative data on social play behavior--an area of research that has not been given much attention by primatologists--speak to the question of the distribution of justice in nonhuman animals.

Wild Justice

The Merriam-Webster dictionary defines just and justice this way: *just* is what is merited or deserved; *justice* is the maintenance of what is just, especially by adjustment of conflicting claims or assignment of merited rewards or punishments.

Justice is a set of expectations about what one deserves and how one ought to be treated. Justice has been served when these expectations have been appropriately met. What we call justice identifies behaviors that are related to fairness, including a desire for equity and a desire for and capacity to share reciprocally. Justice also includes various behavioral reactions to injustice, including retribution, indignation, and forgiveness, as well as reactions to justice such as pleasure, gratitude, and trust.

The word *justice* does not have any special meaning in biology. It lacks a rigorous or even a semirigorous working definition in part because very few studies have been conducted on justice in animals and there has been very little discussion of this phenomenon among evolutionary biologists and ethologists. As research accumulates, a vocabulary will inevitably evolve, and it will be important to make choices about which terms more closely fit observed patterns of behavior.

We realize that discussing justice in animals might invite comments of the surely-you're-joking variety. But we are not. Despite splashy headlines to the contrary, researchers still do not know much about other animals' reactions to inequity and unfairness. But we feel confident that some animals do, indeed, have a sense of justice. Why do we make this claim while others hesitate to do so?

First of all, we argue from an evolutionary perspective that stresses continuity. A sense of justice seems innate and universal in humans. Research from psychology, anthropology, and economics supports this conclusion. For example, research conducted by economist Ernst Fehr and his colleagues found that humans get inordinately upset about unfairness and will even forgo immediate personal gain in order to punish a perceived injustice as in the ultimatum game described in the beginning of this article.⁷ Consider also that babies who cannot yet talk show social intelligence that may provide the foundation for morality and for a sense of justice used later in life. At six months of age, before they can sit or walk, human babies are able to assess another person's intentions and use these social evaluations to decide who is a friend and who is a foe. In one study conducted by Kiley Hamlin and her colleagues at Yale University, infants viewed a puppet show in which there were a nice character and a character who was nasty; one helped, the other hindered a third character trying to walk uphill. Afterwards, when the infants were encouraged to reach out for the helper or the hinderer, they chose the helper. Furthermore, the infants preferred the helper over a neutral character and the neutral character over the hinderer.

Publishing her study in *Nature*, Hamlin noted, "We don't think that this says that babies have any morality, but it does seem an essential piece of morality." And, furthermore, "Our findings indicate that humans

engage in social evaluation far earlier in development than previously thought, and support the view that the capacity to evaluate individuals on the basis of their social interactions is universal and unlearned.” The authors also conclude, “Social evaluation is a biological adaptation.”⁸

We agree with the general conclusions of Hamlin’s study and offer that even in the absence of symbolic language animals are able to make these sorts of social evaluations too, and these assessments are foundational for moral behavior in animals other than humans. Indeed, recent research by Francys Subiaul of George Washington University and his colleagues showed that captive chimpanzees are able to make judgments about the reputation of unfamiliar humans by observing their behavior--were they generous or stingy in giving food to other humans?⁹ The ability to make character judgments—generous or stingy--is just what we would expect to find in a species in which fairness and cooperation are important in interactions among group members.

The principle of parsimony suggests the following hypothesis: A sense of justice is a continuous and evolved trait. And, as such, it has roots or correlates in closely related species or in species with similar patterns of social organization. It is likely, of course, that a sense of justice is going to be species specific and may vary depending on the unique and defining social characteristics of a group of animals; evolutionary continuity does not equate to sameness.

Furthermore, fairness is not merely an overlay that masks competition and selfishness. Lee Dugatkin and Marc Bekoff have shown, using game-theory models, that always acting fairly should be more common than never acting fairly and that continuing to be fair during social development can be an evolutionarily stable strategy (ESS).¹⁰ (An “evolutionarily stable strategy” is one, which, if adopted by a population, is resistant to invasion by any alternative strategy.) So, like cooperation, fairness has played a significant role in the evolution of social behavior. It is not a dog-eat-dog world because, really, dogs don’t eat other dogs.

Second, and even more central to our argument about justice in animals, are the data from animals themselves. Although little research has focused directly on the question of whether animals have a sense of justice, tantalizing clues come from research on various other aspects of animal behavior. Our agenda here is to lay out these hints. We begin with social-play behavior, which offers the most compelling evidence for a sense of fairness in social mammals. In the context of play behavior, we will look at ways in which animals understand, communicate, and enforce a set of rules about fairness. We then turn to the few studies of what researchers call “inequity aversion” because these studies have a direct bearing on our discussion of fairness and justice. Finally, we will explore some of the behavioral reactions to fairness and injustice, including pleasure, indignation, trust, forgiveness, and retribution.

What Has Play to Do with Morality?

Morality is rather like a game: there are agreed-upon rules which everyone must follow, and there are sanctions for breaking the rules. The rules are, in a sense, an imaginative construction. They are relative to the game at hand. In social groups, as in games, the integrity of the collective depends upon individuals agreeing that certain rules will regulate their behavior. At any given moment, individuals know their place or role and the places and roles of other group members.

