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Anthropocentrism and the Study of Animal Language

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In the 17th century, Descartes asserted that language was proof that humans alone have souls (Descartes, 1649/1927; Radner & Radner, 1989). This anthropocentric view of language has its philosophical roots in Descartes's notion of the relationship between the human body and the human mind. Descartes thought that the human body was analogous to an automaton, a machine that mechanically performed particular tasks. The human mind was separate from the body, the "Ghost in the Machine" (Ryle, 1949, pp. 15–16), and provided the body with a spark of consciousness. Human thought came from the mind, and was translated by the body machine into action. Nonhuman animals did not have a mind, but were instead merely unthinking automatons. What clinched this difference between human and animal, according to Descartes, was language: animals could never use words or other signs to convey any thoughts to others (Radner & Radner, 1989).

The assumption that language is a necessary condition of thought, and that both are exclusive properties of the human species, became a prevalent view among philosophers such as Hobbes, Herder, Wilhelm von Humboldt, and Hegel (Waldron, 1985). Linguists, biologists, and philosophers assume that language is what distinguishes the human species from other animals (Keyan, 1978; Crook, 1980; Chomsky, 1982; Waldron, 1985), and linguistics texts warn against assuming that animal communication and human language are even remotely analogous systems (e.g., Akmajian, Demers, & Harnish, 1985). Of all human capabil-

ities, language remains *the* difference separating human beings from other creatures.

In an attempt to make clear what is specific to human language and what is present across species, Hockett (1960) developed a list of the design elements of human language that could be used to compare species' abilities (Thorpe, 1972, 1974a). Some of these elements are purely physical, dealing with the auditory channel and the mechanism of the transmission itself (Hockett & Altmann, 1968), such that they can be applied to a wide variety of vocal communication sources. Other elements relate specifically to aspects of human language: arbitrariness, semanticity, displacement of the message from an immediate place or time, syntax, and openness (where new messages are easily coined). Still other elements involve the ability to reflect upon, teach, and learn the communication system, and to use it to deliberately deceive the recipients of the signals.

Although implicit in Hockett's analysis is the expectation that particular attributes are present solely in the human domain, it is inappropriate to assume without evidence that the communication systems of other species cannot share elements of human language (Lieberman, 1975). According to Lieberman, failure to find syntax and other seemingly uniquely human elements in animal communication occurs because we do not ask the right questions. For example, many researchers attempt to define one single meaning of a particular animal signal by studying all the behavioral situations in which it occurs, and assigning a meaning based on something common to all these situations. The same method applied to human communication would lead to wholly inadequate results:

> If we looked for the common "meaning" that could be associated with most human vocal communications we would have to conclude that speech perhaps was a means whereby humans located each other—in other words, that one human made noise and the other human made a return noise. (Lieberman, 1975, p. 25)

Thus, it may be the methods of studying animal communication systems which are limited, rather than the communication systems themselves.

Recent findings have chipped away at the view that only humans have the cognitive capabilities for language (Parker & Gibson, 1990; Griffin, 1992). Other species have shown capacities for communicating using methods that contain some of the elements of human language. For example, some chimpanzees taught gestures of American Sign Language (ASL) communicate with these signs, as well as teach them to

young (Fouts, Fouts, & Van Cantfort, 1989). In addition, chimpanzees and other primates taught ASL can assign at least two different semantic referents to a particular word, and differentiate those meanings through an application of syntax (Fouts, 1973; Gardner, Gardner, & Van Cantfort, 1989).

Even with the evidence of gestural abilities in apes, human uniqueness theorists such as Bickerton (1990) continue to argue that human language cannot have evolved directly from animal communication because the two systems are too different. Although animals as diverse as vervet monkeys (Cheney & Seyfarth, 1990), chickens (Gyger, Marler, & Pickert, 1987), and prairie dogs (Slobodchikoff, Kiriazis, Fisher, & Creef, 1991) can distinguish different types of predators and encode such information in their alarm calls, according to Bickerton these calls are limited to items that are directly relevant to animals' everyday experience, whereas human language can express ideas that are far beyond everyday experience. Even though alarm signals such as those produced by vervet monkeys can be used to identify the presence of an eagle or python (Cheney & Seyfarth, 1990), it is argued that these alarm calls cannot be broken down into parts the way that human sentences can (Bickerton, 1990).

