

## **The evolution of social play: Interdisciplinary analyses of cognitive processes**

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### **The value of social play**

Progress in understanding animal cognition requires interdisciplinary collaboration, among biologists, psychologists, cognitive scientists, neuroscientists and philosophers. In our own case, as a biologist and philosopher, our work has combined empirical and conceptual studies of social play. In this chapter we describe how our personal interests have contributed to our cooperative efforts.

Our work is rooted in a series of long-term empirical studies of social play. When he decided to study social play for his doctoral research, many people told Marc that it was a waste of time for it was impossible to define and many others before had tried to study it and failed. While this provided the perfect challenge for a graduate student who had the full support of his advisor, Michael W. Fox, Marc frankly thought that his research on play would end when he received his degree. He was very wrong indeed.

Social play is a fascinating topic for it combines many elements of cooperation, communication, and learning, (see Pellis, this volume) as well as providing a possible prototype for the evolution of morality (playing fair). According to the social intelligence hypothesis, intelligence is an adaptation for social living (Jolly 1966; Humphrey 1976; Byrne and Whiten 1988), which suggests that social play might be an excellent domain for the investigation of cognitive abilities in a variety of animal species (see also Power 2000; Burghardt 2002).

Marc's main interests have been in what animals do when they play (its structure), the development of play, how they communicate their intentions to play, and what possible functions play may serve -- why play has evolved. The animals he has studied in depth are all members of the family canidae - domestic dogs, coyotes, wolves, foxes, and hybrids. The primary approach has been to take detailed notes while observing animals playing, along with video-taping them for later analysis. These early efforts showed clearly that there were species differences in social play, as well as significant individual differences even among littermates. Individual differences were especially apparent for animals of different social ranks. Sex differences were few. Marc also came to realize that there was something unique about how animals communicated their intentions to engage in, or to continue social play, and became interested in Gregory Bateson's (Bateson 1955) ideas about metacommunication -- communication about communication.

Species differences in social play among canids permit one to study in more detail how play is communicated. First it was shown that a specific play signal, the bow, was highly stereotyped and necessarily so. Detailed measures of the duration and form of bows (Bekoff 1977a) showed that bows clearly were a ritualized action, the result of which was the evolution of a clear and unambiguous signal. There was very little variability in bows and this made sense in that when canids and other animals play they use behavior patterns from various other contexts, namely predation, aggression, and reproduction, and individuals need to know that "this is play and not attempts at predation, aggression, or reproduction."

### **Ethology meets philosophy**

Work on conceptual issues has always run alongside Marc's empirical work. Bekoff and Byers (1981) formalized a well-received working definition of play. Subsequently Marc worked with philosopher Dale Jamieson, who put him in touch with Colin, leading to collaboration on a series of articles on conceptual issues in play, bridging the gap between ethological and philosophical inquiries (Bekoff and Allen 1992, 1998; Allen and Bekoff 1994, 1997).

Philosophical interest in ethology often centers on why it may or may not be scientifically useful and important for ethologists to ascribe meaning and content to animal communication