Social play, in turn, provides insights into morality. In particular, it opens a window into behavior patterns that indicate our sense of justice. Social play is a voluntary activity requiring that participants understand and abide by the rules. It rests on foundations of fairness, cooperation, and trust, and it can break down when individuals cheat. During social play, individuals can learn a sense of what is right or wrong--what is acceptable to others--the result of which is the development and maintenance of a social group (a game)

that operates efficiently. Thus, fairness and other forms of cooperation provide a foundation for social play. Animals have to continually negotiate agreements about their intentions to play so that cooperation and trust prevail, and they learn to take turns and set up “handicaps” that make play fair. They also learn to forgive.

Social play has unique rules of engagement about how hard one can bite, about mating being off limits, and about assertions of dominance being absent or kept to a minimum. Think about games such as tag or hide-and-seek or keep-away. There are special rules that apply during these games but not at other times. Those joining the game must understand these rules (which are often implicit) and abide by them, lest they be labeled a cheater and expelled from the game. If players do not cooperate, play can easily escalate into fighting.

When animals play, they must *agree* to play. They must cooperate and behave fairly. Further, when fairness breaks down, play not only stops, it becomes impossible. *Unfair play* is an oxymoron, and this is what makes play such a clear window into the moral lives of animals.

What Is Play and Why Do It?

In field notes made from observing dogs at play, Marc Bekoff recorded:

Jethro bounds towards his dog friend, Zeke, stops immediately in front of him, crouches on his forelimbs, wags his tail, barks, and immediately lunges at him, bites his scruff and shakes his head rapidly from side-to-side, works his way around to his backside and mounts him, jumps off, does a rapid bow, lunges at his side and slams him with his hips, leaps up and bites his neck, and runs away. Zeke takes wild pursuit of Jethro and leaps on his back and bites his muzzle and then his scruff, and shakes his head rapidly from side-to-side. Suki bounds in and chases Jethro and Zeke, and they all wrestle with one another. They part for a few minutes, sniffing here and there and then rest. Then, Jethro walks slowly over to Zeke, extends his paw toward Zeke's head, and nips at his ears. Zeke gets up and jumps on Jethro's back, bites him, and grasps him around his waist. They then fall to the ground and mouth wrestle. Then they chase one another and roll over and play. Suki decides to jump in and the three of them frolic until they're exhausted. Never did their play escalate into aggression.

The description of the dogs at play makes clear that playful behavior is a widespread phenomenon and that in playing animals use behavior patterns from a variety of other social contexts. When they play, for example, animals mix actions they use in mating (mounting) with behaviors that are used during fighting (vigorous biting), looking for prey (stalking), and avoiding being someone else's dinner (fleeing). Thus, social play can be confusing to the players themselves, and they need to know that play is the name of game as the encounter progresses.

According to University of Tennessee psychologist Gordon Burghardt, an expert on animal play, the evolutionary roots of play may go back over a billion years. Evidence exists of play behavior in diverse phylogenetic groups, including placental mammals, birds, and even crustaceans.¹¹ Of course not all animals play, but oddly enough, the animals we discuss in *Wild Justice: The Moral Lives of Animals*--nonhuman primates, rodents, canids, felids, ungulates, pachyderms, and cetacean--tend to be the most playful animals. Is the fact that all these various animals play merely a coincidence? Probably not.

Play is adaptive and serves important functions in diverse animals. In some, such as members of the dog family (dogs, coyotes, wolves, foxes), play is important for the development of social skills and for the formation and maintenance of social bonds. During play, animals learn social norms and reciprocity. Play

can also be practice for the “real thing,” as when wolf cubs or male mountain sheep play at fighting. Play also provides physical exercise (aerobic and anaerobic) involving bones, tendons, joints, and muscles and cognitive training in the form of “eye-paw” coordination. Elsewhere, Marc Bekoff, together with Marek Spinka and Ruth Newberry (both of whose specialty is pig behavior), view play as training for the unexpected because play is a highly variable behavior and prepares individuals for rapidly changing and novel or surprising situations.¹²

Neuroscientists and ethologists have argued that play creates a brain with more flexibility and more learning capacity. During play, the player continually assesses its playmates’ intentions, signals, and respect for certain rules unique to play. When coyote cubs play, their behavior is variable and unpredictable. They jump from one kind of behavior to another, engaging patterns from various contexts ranging from reproduction, predation, and aggression. These activities stimulate the brain and help it draw connections. Thus, play is cognitively demanding and can be thought of as “brain food.” It helps to rewire the brain by increasing the connections between neurons in the cerebral cortex. It hones cognitive skills including logical reasoning and behavioral flexibility, and it provides important nourishment for brain growth. Psychologist Stephen Siviy’s research showed that bouts of play in rats increase the brain levels of c-FOS, a protein associated with the stimulation and growth of nerve cells.¹³

University of Lethbridge psychologist Sergio Pellis, one of the leading researchers of animal play, even believes that larger brains are linked to greater levels of play. And researcher Kerrie Lewis, who has studied play in primates, has shown that primate species with greater levels of social play have larger neocortex size relative to less playful primates.¹⁴

Animals demonstrate a strong selection for playing fairly because most, if not all, individuals benefit from adopting this behavioral strategy. Fair play may also foster group stability. Numerous mechanisms--including play invitation signals, variations in the sequencing of actions performed during play when compared to other contexts, self-handicapping, and role reversal--have evolved to help initiate and maintain social play in many species of mammals.

