

The effects of auditory stimuli on prelinguistic categorisation: a proposed comparative study

Recent debates in language evolution have highlighted the need for direct empirical investigations which compare the communicative and cognitive abilities of humans and other animals. A particular topic of controversy is the extent to which human language built off of evolutionary preadaptations shared with other species, versus the extent to which it specifically required linguistic adaptations which are uniquely human.

One of these issues is that of predispositions to different kinds of sounds. Many recent developmental studies have studied the effects that words have on prelinguistic infants' visual categorisation. For instance, Fulkerson & Waxman (in press) used a familiarisation/novelty paradigm overlaid with different sound conditions. Young infants (6-month-olds and 12-month-olds) were shown a sequence of pictures from one category (e.g., dinosaurs) in a familiarisation phase, and along with each picture the same auditory stimulus was played from a hidden speaker (either a word or a pulse tone). Then in the test phase, two pictures were shown side-by-side, one from the familiar category (e.g., another dinosaur) and one from a novel category (e.g., fish), and infants' looking times were measured. Infants in both age groups showed a reliable novelty preference in the word condition, but showed no significant preference in the tone condition. According to the authors, the results add support for the hypothesis that speech is special and that words have an enhancing effect on categorisation.

Although a body of other experiments has used a somewhat larger range of auditory stimuli in this general paradigm and has generally obtained similar results, it is still premature to conclude that it is specifically words which have a special effect on infants. Moreover, although the looking-time technique has been successfully adopted by comparative psychologists, analogous experiments to the infant study described here have yet to be performed with non-human primates. This PhD aims to address these concerns, by employing a more diverse range of auditory stimuli (such as human words, monkey vocalisations, predator shrieks, natural environmental sounds), and performing the experiments with both prelinguistic human infants and non-human primates (i.e., capuchin and squirrel monkeys). The experiments would thus help us converge on what kinds of auditory stimuli enhance infants' categorisation, and investigate how specific these predispositions are to humans. The results would thus have important implications for language evolution.

However, there are various concerns of methodology and interpretation. It is very possible that even with close consideration of ecology and a careful selection of auditory and visual stimuli, the monkey experiments will simply yield no significant effects. This concern is compounded by the fact that the number of monkey subjects at the Edinburgh Zoo is fairly small. Moreover, the monkeys are adult, so they may be relatively inflexible and disinterested in the experiments, and even if significant results are obtained, they would not be directly comparable to those of human infants. Also, the monkeys are in captivity, and may well have different behaviour and sensitivities to certain kinds of stimuli than wild monkeys, which could certainly be relevant for language evolution implications.

As a result, although the proposed study could illuminate certain issues in language evolution, there are significant risks that the results will be quite limited. Opinions and advice would thus be greatly appreciated.

References

Fulkerson, A. L. & Waxman, S. R. (in press), 'Words (but not tones) facilitate object categorization: evidence from 6- and 12-month olds', *Cognition* .