

A Perspective on Language Evolution from Studies of Graphical Languages

Patrick G.T. Healey
Queen Mary, University of London
ph@dcs.qmul.ac.uk

Nik Swoboda
Universidad Politécnica de Madrid
nswoboda@fi.upm.es

The possibility of successful human communication is often explained by appeal to internalised representations or codes that enable the processing and interpretation of natural languages. Evolutionary theory is often invoked to address difficulties in explaining how such codes could be internalised or naturalised. We argue that no viable evolutionary account has been offered that can explain the how such an internal representation could have evolved. Accounts that appeal to computational advantages face the problem that natural languages are poor media for computation and that it is the development of external representations such as drawings and scripts, not language, that is most tightly correlated with enhanced cognitive abilities. Accounts that appeal to communicative advantage often appeal to some form of group advantage for their evolutionary mechanisms and thus, inherit the problems with group selection. We argue that the premise that human communication depends on some form of 'shared' code is incorrect.

We propose instead that the concept of communicative success should be understood in terms of mutual-indiscriminability and that language evolution should be understood in terms of the mutual-modifiability of the artifacts and technologies that are used to support the language. These ideas are illustrated by experiments on the evolution of graphical languages.

Recent research has shown many relations between spoken dialogue and written dialogues employing only graphical (non-character based) elements[Healey et al., 2002b]. For example, participants in graphical exchanges match each other's style of drawing more often than would be predicted

by chance ([Healey et al., 2002a]), this echoes the 'entrainment' phenomena that have been identified for verbal dialogue[Pickering and Garrod, 2003]. Similarly, it has been shown that under some circumstances, patterns of graphical turn-taking emerge that are similar to those found in conversation[Umata et al., 2003]. Given these parallels, we wish to suggest that a greater understanding of the evolution of language in general can be gained from the study of the evolution of language in these graphical dialogues.

In previous work, we have shown that when the level of communicative interaction between the participants varies, the form of the representation produced by the pair also varies [Healey et al., 2003]. These results suggest that three different processes contribute to changes in graphical form in these tasks: practise, reduction and mutual-modification. We propose that the last of these, mutual-modifiability is central to the evolution of new symbols and new representational systems. The reduction of recurring representations, by definition, is a conservative process that can support refinement of representations but not changes in their interpretation. For concepts that need to be communicated often, the main problem is arriving at the most efficient label for that concept. However, the development and modification of new conventions requires processes that can sustain generalisations across multiple concepts. This entails being able to modify and adapt the semantics of the representational system. Mutual-modification, we propose, provides a basis for this by providing mechanisms through which individuals can co-ordinate their interpretations of their evolving graphical language.

References

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