Play is not only serious business, it is also fun. Animals feel deep joy and pleasure from playing alone and with friends. Rats emit a high-frequency chirp when they play wrestle and when they get tickled, a sound that some rat researchers describe as a laugh. Dogs seem to laugh too. They make a kind of breathy forced exhalation that is recognized by other dogs as an invitation to play. It feels good to laugh because the brain releases dopamine. The rhythm, dance, and spirit of animals at play are also incredibly contagious. They spread like an epidemic; just seeing animals playing can stimulate play in others.

Fair Play: Fine Tuning on the Run

The social dynamics of play require that animals agree to play and not to eat one another. Play means play, not fighting or mating. When animals violate any of these expectations, other animals react to the unfairness. For example, young coyotes and wolves react against unfair play by ending the encounter or by avoiding those who entice them into play but then do not follow the rules. Coyotes and wolves who play unfairly, researchers have observed, have difficulty finding playmates after they have been recognized as cheaters.

Domestic dogs also will not tolerate cheaters. They avoid the dogs who play unfairly or chase them from play groups. While studying dog play on a beach in San Diego, California, Alexandra Horowitz observed a dog she called Up-ears enter into a play group and interrupt the play of two other dogs, Blackie and Roxy. Up-ears was chased out of the group. When she returned, Blackie and Roxy stopped playing and looked

off toward a distant sound. Roxy began moving in the direction of the sound, and Up-ears ran off following their line of sight. Free of Up-ears, Roxy and Blackie immediately began playing once again.¹⁵

Animals play fair, as we have shown, and they react negatively to unfair play behavior. In this context, fairness is an individual animal's specific social expectations, not some universally defined standard of right and wrong. In human terms, it is similar: If you expect a friend to play with you and he becomes aggressive and domineering or he begins hitting you instead of playing, you feel unfairly treated because his behavior is so different from your social expectations. We have found, by studying the details and dynamics of social-play behavior in animals, that animals exhibit a similar sense of fairness. We know animals have social expectations because they show surprise when things do not go right during play. When that happens, only further communication keeps play going. If, for example, a dog becomes too assertive, too aggressive, or tries to mate during play, the playmate often cocks her head from side-to-side and squints, as if she is wondering what went wrong. For a moment the violation stops play, and play only continues if the aggressive playmate "apologizes" by gesturing--for example with a play bow--his intention to keep playing.

We stress that social play is firmly based on a foundation of fairness. Play only occurs if for the time they are playing animals have no other agenda but to play. They put aside or neutralize any inequalities in physical size and social rank. As we will see, large and small animals can play together, and high-ranking and low-ranking individuals can play together, but not if one of them takes advantage of its superior strength or status.

It may turn out that play is a unique category of behavior that tolerates asymmetries more than other categories of social behavior. Animals really work at reducing inequalities in size, strength, social status, and a disposition to play. Play cannot occur if the animals choose not to engage in the activity, and the equality or fairness needed for play to continue makes it different from other forms of cooperative behavior (such as hunting and care giving). Play is perhaps uniquely egalitarian. And if we define justice as a set of social rules and expectations that neutralize differences among individuals in an effort to maintain group harmony, then that is exactly what we find in animals when they play.

Don't Bow If You Don't Want to Play

Let's look at the data that support our claims about the connection between social play and morality. Most of the research on play and fairness has been on domestic dogs and their wild relatives, coyotes and wolves. While we focus here on the animals we know the best, there are also examples of other species that support our views concerning the connection between social play and morality.

When dogs and their relatives play, they use actions they also use in other activities, such as dominance interactions, predatory behavior, antipredatory behavior, and mating. Because there is a chance that behavior patterns they perform during ongoing social play can be misinterpreted as real aggression or mating, individual animals have to signal others: "I want to play," "This is still play no matter what I am going to do to you," or "This is still play regardless of what I just did to you."

Canids (domestic dogs, wolves, coyotes, and other members of the dog family) frequently begin play with a bow, and they repeatedly bow during play sequences to ensure their playful intentions remain clear. A dog signals another to play by crouching on her forelimbs, raising her hind end in the air, and often barking and wagging her tail as she bows. After the players agree to play--not fight, prey upon, or mate--they engage in ongoing, rapid, and subtle exchanges of information in order to work out their cooperative agreement on the run, thus guaranteeing that the activity remains playful.

After many years of studying play in infant canids, Marc Bekoff realized that the bow is not used randomly but rather with a purpose.¹⁶ For example, a dog uses biting and rapidly shaking his head side-to-side during serious aggressive and predatory encounters, and these actions can easily be misinterpreted during play if the meaning is not modified by a bow. Not only are bows used right at the beginning of play to signal to another dog “I want to play with you,” but they are also used right before biting accompanied by the rapid side-to-side head shaking as if to indicate “I am going to bite you hard, but it is still in play” and right after vigorous biting as if to say “I am sorry I just bit you so hard, but it was play.” Bows reduce the likelihood of aggression.

Play signals are almost always used honestly. As we have mentioned, cheaters who bow and then attack are unlikely to be chosen as play partners, and they have difficulty getting others to play with them. If a dog does not want to play, she should not bow.

Promoting Egalitarianism and Reducing Inequities

Dogs, wolves, coyotes, and other animals engage in role reversing and self-handicapping to maintain social play. Each of these strategies help canids neutralize inequalities in size and dominance rank among players and promote the reciprocity and cooperation that is needed in play. Given that play has to be cooperative and carefully negotiated, any action that reduces inequities and fosters symmetry would be valued during social play in order to continue the play interaction.