Yet the information content of naturally occurring animal signals *can* be elaborately coded and structured in ways comparable to human sentences, but these comparisons need to be hypothesized explicitly rather than denied if they are to be discovered. For example, Gunnison's prairie dogs have demonstrated the ability to distinguish between individuals within a predator category, as evidenced by differences in their alarm calls (Slobodchikoff et al., 1991). These differences within a predator category appear to represent descriptors of the general size and shape of a predator, and with human predators, the color of clothes that each individual human is wearing. Prairie dogs seem to make cognitive assessments of the imminence of danger, and their alarms seem far more than just unintentional expressions of fear (cp. August & Anderson, 1987; cf. Morton, 1977).

While a calling animal might indeed produce something comparable to a sentence, its syntax and grammar might be unrecognizable to us because it evolved along a totally different pathway. If, as studies of alarm calls in prairie dogs have demonstrated, the semantic content of the call is generally descriptive and is given with the intent to communicate information about a predator, the possibility exists that such calls could include the syntactical construct of an actor or agent (perhaps a particular predator), a recipient (either the group or a specific animal that has been targeted by the predator), and an action indicating the

type of attack (Slobodchikoff et al., 1991). If the animals can also encode information about the imminence of danger ("NOW!" or "Pretty soon"), perhaps this can be assigned, within the context of that species, a tense, according to some rule analogous to our rules of grammar. The precise forms of semantics, syntax, and grammar may be constrained by the ecological and evolutionary limitations of a particular species.

Testing for these ideas can be very difficult because, once again, we work from our anthropocentric need for a lexicon, or meanings encoded into discrete entities called words. Isolating such a lexicon in other animals might be impossible if we are not aware that their perceptions of their world, how they receive sensory information and interpret it, may be beyond the grasp of our senses. Animal language may elude our understanding because it encodes information about things and relationships beyond the realm of our immediate perceptual abilities.

Indeed, the evolutionary origins of human language itself are obscure. Some reconstructions of the vocal tracts of early hominids suggest that only some species had the bent supralaryngeal vocal tract that would have allowed them to physically produce the majority of sounds used to encode human speech (Lieberman, 1975); others suggest that there are no fundamental differences in the vocal tracts of mammals in general, and that the capacity to produce spoken language is due to differences in cerebral development (Wind, 1989). The evolution of tool use, the use of fire, bartering, social and kinship structures, and life in riparian habitats have all been suggested as possible factors leading to the evolution of language (Parker & Gibson, 1979; Grolier, 1989; Morgan, 1989).

Such explanations make a key assumption that human language adapted through ecological constraints. For language to evolve, it must have facilitated an understanding or manipulation of the world in ways that humans could exploit to increase their fitness (Dawkins & Krebs, 1978). Socioculturally, language might have empowered members of groups to deal more efficiently with changes in their environment, and to share this information with their kin. It also might have allowed some individuals to have power over others. Additionally, the complex patterns of behavior associated with early human culture, such as tool-making, hunting, and gathering of plant products, might have placed a selective advantage on linguistic systems that enhanced transmission of knowledge about these skills (Parker & Gibson, 1979; Crook, 1980). Without the needs of adjusting to changing ecological conditions within the context of a social system, there might have been little use for an elaborate vocalized communication system.

These ideas about the evolution of human language have implications about animal languages. If we try to keep an open mind about differing design features of animals that live in different ecological circumstances, we may find that many more species than we currently recognize have a language that has evolved to meet their specific needs, just as our language has evolved to meet our own ecological needs.