NONHUMAN ANIMALS' USE OF OSTENSIVE CUES IN AN OBJECT CHOICE TASK

HEIDI LYN[1], STEPHANIE JETT[2], MEGAN BROADWAY[1], AND MYSTERA SAMUELSON[1]

Department of Psychology, University of Southern Mississippi, Long Beach, MS, USA
heidi.lyn@usm.edu

Department of Psychology, University of South Alabama Mobile, AL
sjett@southalabama.edu

One recent argument concerning the evolution of language centers on the ability of the last common ancestor of apes and humans to engage in Gricean communication (that is, communication in which the speaker has the clear intent to produce a response, but also with the intent that the hearer can recognize the communicative intent of the speaker (e.g. Moore, 2015; Scott-Phillips, 2015; Tomasello, 2008). The *standard* argument (see Moore, 2015) has been that true Gricean communication requires fourth-order meta-representation (the speaker intends for the hearer to understand that the speaker intends for the hearer to understand the message) and is therefore unique to humans. In this conception, animal communication is limited to strict associations (coded communication) and Gricean or ostensive communication was the key innovation in the evolution of language.

An *alternative* view suggests that the representation required for ostensive communication is much simpler (see Moore, 2015 for an explanation) – the speaker intends to communicate a message to the hearer and the speaker also intends for that message to represent something in the world (two first-order meta-representations). On the receiving end, then, the hearer must both understand that the speaker is intending to communicate (through overt or covert intentional cues) and must decipher the message (the signal). The intent to

communicate would itself be communicated through an ostensive act or cue – an act designed to draw attention to and facilitate the receipt of a communicative signal. Ostensive cues can include eye contact and shifting of joint attention, among other behaviors. These ostensive cues remain separate from the communicative signal, which could include gestures, verbalizations, etc. Under the standard view, nonhuman animals should rely entirely on associative learning to follow a signal such as pointing. In this scenario, nonhumans should perform at the same level when a communicator uses ostensive cues as when those cues are eliminated.

To evaluate this theory, we tested 3 bonobos *(Pan paniscus)* from the Ape Cognition and Conservation Initiative (ACCI) in Des Moines, IA on the object choice task (point following) both with and without ostensive cues (in this case, ostensive cues included gaze alteration between the gesture and the recipient). When ostensive cues were removed, the apes' performance fell from almost perfect to chance levels, indicating that ostensive cues are vital for the performance of bonobos in this task ($p<.01$, binomial tests).

A new study has been initiated with domestic dogs *(Canis familiaris)* at the Humane Society of South Mississippi in Gulfport, MS. A total of forty dogs will be tested on a variety of ostensive cues to determine which if any are most salient. To date, twenty-five dogs have begun testing, but only twelve passed the initial evaluation of following eye gaze. Of those twelve, eight could follow a distal point, but only two could follow a cross-body point (required for our study). In this stage, the ostensive cues tested were gaze alterations among the three points of the joint attention triad – gesture and recipient, gesture and referent, and recipient and referent. Neither dog could follow points with all ostensive cues removed, although one had no difficulty when alteration to any one point of the triad was eliminated (e.g. eye gaze only moved between gesture and recipient, but not to the referent).

These findings strongly indicate that nonhuman animals utilize overt ostensive cues to recognize gestural communication from humans, suggesting that the development of ostensive cues was not the key innovation that triggered the evolution of human language. Rather, the dog data reinforce the likely crucial social component of gesture comprehension in nonhumans, as the dogs in this study almost certainly had less human interaction and performed less well than pet dogs in other studies, again indicating more than strict associative learning.

References

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