Self-handicapping (or play inhibition) happens when an animal behaves in a way that might compromise her in an activity other than play. For example, a coyote might decide not to bite her play partner as hard as she can because a soft bite helps to maintain the playful mood. Because the fur of young coyotes is very thin, an intense bite hurts and causes high-pitched squeals, which can easily end the playful exchange. And an adult wolf’s bite can generate as much as fifteen hundred pounds of pressure per square inch, so there is a good reason to hold back. In short, an intense bite is a play stopper.

In role reversal, a dominant animal performs an action during play that he would not normally do during real aggression. A dominant wolf, for example, would not roll over on his back--making himself vulnerable to attack--during a fight, but he would while playing. In some instances, reversing roles and self-handicapping might occur together. A dominant wolf might roll over while playing with a subordinate dog and at the same time inhibit the intensity of his bite. Self-handicapping and reversing roles are like other specific invitations to play--they indicate an animal’s intention to continue playing, and they seem to be important to maintaining fair play.

Although we focused on dogs and their wild relatives, other animals also work hard to negotiate fair play. For example, Australian biologist Duncan Watson observed red-necked wallabies engaging in self-handicapping. These playful creatures adjust their play to the age of their partner. When a partner is younger, the older animal adopts a defensive, flat-footed posture and engages in pawing rather than sparring. The older player takes the lead in tolerating its partner’s tactics and in prolonging the play interactions.¹⁷

Sergio Pellis discovered rat play consists of sequences during which individuals assess and monitor one another then adjust their own behavior to maintain the play mood. When they violate the rules of play, when fairness breaks down, so does play itself. Even for rats, fairness and trust are important in the dynamics of playful interactions. Pellis observed that when adult rats play, the subordinate individual directs playful contacts (touching or nearly touching a second rat’s nape with snout) toward the dominant rats. Subordinate rats try to retain a symmetrical play relationship so that they are not injured and the dominant rats knew that they are playing, not fighting. Dominant rats tend to evade these encounters with

adult defense tactics, while subordinate rats, when playfully attacked, roll over into the juvenile defense position. The initiation of such playful attacks by subordinate rats may lead dominant rats to tolerate the subordinates' presence.¹⁸

So, why do animals carefully use play signals to tell others that they truly want to play, that they do not intend to beat them up? Why do they engage in self-handicapping and role reversal? Why do they fine tune play to keep it going? It is plausible to argue that during social play, while individuals are having fun in a relatively safe environment, they learn ground rules about what behavior patterns are acceptable to others. They learn how hard they can bite, how roughly they can interact, and how they can resolve conflicts without having to stop the playful encounter.

Animals place a premium on playing fairly and trusting others to do so. It is also possible that individuals generalize codes of conduct learned in play with specific individuals to other group members and to other situations where justice comes into play, providing reciprocity in, perhaps, grooming, sharing food, negotiating social status, and defending resources. Codes of social conduct exist that regulate actions and that dictate what is not permissible. The existence of these codes has much to say about the evolution of social morality. What could be a better atmosphere in which to learn about fairness and cooperation than during social play, where there are few penalties for transgressions?

The Pleasure of Play

In his book *The Descent of Man and Selection in Relation to Sex*, Charles Darwin wrote, "Happiness is never better exhibited than by young animals, such as puppies, kittens, lambs, &c., when playing together, like our own children."¹⁹ Animals typically only play when they are relaxed and healthy, so the inherent joy and serenity in play often spreads to anyone who is watching.

Ethologist Jonathan Balcombe says that pleasure is "one of the blessings of evolution." It is one of the ways in which nature rewards adaptive behavior. Humans (especially the Puritans among us) may think that morality and pleasure are opposing forces; anything fun is naughty and wrong. Nature knows better. Balcombe notes, "sensory pleasure induces behaviors that improve homeostasis," presumably by helping to maintain and reward such behavior. Joy (or in stuffy, scientific terms, "positive affect") and pleasure play a key role in morality.²⁰

What we can see with our eyes is also being borne out by scientific research. Studies of brain chemistry in rats tell us that play is pleasurable and fun. Renowned neurobiologist Jaak Panksepp discovered in rats that play increases the opioid activity of the brain, enhancing the sense of pleasure and thus providing a neurochemical reward for engaging in play.²¹ If this is true in rats, and we already know it is true in humans, then there is little reason to believe that the neurochemical basis of play-inspired joy in dogs, cats, horses, and bears would be much different.

Apologizing and Forgiving: Holding Grudges Is a Waste of Time

What about forgiveness? The ability to forgive is another moral skill that is often attributed solely to humans. But the well-known evolutionary biologist David Sloan Wilson argues that forgiveness is a complex biological adaptation. In his book *Darwin's Cathedral: Evolution, Religion, and the Nature of Society*, Wilson says, "Forgiveness has a biological foundation that extends throughout the animal kingdom." And further, "Forgiveness has many faces--and needs to--in order to function adaptively in so many different contexts." While Wilson concentrates mainly on human societies, his views can be extended easily and legitimately to nonhuman animals. Indeed, Wilson points out that adaptive traits such as forgiveness might not require as much brain power as once thought.²² This is not to say that animals

are not smart, but rather that forgiveness might be a trait that is basic to many animals even if they do not have especially big and active brains.

Play sequences often involve acts of forgiveness and apology. For example, if Jethro bit Zeke too hard, stopping play for a moment, Jethro would then bow and show Zeke by bowing that he did not mean to bite his play partner as vigorously as he did. Jethro is apologizing and asking for forgiveness. In order for play to resume, Zeke has to trust that Jethro meant what he signaled when he bowed, that Jethro was being honest. While this may seem farfetched to some readers, the facts show that animals use play bows strategically to maintain the play mood when it might otherwise end.

