Group Members in Alphabetical Order

Due Date

ANTHR 1 Section 12345

Annotated Bibliography

**Topic/Question:** Social cognition in dogs and its relationship to understanding the evolution of cooperation in humans

Agnetta, B., Hare, B., and Tomasello, M. (2000). Cues to food location that domestic dogs (*Canis familiaris*) of different ages do and do not use. *Animal Cognition, 3*, 107-112. http://link.springer.com/article/10.1007/s100710000070

Agnetta et al. tested the ability of 16 domestic dogs to use cues provided by humans to find hidden food in 5 different experimental conditions, 4 of which included explicit social cues (gaze) from humans and 1 that did not. The dogs were able to find the food at above chance rates in the conditions that included a behavioral indicator from the human experimenter but were unable to consistently find the food in the absence of a social cue from the human. These results suggest that the domestication process in dogs selected for the ability to respond to human provided cues. The authors also presented a summary of a pilot study in wolves, allowing them to test whether or not this capacity to use social cues from humans is more likely the result of artificial selection during domestication or is a capacity dogs inherited from their wolf ancestors. The wolves were not able to use the social cues from humans as effectively as the dogs, suggesting the capacity to use social cues provided by humans was selected for in the recent evolution of the dog. This paper is relevant to our project because it compares the social cognitive abilities of dogs and wolves.

Hare, B., Brown, M., Williamson, C., and Tomasello, M. (2002). The domestication of social cognition in dogs. *Science, 298*, 1634-1636. doi:10.1126/science.1072702

This study tests the “domestication hypothesis” for the evolution of specialized social cognitive skills in dogs. This hypothesis argues that the social cognitive capacities dogs share with humans, i.e. using behavioral cues from humans, are a result of the domestication process, particularly selection against fear and aggression. Hare et al. present two alternative hypotheses to test, as well: the generalized canid hypothesis, which argues that dogs have these abilities because they are part of the general abilities of the social canids who hunt in packs and must rely on social cues from others and the human exposure hypothesis, which argues that dogs and wolves can both develop these capacities when exposed to humans. The results Hare et al. present clearly support the domestication hypothesis—dogs outperformed wolves in the object choice task presented to them, even those wolves raised by humans. This article is relevant to our project because it presents theoretical and experimental data related to the evolution of cognitive differences between dogs and wolves.

Hare, B. and Tomasello, M. (2005). Human-like social skills in dogs? *TRENDS in Cognitive Science, 9*(9), 439-444. doi:10.1016/j.tics.2005.07.003

This review article summarizes several of the leading hypotheses regarding the evolution of the specialized social cognitive skills dogs possess and argues that studying the domestication of the dog has an important role to play in understanding the evolution of cooperation in humans (convergent evolution). Hare and Tomasello report that the special cognitive abilities dogs possess appear to be the result of selection against fear and aggression in their wild wolf ancestors, which has the power to shed light on how and why humans are able to cooperate in ways that one of our closest relatives, the chimpanzee, cannot. Humans cooperate to a greater degree than any other non-insect species and this cooperation requires a decrease in intra-group competition and aggression, which appears to be part of why chimpanzees cannot cooperate as effectively as humans. This article is relevant to our topic because it provides a crucial theoretical framework for understanding what makes dogs and wolves different and how understanding the evolutionary process that led to those differences may have also acted similarly in human evolutionary history.

Mech, L.D. (1981). *Wolf: The behavior and ecology of an endangered species*. Minneapolis, MN: University of Minnesota Press.

This book provides a broad overview of the behavior and ecology of wild wolves. The sections on social order, communication, and family life, will be most useful for this project in helping me establish a baseline understanding of wolf behavior. Wolves are cooperative breeders and live in small family packs in which all individuals participate in the feeding and care of pups. Since wolves live in social groups, they have evolved complex communication and social behaviors in order to share information and regulate group life. At the time of writing, Mech points out that little was known about the intelligence of wild wolves but that it is apparent that they are highly adaptable animals able to learn from changing circumstances. The fact that wolves are social animals means that they are predisposed to paying attention to behavioral cues from other members of their group, which is directly related to the present project.

Packard, J.M. (2003). Wolf behavior: Reproductive, social, and intelligent. In L.D. Mech and L. Boitano (Eds.), *Wolves: Behavior, ecology, and conservation* (pp. 35-65). Chicago: University of Chicago Press.

Packard explicitly engages the question of the evolution of wolf intelligence in this chapter. She discusses the two primary hypotheses for the evolution of intelligence in animals—that intelligence was favored in animals that had to adapt to a changing environment or changing resources and that intelligence was favored in animals living in social groups due to their continuous need to adapt to and understand the relationships between other individuals. Wolves are highly social animals and all members of the pack participate in caring for the pups, even if they are not related to others in the pack. Wolves have to learn how to live in their social group and hunt successfully as a pack, which means that they have evolved the ability to pay attention to the behavior of others. This chapter will be very useful for the current project as it expands on the evolution of wolf intelligence that Mech started developing in his earlier work. Wolves, like dogs, are predisposed to understand behavioral cues from conspecifics but the question being asked here is looking at whether or not that ability in wolves has been passed on wholesale to their descendants and later recruited for interactions with humans or whether the unique evolutionary history of the dog has led to their enhanced capacity to pay attention to behavioral cues from humans.

Viránya, Z., Gácsi, M., Kubinyi, E., Topál, J., Belényi, B., Ujfalussy, D., and Miklósi, Á. (2008). Comprehension of human pointing gestures in young human-reared wolves (*Canis lupus*) and dogs (*Canis familiaris*). *Animal Cognition, 11*, 373-387. doi:10.1007/s100071-007-0127-y

This study presents results of a series of experiments comparing the ability of dogs and wolves to follow gaze and pointing cues from humans in an effort to test why and how their abilities might differ. The results demonstrate that dogs are better at following pointing and gaze cues from humans in general but that wolves raised by humans and given intensive training are able to develop some skills in following human cues, although the humans must be very close to the food reward and the wolves must have received formal training, whereas dogs do not require such training. Viránya et al. did report, however, that there was significant individual variation among the wolves and suggested that this variation may have provided the raw material for selection in the domestication of the dog.