

## **DE-CODING THE EVOLUTION OF COMMUNICATION: HOW THE CODE MODEL SYSTEMATICALLY BIASES STUDIES OF ANIMAL COMMUNICATION**

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Humans have highly-developed ostensive and inferential capacities, such that virtually any behavior can be used as a communicative signal (Sperber & Wilson, 1995; Origgi and Sperber 2000; Scott-Phillips, 2014). Some authors propose that these capacities make human language different *in kind* from other primate communication systems and, indeed, from animal communication more broadly (e.g., Scott-Phillips, 2014, 2015). According to Scott-Phillips, primate communication relies on “natural codes” (ones that derive their meaning largely through inheritance), while human language relies on “conventional codes” (ones that derive their meaning through learning and convention). However, this characterization of human language as infinitely flexible and expandable and primate communication as largely inflexible and fixed does not take into account the great difference in methodological approaches to studying primate communication and human language.

Any primatologist will tell you that primates interact in many complex, difficult-to-measure ways. The trick is trying to capture that complexity in an operationalizable, repeatable way so that it can move from anecdote to data. Animal communication research is built around searching for replicable contingencies between a signal given by one individual and a subsequent change of behavior in another. Or, for signals that reference things in the world (like predators), a contingency first between an eliciting context and a signal and then between that signal and the response. This search for animal signals is strongly shaped by the “code model”, which grew out of the Shannon model of information (Shannon 1948) and the conduit model of information transfer (Reddy 1979). This metaphor has had a lasting effect on research design, exaggerating the gap between human language and primate communication.

Studies of primate communication find codes. But this is unsurprising, since studies of primate communication are *looking for* codes. To put it another way, the conclusions are largely built in to the methods. In this talk, I use studies of ape gesture and vocalization as example cases to highlight the ways in which characterizations of ape communication systems are strongly influenced by the underlying assumptions of the code model, which influence data collection and analysis. While studies are designed to identify signal-meaning pairs, selective data practices and publishing biases also contribute to characterizing primate communication as codes. For example, in ape gesture studies, datasets are typically narrowed down considerably to include those that are likely to show predictable associations.

It is unsurprising that animal communication literature focuses on these predictable elements. They are the most replicable, they can demonstrate that a signal has meaning, and they can reveal some of the properties of human language (i.e., reference). The assumptions of this model are insidious. In a recent article co-authored by some of the biggest names in animal communication, the authors urge the field to adopt a standardized definition of intentional communication that avoids mental-state attribution. But even this definition revolves around observing code-like contingencies in signals and responses (Townsend et al., 2017). It may be impossible (or even undesirable) to eschew searching for clear contingencies between signals and responses, but we should be cautious when concluding that a species' communication system is primarily a code when that is what we have looked for.

Comparative studies across primate species have great potential to reveal the homologous features of communication and cognition that gave rise to language in the human lineage. But, in seeking to characterize the differences between human and non-human communication, it is critical that we do focus our search too strongly on identifying simple codes, lest we discover only those. The theory that human communication is built on a framework of ostension and inference is compelling, but to determine whether humans are unique in these abilities, we must assess the lasting impact of the code model framework on studies of animal communication and ensure that our conclusions are not driven by differences in our methods.

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