Generally, then, social play is a perfect activity to consider when we look for moral behavior in animals (and in humans). The basic rules of the game are: ask first, be honest and follow the rules, and admit when you are wrong.

Inequity Aversion: I'll Have What She's Having

A different area of research sheds light on the sense of fairness and equity among animals. Several primate studies have focused attention on inequity aversion, a negative reaction arising when expectations about the fair distribution of rewards have been violated. Researchers have observed two basic forms of inequity aversion: the first is an aversion to seeing another individual receive more than you do; the second is an aversion to receiving more yourself than another individual receives. Only the first type of inequity aversion--the she-got-more-than-I-did variety--has been explored in animals.²³

Sarah Brosnan and Frans de Waal tested five female captive capuchin monkeys for inequity aversion. Capuchin monkeys are a very social and cooperative species. The monkeys commonly share their food and carefully monitor equity and fair treatment among peers. Social monitoring for equity is especially evident among females. Brosnan and de Waal note, "Females pay closer attention than males to the value of exchanged goods and services."

Brosnan and de Waal first trained a group of capuchins to use small pieces of rock as tokens of exchange for food. They then manipulated pairs of females to barter for treats. They had one monkey swap a piece of granite for a grape. They had a second monkey, who had just witnessed the rock-for-grape trade, swap a rock for a piece of cucumber, a much less desirable treat. The short-changed monkey refused to cooperate with the researchers. Not only did she not eat the cucumbers, she often threw them back at the scientists. In a nutshell, the capuchins expected to be treated fairly. They seemed to measure and compare rewards in relation to those around them. A single monkey who traded a rock for a cucumber was delighted with the outcome. Only when others seemed to get something better did the monkeys find the cucumber undesirable.

Skeptics have argued that these monkeys did not exhibit a sense of equity but rather a sense of greed and envy. And indeed they did. But greed and envy exist as counterparts to justice; unless you feel gyped, why would you feel envious? And why would you feel gyped unless you thought you deserved more?

Brosnan and de Waal speculate that monkeys, like humans, are guided by social emotions or "passions" that modulate an individual's response to "the efforts, gains, losses and attitudes of others."²⁴ Passions such as gratitude and indignation have evolved to nurture long-term cooperation and seem to exist in monkeys as well as in humans. And they may exist in other species.

Of these passions, indignation jumps out at anyone reading Brosnan and de Waal's study because it smacks so strongly of anthropomorphism. Indignation is aroused by a perceived sense of injustice. As de

Waal notes in *Good Natured*, “the outraged reaction that [injustice] may trigger serves to clarify that altruism is not unlimited, it is bound by the rules of mutual obligation” (i.e., fairness). De Waal also considers gratitude. His 2005 *Scientific American* essay about reciprocity in monkeys states, “This reciprocity mechanism requires memory of previous events as well as the coloring of memory such that it induces friendly behavior. In our own species, this coloring process is known as ‘gratitude,’ and there is no reason to call it something else in chimpanzees.” He clearly recognizes the implications of these observations of monkeys when he claims, “Thus, reading *A Theory of Justice*, an influential book by the contemporary philosopher John Rawls, I cannot escape the feeling that rather than describing a human innovation, it elaborates on ancient themes, many of which are recognizable in our nearest relatives.”²⁵

Another study by Brosnan, de Waal, and Hillary Schiff suggests that chimpanzees also display an aversion to inequity. In an experiment similar to the one conducted with capuchins, chimpanzees showed negative reactions to an inequity of reward. This study went further than the capuchin study and made initial forays into some fascinating nuances of behavior concerning fairness. Although chimpanzees responded to discrepancies in the level of reward, they seemed indifferent to discrepancies in the level of effort. Like the capuchins, the chimpanzees seemed unbothered by a superior reward (they did not show the second form of inequity aversion). Also, the strength of chimps’ reactions to inequity varied according to social context such as group size and kinship relations. In long-term and tightly knit social groups, the chimpanzees showed a higher tolerance for inequity.²⁶ Perhaps this is because individuals keep track of who does what to whom and--as predicted by respected evolutionary biologist Robert Trivers in his theory of reciprocal altruism--we would expect such patterns of social behavior to arise in long-lived groups in which individuals recognize one another over time. It is important that individuals remember who did what to whom and whom they should repay in the future.

These studies suggest that justice is situational. What is acceptable in one social context might be unacceptable in another. Therefore, in order to learn more about justice in animals we need to take into account the specific context in which they express their behavior, the size of the group, the longevity of social relationships, the stability of group membership, and nonsocial environmental conditions.

Fairness and Fitness: The Penalties of Breaching Trust

One question of major interest to biologists is how differences in the performance of a given behavior influence an individual’s reproductive success. Ethologist Niko Tinbergen, among others, noted that making this connection should be one of the goals of behavioral research. Might differences in play and variations in fair play affect an individual’s reproductive fitness? It is almost impossible to link fair play directly to an individual’s reproductive success or fitness. But some intriguing data from coyotes speak to the relationship between play and fitness.

