

# **A POINT IS NOT A POINT IS NOT A POINT: RE- INTERPRETING THREE BASIC KINDS OF POINTING COMPREHENSION**

HEIDI LYN\*<sup>1</sup> and JENNIE CHRISTOPHER<sup>1,2</sup>

\*Corresponding Author: [hlyn@southalabama.edu](mailto:hlyn@southalabama.edu)

<sup>1</sup>Department of Psychology, University of South Alabama, Mobile, AL USA

<sup>2</sup> Department of Psychology, University of Southern Mississippi, Hattiesburg,  
MS USA

The comprehension of human points has been a topic of debate over many years for those studying language evolution. Pointing is seen as a precursor behavior to referential communication and as such as a potential focus for comparative studies. Unfortunately, because humans seem to comprehend all pointing types as similarly referential, many researchers assume that animals similarly treat all points as the same. Therefore, many studies treat all point types as equally interesting and important for studying language evolution, although there is considerable evidence that suggests otherwise (see Lyn, 2010; Mulcahy & Hedge, 2012; Osborne & Mulcahy, 2019 for examples). Such methodological imprecision confuses categorically different concepts and can muddy the interpretive waters and inhibit scientific progress (e.g. Clark, Elsherif, & Leavens, 2019). We suggest here and will provide preliminary evidence that only one of the many types of human points is valuable for comparative study of communicative processes, and human language evolution in particular. Further, we suggest that only one hypothesis regarding nonhuman comprehension of this point – what we are calling the Social Interaction Point Hypothesis – explains the data so far collected.

To illustrate our framework, we will present and compare new and published canine and ape performance on three main point types, specifically as tested within the object-choice task, in which the participant is presented with an array of options, the correct choice being indicated by a point:

Proximal-Proximal (PP): The choice items are close together and the point is close to the correct item – usually within a few inches.

Proximal-Distal (PD): The choice items are close together, but the point is further away – usually more than 10-12 inches (also called Abject Object Choice (Mulcahy & Hedge, 2012))

Distal-Distal (DD): The choice items are further apart (usually more than 3 feet), and the point is therefore necessarily further away.

There are further complications to pointing behavior, such as ipsilateral vs contralateral pointing, asymmetric pointing, etc. But our framework neatly encompasses the current findings from those point types as well.

Our data, as well as the preponderance of evidence from the past 20 years of pointing studies, suggest that both PP and DD point following can be explained by simple social learning or by associative learning mechanisms and therefore do not require the subjects to recognize the communicative nature of the gesture. Specifically, researchers over the past 20 years have shown that when the pointing gesture is proximal to the item, the only mechanism required to successfully complete the task is stimulus enhancement (Osborne & Mulcahy, 2019; Povinelli, Bierschwale, & Čech, 1999). Similarly, our data supports earlier findings show that DD point following can be achieved by simpler mechanisms, such as associative learning or simple heuristics (Call, 2001; Miklosi & Soproni, 2006; Povinelli, Bierschwale, & Čech, 1999).

In contrast, the PD points are likely the only point types that require triadic perspective taking and an understanding of the communicative nature of the point, which explains the decreased success in our apes and dogs as well as supporting the findings of other researchers in apes (e.g. Clark et al., 2019; Leavens, Hopkins, & Bard, 2005). Therefore, to any researcher interested in exploring the potential for point following as a precursor to language, the PD point types are the only types of interest.

This framework explains why many attempts to place point following within the framework of human language evolution have failed. The domestication hypothesis (Hare et al., 2010), for instance, failed to account for systematic methodological differences across species. The mechanistic perspective (see Povinelli, Bierschwale, & Čech, 1999) failed to note that PD point forms (and a few others) do not allow for non-communicative learning mechanisms. Instead, the data on communicative points all support one conclusion: the best predictor of success is human social contact. We and others have reported, but not formalized this more accurate representation of the data, what we suggest calling the Social Interaction Point Hypothesis (e.g. Lyn, Russell, & Hopkins, 2010; Udell, Spencer, Dorey, & Wynne, 2012). This hypothesis, is also scientifically preferable because instead of separating communicative points as an anomalous gesture, it returns them to the context of the evolution of gestural communication more broadly defined.

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