The Extent of Humanness in "Human-like" Animal Communication

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1 Introduction

The ability to use language for communication is one of the defining features that distinguish human behaviour as exceptional from that of other organisms in the Animal Kingdom. However, although many researchers are far from fully comprehending the various forms of animal communication, they have found that due to the diversity of animal intelligence, plenty of animal communication can be human-like too. This blurs the lines between how humans and other animals communicate among themselves. I will review research done into the communication of two groups of animals; cetaceans and primates, to determine to what extent their communication is similar to humans and what features are lacking that prevent their forms of communication from being considered a human language. I will also address the issue of applying categorical differences to set human language and animal communication apart.

2 Hockett's Design Features

Before looking into literature on whale and primate communication, I would like to clarify that there has been some research into differentiating human language and animal communication. One such research endeavour is Charles Hockett's (Hockett, 1960, 1973) features of what human language and animal communication both have and do not in his investigation on the origin of language and linguistic universals. As part of a categorical approach, the features would be later known as Hockett's design features. Hockett identified up to sixteen features in his initial writings and then noted the following seven features which unlike the previous ones, are mostly exclusive to human languages:

- displacement (communicating about something that cannot be sensed right now),
- productivity (constantly creating novel utterances spontaneously from an existing set of known utterances),
- duality (being able to combine smaller, usually meaningless units of language to form larger, more meaningful units),
- cultural transmission (language is not genetically acquired but has to be acquired and passed down from others),

- prevarication (using language as opposed to innate biological functions to deceive others),
- reflexiveness (using language to talk about language), and
- learnability (all human languages can be learned by any other human).

Despite this, the notion that virtually no animals have some of these features is challenged by later research on the communication systems of various animals and attempts to have primates acquire human sign language, since they do not have the biological capabilities for human-like speech.

3 Cetacean communication

As the largest known group of animals, the Cetacea family possess brains large enough for exceptional intelligence compared to other animals. While they are not as intelligent as humans, their intricate communication systems suggest a decent amount of intelligence by possessing (to some extent) several Hockett human-exclusive design features. To start off, Rendell and Whitehead (2005) identify communicative variation in sperm whales hailing from different parts of the world's oceans. They find that communicative variation not only comes from genetic variation and geographical adaptation, but also from cultural change and the need for recognition by other whales, reflecting different social structures. Thus sperm whales have what is known in human language as "dialects". The identification of whale "dialects" is strengthened by their stability over time. Right away, this implies that whale communication has the Hockett design feature of cultural transmission. Furthermore, it is even possible for humpback whales of different populations to exchange knowledge about their different vocalisations (Helweg et al., 1998).

If this is a sign that cetacean communication may have productivity, research by Filatova et al. (2016) indicate that killer whales are limited by physical constraints in their vocal production mechanisms, hampering their ability to produce completely random vocalisations. Even if there are seemingly random vocalisations, they happen to recur in completely different populations. Therefore, cetacean communication does not have full productivity. Research into the informational structure of humpback whale vocalisations conducted by Suzuki et al. (2006) confirms the hypothesis that vocalisations are made up of hierarchical units, paralleling the human language hierarchy of phonemes, morphemes, words and so on. The sequencing of the songs would form a rudimentary syntax. This implies that humpback whale communication not only has discreteness but also duality, the latter another allegedly human-exclusive language feature. However, the researchers note that there is a likelihood that the structure is meaningless based on the information in it. I believe this sets a good precedent for examining animal communication more thoroughly for any semblance of structure or syntax, which may be signs of the duality design feature.

Although it is clear that cetacean communication possesses plenty of features that are supposedly exclusive to human language, one feature I am yet to find researched is prevarication and displacement, i.e. whether whale songs can be used for deception and informing of objects

that whales cannot sense. Fully understanding whale communication is the limit at this point, with Rendell admitting himself in an interview that "a single marine mammal communication call where its function has been unambiguously decoded" (quoted in Fearon (2018)) would be impossible. This is crucial in pointing out that researchers of whale communication have yet to confirm whether it possesses the features of reflexiveness and learnability. They go hand-in-hand: we are far from understanding if whales can use whale songs to talk about whale songs since we cannot fully decipher and acquire whale communication. Doing so could help us to understand if whales are capable of prevarication too.