Coyotes are fast learners when it comes to fair play, as they should be, for serious penalties occur when they breach the trust of their friends. Biologists call these penalties “costs.” Because such costs affect an individual’s relations to the other coyotes, an individual might suffer some decline in his or her reproductive fitness if he or she does not play by the expected rules of the game. Fieldwork on coyotes, for example, has revealed one direct and immediate cost paid by individuals who fail to engage in fair play or who do not play much at all. Youngsters who do not play much, either because they are avoided by others or because they themselves avoid others, are less tightly bonded to members of their groups. These individuals are more likely to leave their groups and try to make it on their own. But life outside the groups is much riskier than life within them. In a seven-year study of coyotes living in the Grand Teton National Park outside Moose, Wyoming, Marc Bekoff and his colleagues found that more than 55 percent of the yearlings who drifted away from their social group died, whereas fewer than 20 percent of their stay-at-home peers did. Was it because of play? We are not sure. The detailed information we need is

impossible to collect in the field. However, data collected on captive coyotes show that individuals who do not play fairly play less frequently than those who do play fairly. Trouble in play also leads individuals to spend more time alone, away from their littermates and other group members.²⁷

What about humans? All of these tantalizing threads mirror what we know of human responses to inequity. For example, we know that people who feel they are being treated unfairly have a higher risk of developing heart disease. Researchers have speculated that feeling slighted might prompt biochemical changes in the body. Thus, the positive emotions associated with a feeling of being treated fairly likely have deep-seated evolutionary roots. Along these lines, medical epidemiologist Richard Wilkinson notes in his book *Unhealthy Societies: The Afflictions of Inequality* that the most egalitarian countries, such as Norway, tend to have healthier populations than countries in which there are large disparities between rich and poor, such as the United States. He speculates that inequality leads to ill health because of the physiological consequences of social stress.²⁸

Fairness, Trust, and Self-Interest

Primatologist Robert Sussman and ethicist Audrey Chapman note that group living in animals involves compromising individual freedoms and that these compromises can go against self-interest.²⁹ Moving beyond self-interest, in turn, seems to involve trusting others within one's social network. Corporate lawyer Lawrence Mitchell, writing about selfishness and trust in America, says something remarkably similar and raises some points worth considering in our discussion of justice in animal societies. Our comments on Mitchell's ideas are necessarily speculative because there are extremely few data that bear on the question of justice in animals. However, we hope this discussion will stimulate further research.

Mitchell writes: "[a] society of self-interest makes trust difficult if not impossible. . . . [I]t is an ethic that cannot sustain trust. Because it cannot sustain trust, it creates relationships of mutual suspicion and self-protection. It makes it far more difficult to have meaningful and rich interactions with people, at least those outside our immediate families and close circles of friends (and we may be forgiven for being wary even in these relationships)." Mitchell argues that in human societies unfairness breeds mistrust and mistrust creates social instability.³⁰ Is it farfetched to wonder whether the integrity and efficiency of a pack of wolves, a pride of lions, a herd of elephants, or a troop of chimpanzees rest on individuals trusting the intentions of others in the group? No. Trust is essential for maintaining group cohesion. It is important in social play and in reciprocity, both of which foster group living.

Mitchell also argues that fairness is deeply rooted in vulnerability; vulnerability is a normal human condition; we are all vulnerable. "We can start by changing our minds--by changing the ways we think about these issues. We can start by understanding that fairness is all about vulnerability. If we do, we will breed trust. We will breed social cohesion. We will build community."³¹ Are social animals vulnerable in similar ways? We think they are and that understanding the vulnerability of social animals will help us understand more about wild justice.

Philosophizing Justice: Justice Is Not Simply an Abstract Principle

It sounds funny to say that animals can behave justly. This is primarily a reaction to the way justice has been framed in our cultural discussion. It is generally spoken of as a set of abstract principles about who deserves what. And animals, as far as we know, do not think in abstractions.

But morality--including justice--is really not about abstractions, at least not primarily. Robert Solomon writes in *A Passion for Justice*: "Justice presumes a personal concern for others. It is first of all a sense, not a rational or social construction, and I want to argue that this sense is, in an important sense, natural."³² Solomon's point is reflected in our everyday use of language: we often use the phrase "sense

of justice.” This suggests that justice, like empathy, is a sentiment or a feeling, not only, or even primarily, an abstract set of principles.

Paul Shapiro makes a similar point in his essay “Moral Agency in Other Animals.” He writes, “Being able to care about the interests of others is central to what matters in morality, and arguably more important than abstract principles regarding proper conduct.”³³ Caring about the interests of others, and comparing these interests to your own, is the essence of justice.

De Waal, who is typically quite generous in ascribing moral behavior to animals, is more circumspect about justice. When asked in an interview in *Believer* magazine whether animals have a sense of fairness, he equivocates. He admits that animals have moral emotions, including empathy. But, he says, “to get to morality you need more than just the emotions. . . . You need to be able to look at a situation, and make a judgment about that situation even though it doesn’t affect *you* yourself.” You need distance. You need to be able to play the role of what philosophers call the “impartial spectator” and make moral judgments about situations that do not directly affect you. Chimpanzees, de Waal says, do not have a concept of fairness about interactions among others.³⁴

De Waal’s comments remind us of an important truth: Human morality is unique. In human societies, the capacity to think abstractly about who deserves what and why is vitally important. We might view this as a human innovation, a specialization or refinement of the capacity for justice. Justice as expressed in human societies seems more complex and more nuanced than in other animal societies. We do not mean by this to suggest in any way that animals, too, cannot or do not have a sense of fairness.

