Border collie comprehends over 1,000 object names

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Researchers at Wofford College discovered that a Border Collie comprehends the names of over 1000 objects, differentiating between names of objects and orders to fetch them. This research deepens the findings of researchers in Germany, who had discovered a dog that knew the names of a couple of hundred objects. Important questions were left open as to how far a dog could go, and whether the dog really understood that the object names were nouns and not commands to retrieve the object.

John Pilley and Alliston Reid answered two central questions with their research: How large can a dog's vocabulary become if given extensive training? What do dogs actually understand when we use human language to communicate with them? These findings are published in the Elsevier journal *Behavioural Processes* .

The authors demonstrated that their dog, Chaser, learned the names of 1022 objects - no upper limit is apparent - they stopped training the dog after three years due to their time constraints, not because the dog could not learn more names. This study demonstrates Chaser's ability to learn the names of proper nouns, and her extensive vocabulary was tested repeatedly under carefully controlled conditions. The authors admitted that she remembered the names of each of her 1022 toys better than they could. Chaser's ability to learn and remember more than 1000 proper nouns, each mapped to a unique object, revealed clear evidence of several capacities necessary for learning receptive human language: the ability to discriminate between 1022 different sounds representing

names of objects, the ability to discriminate many objects visually, an extensive [vocabulary](#), and a substantial [memory](#) system that allowed the mapping of many auditory stimuli to many visual stimuli.

Their second experiment demonstrated that Chaser really understands that these are names, and not commands to fetch the object. In order to test independence of meaning of nouns and commands, the authors randomly combined nouns with commands to see if Chaser would produce the correct behavior toward the correct object in each trial. Without special training, Chaser responded to each combination correctly, even on the first trial, demonstrating that Chaser understood that the commands and proper-noun names had independent meanings. The dog understands that names refer to particular objects, independent of the action requested involving that object.

Their third experiment demonstrated that the dog also understands names for categories of objects or common nouns, and not just individual names or proper nouns. For instance, she learned that name "toy" referred to the 1022 objects she was allowed to play with, each with a proper-noun name. By forming categories represented by common nouns, Chaser mapped one label onto many objects. Chaser also demonstrated that she could map up to three labels onto the same object without error. For example, Chaser knew the proper-noun names of all objects used in the research. Chaser also mapped the common noun "toy" onto these same objects. Her additional success with the two common nouns "ball" and "frisbee" demonstrates that she mapped a third label onto these objects. Her demonstrations of one-to-many and many-to-one noun/object mappings reveal flexibility in the referential nature of words in border collies.

Each of these experiments showed that the dog could learn names using procedures involving associative learning. Their fourth experiment demonstrated that Chaser could also learn names by exclusion - inferred

the name of a novel object by exclusion of familiar already-named objects. Retention of these names using this procedure was limited to short periods, however, just as usually observed with children.

According to Alliston Reid, "This research is important because it demonstrates that dogs, like children, can develop extensive vocabularies and understand that certain words represent individual objects and other words represent categories of objects, independent in meaning of what one is asked to do with those objects."

Additional research is needed to determine whether these impressive language abilities are shared by other breeds of dogs. This work encourages research into how the historical relationships between humans and dogs may have influenced the abilities of dogs to communicate with humans, and whether this influence is unique to dogs.

  More information: "Border collie comprehends object names as verbal referents" by John Pilley and Alliston Reid. dx.doi.org/10.1016/j.beproc.2010.11.007

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