4 Primate Communication

Research interest in primate communication in relation to human language has been high given how evolutionarily related primates are to humans. Of particular note are the numerous attempts to train primates to acquire human sign languages or symbols since the hand-related faculties of primates exceed their speech faculties in communicative potential. For example, Premack and Premack (1983) taught chimpanzees how to communicate with plastic pieces standing in for English words. One of the subjects, 'Sarah' was able to access the features of duality and displacement through the tokens, by stringing simple sentences and conditional statements from them to ask for fruit which was not in front of her. Another famous example of a primate learning sign language is Koko the gorilla. She was able to demonstrate prevarication by falsely claiming her pet kitten destroyed a sink in her enclosure through sign language (Brooks, 2018). Natural prevarication is possible with chimpanzees too when they are forced to behave competitively, as discovered by (Woodruff & Premack, 1979). Analysing the vocalisations of other primates also proves that they have some duality. Putty-nosed monkeys and Campbell's monkeys for example construct structured calls based on predators they spot, the former sequencing their calls and the latter affixing calls based on the predators they spot (Arnold & Zuberbühler, 2006; Ouattara et al., 2009). Once again, this is another case of animal communication exhibiting design features allegedly reserved for human language.

Sign language may be a breakthrough in primate language cognition yet realising the feature of productivity – even with sign language – is much debated . To educate primates about the limitless possibilities of syntactic permutations, – this crucial sign of productivity turned out to be a bust as the increased hierarchical logic escaped cotton-top tamarins tested by Fitch (2004). If monkeys cannot understand grammar that arises from very sophisticated syntax, then it is no wonder there has yet to be a breakthrough with sign language. Monkeys are highly unlikely to fully utilise human sign language taught by their trainers, let alone develop a rich gesturing system on their own as humans do. Take for example the rapid, spontaneous development of Nicaraguan Sign Language in the Nicaraguan Deaf community, derived from existing sign languages and home signs.

While unsuccessful in producing primates capable of mastering human language, there is some merit in studying how they acquire human sign language since the evolution of human language is theorised to have started from gestures (Cooperrider, 2020). It could thus provide some insights into the beginnings of how humans came to acquire language as we know it.

5 Limitations of Hockett's Design Features and a Modern Alternative

After looking into the examples of cetacean and primate communication, the shortcomings of Hockett's design features become evident: cetaceans and primates could exhibit features claimed to be exclusive to humans to varying extents. Although they set a decent benchmark for its time for classifying human language, research after that conveys the datedness of Hockett's categorical approach. Wacewicz and Żywiczyński (2014) challenge Hockett in two ways: Hockett has overfocused on both communication being oral and messages as being transmitted by codes rather than recognising the role that cognition plays in such communications. While not directly related to the categorical problem, these issues the two researchers bring up compound the problem in animal communication since animals are claimed to have limited cognitive capabilities based on their means and codes of communication. In my opinion, to say that animal communication is limited by lacking several human language features ironically hampers our understanding of animals and exactly how they communicate and makes it difficult to figure out the threshold for making human language special.

Decades after Hockett first laid out his design features, Hauser (2002) argued for a broad and narrow sense approach to human language; the broad sense encapsulates various cognitive systems required for language and the narrow sense represents the sole capability of recursion. Among several hypotheses, they believe recursion is the only exclusive to humans and acknowledge a continuity in differences between animal communication and human language in the broad sense. This shows, moving forward, that it is important to consider animal cognition while researching how they communicate and linking it to the evolution of communication systems.

6 Conclusion

I have explained and analysed the human-like features of cetacean and primate communication in terms of Hockett's design features and I believe the most important takeaway is that cetaceans and primates are still not found to have certain key features like productivity and learnability. Furthermore, we are yet to have a perfect understanding of any animal communication system. Despite this, research into advanced systems has implications on piecing together the evolution of animal communication into human language. That is why I chose to review research on such advanced mammal communication. As fellow mammals, they could be bridging the gap between our biological predecessors' way of communication and our faculty of language. I do not agree with the categorical approach defining what sets human language apart from animal communication after considering that this strict interpretation of the design features becomes unsound towards some animals' ways of communication. I argue that considering what makes animals and humans different should be more on a continuum than categories. Acknowledging that animals can have complex communication systems that are close to the threshold of human language will help humans to understand animals better as researchers inch closer to figuring out how exactly we can talk to them (Wolchover, 2012).

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