Skeptics, particularly after reading de Waal’s comments, might object that animals cannot have a sense of justice because they cannot be impartial. Impartiality is a principle of justice which holds that decisions about who gets what are made without bias against race or sexual orientation and without nepotism or other inappropriate preferences. Justice, the saying goes, must be blind. Although impartiality functions as an important principle in certain contexts where justice is in play, these contexts are limited in number and scope. Fairness and justice occupy a much broader place in human social encounters. So, whether or not animals can be “impartial” (which, incidentally, has never been studied) is really irrelevant to the question of whether they have a sense of justice and fairness.

Justice, Empathy, and Cooperation

Justice represents a highly developed and evolved set of animal behaviors, requiring neural complexity and nuanced emotional sensitivity. But it probably rests on the foundation of two other animal behaviors of interest to researchers--empathy and cooperation. Though justice in animals requires empathy and cooperation, it is less often found in species than either of the two behaviors. Clearly, fairness is closely tied to cooperation, particularly more complex forms of cooperation such as reciprocity. Some of the basic behavioral elements of cooperation are also necessary for justice. For example, in cooperative relationships, it is important for one animal to be able to compare its own effort or contribution with that of others in part because there needs to be parity in contribution (parity in both cost and benefit). This capacity to compare--a cognitively complex activity requiring memory of past encounters, expectations about the future, and a nuanced assessment of another animal’s “character”--lies also at the heart of justice.

Trust, essential to cooperative and reciprocal exchanges, also constitutes a basic element of fairness, particularly in the context of social play. Justice behaviors and cooperative behaviors involve punishing cheaters, free riders, and liars and include negative emotions that arise when expectations are not met. Our guess would be that justice and a sense of fairness have evolved out of the more basic repertoire of

cooperative and altruistic behavior. As neuroscientist Antonio Damasio has argued, “It is not difficult to imagine the emergence of justice and honor out of the practices of cooperation.”³⁵

We believe that justice is also rooted in empathy. A sense of fairness clearly requires the capacity to read the intentions and emotional states of others, as do complex forms of cooperation. And, as we have said, animal play involves a constant stream of subtle communications about intentions, beliefs, and desires.

It is possible that research in neuroscience will help elucidate the connections between justice and empathy. Neuroscientists have begun investigating the neural foundations of both empathy and fairness, and some intriguing connections seem to be emerging. A study published in *Nature* by neuroscientist Tania Singer and her colleagues showed that people feel empathy toward those who have treated them fairly in social interactions.³⁶ But this empathic response is not activated or is activated much less strongly toward people who have been unfair. This suggests a close neurological tie between empathy and justice, almost certainly in humans but perhaps also in other species. Justice might also be mediated by mirror neurons. We have noted that mirror neurons may be involved in the sharing of play intentions; also that play is contagious. These intriguing connections call out for further study.

Altruism and empathy may also be intimately linked, both in terms of their evolutionary history and their proximate mechanisms. Social psychologist C. Daniel Batson has proposed that the empathic response is one of the central mechanisms underlying altruistic behavior. There is considerable support among psychologists for what Batson termed his “empathy-altruism hypothesis.”³⁷ Whether or not empathy and altruism are similarly linked in animals remains an open question, but parsimony would suggest an affirmative answer. Empathy, cooperation, and justice seem clearly to weave together into an integrated whole, like different colors and textures of thread in a magnificent tapestry. New research will continue to fill in detail and add depth and nuance to the picture.

Conclusion

Our discovery of the implications of animal play has led us to ponder questions that are not really scientific but rather more philosophical in nature. If animal play indicates that animals really do have morality, how would this change our understanding of ethics within our own species? If morality comes “from nature,” does this make morality somehow less real or less binding? What about those who argue that morality is grounded in religious belief? Do animals have religion too? And aren’t there important differences between our own systems of morality and those found in animal societies?

In this article, we have tried to keep our attention focused on the scientific data supporting our hypothesis that animals have morality. But there are other kinds of questions, philosophical ones that loom behind our hypothesis, and those are vitally important as well. These philosophical implications of animal fairness we address more fully elsewhere, especially in our book *Wild Justice* where we take up the subject in all its manifest complexity.

Notes

1. Denise Gellene, “A Sense of Fair Play Is Only Human, Researchers Find: A Study with Chimps Finds They Are Content with Decisions Humans Would Reject as Unjust,” *Los Angeles Times*, October 5, 2007.
2. Keith Jensen, Josep Call, and Michael Tomasello, “Chimpanzees are Rational Maximizers in an Ultimatum Game,” *Science* 318 (2007): 107.
3. Gellene, “A Sense of Fair Play Is Only Human.”

