Do Dogs Really Get the Point?

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Over the past two decades, researchers have discussed the seeming anomaly of dogs' ability to follow human pointing gestures more successfully than great apes or wild canids and have suggested these findings were due to domestication instilling a biological capacity to communicate with humans (e.g. Hare at al., 2010). Other researchers, however, found that some wild species do follow points at similar rates to domesticated dogs, challenging initial biological theories in favor of human interaction or learning theories (Udell Dorey, & Wynne, 2008). Similarly, some studies have found that variations in point type and the presence or absence of ostensive cues can greatly affect the success of point following (Lyn, et al., 2021). These findings call into question the communicative nature of canine point following and its potential connection to language evolution. To investigate these and other questions, we initiated a meta-analysis of the over 20 years of dog pointing studies.

A total of 146 peer-reviewed articles were included in the initial analysis, collected from wide-ranging database search using the keywords: point, pointing, cues, gesture, communication, dog, canine, distal, proximal, ostension, human gesture, communicative, and object-choice task. This study focuses on a data set of 55 articles that included individual data for the dogs, comprising 1465 individual data points, of which 1173 were pet dogs, 113 were a wild canid species (wolf, fox, etc.), 94 were research dogs and 85 were shelter dogs. Dogs were relatively evenly split between males and females (649 males, 665 females, 151 unrecorded). Average age was 2.47 with over 1/3 of the dogs under 7 months.

Contrary to many earlier studies, our meta-analysis found no systematic differences between wild canid species and domesticated dogs, instead, the only group that was different to all other groups was shelter dogs, who performed

more poorly than every other group ($F(3, 186) = 15.5$, $p<001$, Games-Howell post-hoc test $p<.003$ for all comparisons with shelter dogs).
The dogs' known socialization history with humans did have an effect on pointing comprehension, but not for typical amounts of socialization (regular pet interactions), dogs only performed better if they were recorded to be in contact with humans constantly ($F(3, 178)=5.63$, $p=.001$). Dogs did seem to learn to follow points quickly; percentage of points correct was positively correlated with the number of trials the dog completed ($r=.12$, $p<.001$, maximum number of trials = 30). Notably, our data show that dogs react differently depending on the type of point on offer and the ostensive cues that are present ($F(1, 1461) = 53.3$, $p<.001$). Dogs follow ipsilateral (same side) points equally well with and without a gaze cue, but responses to contralateral points fall to chance levels without gaze cues.

Our results suggest that dogs don't comprehend points as a communicative mechanism, rather they likely learn to follow points primarily through associative mechanisms such as location of movement or distance between gesturing arm and object. When those cues are removed, as when the gesture crosses the researchers' bodies, the dogs fall to chance levels, unless another cue is added. Further, the domestication process does not seem to confer any benefits onto dogs that wild canids did not already have. Constant interaction with humans did seem to increase point following, suggesting a strong learned component. Future research must first and foremost avoid presumption of communicative mechanisms when interpreting dogs point following, and carefully analyze any suggested links to language evolution.

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References

Hare, B., Rosati, A., Kaminski, J., Bräuer, J., Call, J., & Tomasello, M. (2010). The domestication hypothesis for dogs' skills with human communication: A response to Udell et al. (2008) and Wynne et al. (2008). Animal Behaviour, 79(2), e1–e6..

Lyn, H., Broadway, M., Jett, S. E., Samuelson, M. M., Christopher, J., & Chenkin, B. (2021). The effects of distance on pointing comprehension in shelter dogs. *Animal Cognition*, *24*, 855-865..

Udell, M. A. R., Dorey, N. R., & Wynne, C. D. L. (2008). Wolves outperform dogs in following human social cues. *Animal Behaviour*, *76*(6), 1767–1773.