4. Sarah Boysen in Gellene, "A Sense of Fair Play Is Only Human."
5. Friederike Range, Lisa Horna, Zsafia Viranyi, and Ludwig Huber, "The Absence of Reward Induces Inequity Aversion in Dogs," *Proceedings of the National Academy of Sciences*, <http://www.pnas.org/cgi/doi/10.1073/pnas.0810957105>.
6. Robert C. Solomon, *A Passion for Justice: Emotions and the Origins of the Social Contract* (1995, first published 1990), 141.
7. Ernst Fehr and Simon Gächter, "Fairness and Retaliation: The Economics of Reciprocity," *The Journal of Economic Perspectives: A Journal of the American Economic Association* 14 (2000): 159-81.
8. Helen Briggs, "Babies 'Show Social Intelligence'," *BBC News*, November 21, 2007, <http://news.bbc.co.uk/2/hi/science/nature/7103804.stm>; see also Michael Hopkin, "Babies Can Spot Nice and Nasty Characters," *Nature*, November 21, 2007, <http://www.nature.com/news/2007/071121/full/news.2007.278.html>.
9. Francys Subiaul, Jennifer Vonk, Sanae Okamoto-Barth, and Jochen Barth, "Do Chimpanzees Learn Reputation by Observation? Evidence From Direct and Indirect Experience with Generous and Selfish Strangers," *Animal Cognition* 11 (2008): 611-23.
10. Lee Alan Dugatkin and Marc Bekoff, "Play and the Evolution of Fairness: A Game Theory Model," *Behavioural Processes* 60 (2003): 209-14.
11. Gordon M. Burghardt, *The Genesis of Animal Play: Testing the Limits* (2005).
12. Marek Spinka, Ruth C. Newberry, and Marc Bekoff, "Mammalian Play: Training for the Unexpected," *The Quarterly Review of Biology* 76 (2001): 141-68.
13. Stephen M. Sivy, "Neurobiological Substrates of Play Behavior: Glimpses into the Structure and Function of Mammalian Playfulness," in *Animal Play: Evolutionary, Comparative, and Ecological Perspectives*, ed. Marc Bekoff and John A. Byers (1998), 221-42.
14. Sergio M. Pellis, "Keeping in Touch: Play Fighting and Social Knowledge," in *The Cognitive Animal: Empirical and Theoretical Perspectives on Animal Cognition*, ed. Marc Bekoff, Colin Allen, and Gordon M. Burghardt (2002), 421-27; Kerrie P. Lewis, "A Comparative Study of Primate Play Behaviour: Implications for the Study of Cognition," *Folia Primatologica: International Journal of Primatology* 71 (2000): 417-21.
15. Alexandra C. Horowitz, "The Behaviors of Theories of Mind, and a Case Study of Dogs at Play" (PhD diss., University of California, San Diego, 2002).
16. Marc Bekoff, "Social Communication in Canids: Evidence for the Evolution of a Stereotyped Mammalian Display," *Science* 197 (1977): 1097-99; Marc Bekoff, "Play Signals as Punctuation: The Structure of Social Play in Canids," *Behaviour* 132 (1995): 419-29.
17. Duncan M. Watson and David B. Croft, "Age-Related Differences in Playfighting Strategies of Captive Male Red-Necked Wallabies (*Macropus rufogriseus banksianus*)," *Ethology* 102 (1996): 333-46.
18. Sergio M. Pellis, "Keeping in Touch," 421-27.
19. Charles Darwin, *The Descent of Man and Selection in Relation to Sex* (2000, first published 1871), 69.
20. Jonathan Balcombe, *Pleasurable Kingdom: Animals and the Nature of Feeling Good* (2006).
21. Jaak Panksepp and Jeff Burgdorf, "'Laughing' Rats and the Evolutionary Antecedents of Human Joy?" *Physiology and Behavior* 79 (2003): 533-47.
22. David Sloan Wilson, *Darwin's Cathedral: Evolution, Religion, and the Nature of Society* (2002), 212.
23. Sarah F. Brosnan and Frans B. M. de Waal, "Monkeys Reject Unequal Pay," *Nature* 425 (2003): 297-99.
24. Ibid.
25. Frans B. M. de Waal, *Good Natured: The Origins of Right and Wrong in Humans and Other Animals* (1996), 159; Frans B. M. de Waal, "How Animals Do Business," *Scientific American* 292 (2005): 54-61; de Waal, *Good Natured*, 161.

26. Sarah F. Brosnan, Hillary C. Schiff, and Frans B. M. de Waal, "Tolerance for Inequity May Increase with Social Closeness in Chimpanzees," *Proceedings: Biological Sciences* 272 (2005): 253-58.
27. Marc Bekoff and Michael C. Wells, "Social Ecology and Behavior of Coyotes," in *Advances in the Study of Behavior*, vol. 16, ed. Jay S. Rosenblatt, Colin Beer, Marie-Claire Busnel, and Peter J. B. Slater (1986), 251-338.
28. Richard G. Wilkinson, *Unhealthy Societies: The Afflictions of Inequality* (1996).
29. Robert W. Sussman and Audrey R. Chapman, "The Nature and Evolution of Sociality: Introduction," in *The Origins and Nature of Sociality*, ed. Robert W. Sussman and Audrey R. Chapman (2004), 3-22.
30. Lawrence E. Mitchell, *Stacked Deck: A Story of Selfishness in America* (1998), 205.
31. *Ibid.*, 210.
32. Solomon, *A Passion for Justice*, 102.
33. Paul Shapiro, "Moral Agency in Other Animals," *Theoretical Medicine and Bioethics* 27 (2006): 357-73.
34. Frans B. M. de Waal, interviewed by Tamler Sommers, "Are Humans the Only Species to Have Moral Feelings?" *Believer* 5 (2007), http://www.believermag.com/issues/200709/?read=interview_dewaal.
35. Antonio R. Damasio, *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain* (2003), 103.
36. Tania Singer, Ben Seymour, John P. O'Doherty, Klaas E. Stephan, Raymond J. Dolan, and Chris D. Frith, "Empathic Neural Responses Are Modulated by the Perceived Fairness of Others," *Nature* 439 (2006): 466-69.
37. C. Daniel Batson, *The Altruism Question: Toward a Social-Psychological Answer* (1991).