

## THE MULTIPLE STAGES OF PROTOLANGUAGE

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An ongoing debate concerns whether the words in protolanguages expressed single atomic concepts (Bickerton, 1990), or whether they were holophrastic (Wray, 1998). Here we suggest that there is no clear distinction between holophrastic and atomic meanings, as there is no clear definition of what level of conceptualization is atomic. We show that there is a continuum between holophrastic words and words denoting single concepts, depending on how narrow a range of meanings each word denotes. Using a computer model, we show that the type of words occurring in protolanguages could have changed over time, and that protolanguages could have contained a mixture of words of differing degrees of holophrasticity. We must therefore take into account these alternative possibilities when considering the nature of protolanguage.

Holophrastic words convey complex meanings comprised of several constituent concepts, while words in modern languages are said to express single concepts. However, when we compare different languages we often find that words for some domain have much narrower and more specific denotations in one language than in another. For example, while in English we have the word *brother*, Japanese has separate words for younger brother (*otouto*) and older brother (*ani*), while German has a single word meaning brother or sister (*geschwister*). This suggests that the English and Japanese words are in fact multi-concept holophrases (MALE-SIBLING and YOUNGER/OLDER-MALE-SIBLING respectively). A similar situation is seen within languages when one word expresses a more specific meaning than another. Consider for example English *die*, *kill*, *murder* and *strangle*, where each successive word conveys somewhat more information. Is *strangle* therefore a holophrase for 'Illegally cause to die by choking', or are both DIE and STRANGLE atomic concepts with overlapping denotations? Furthermore, some of the holophrases that have been proposed seem to convey far more concepts than others. Compare 'Give

her that' (Wray, 1998, p56) with 'Take your spear and go around the other side of that animal and we will have a better chance together of being able to kill it' (Arbib, 2005, p118-119). Here we suggest that holophrastic words and words that appear to denote atomic concepts are simply arbitrary points on a continuum regarding the generality or specificity of denotation.

Our argument was backed up with a computer model containing language agents that had the capacity to learn and use words, but which had no syntactic competence, hence restricting them to the use of asyntactic protolanguages. Gradual phylogenetic changes in the agents' communicative and conceptual abilities were simulated, and we observed the effect of these changes on the languages used by the agents. It was found that increasing the agents' communicative abilities resulted in more words with increasingly holophrastic meanings, as the greater number of words allowed for a situation in which each denoted a narrower range of meanings. In contrast, increasing the number of different meanings that the agents tried to communicate produced protolanguages in which the words had increasingly general denotations, as there were now so many meanings that each word had to express more of them.

When both communicative and conceptual abilities grew in tandem, the languages became more or less holophrastic depending on the relative rate of growth of each capacity. Hence, if these abilities grew at different rates during the course of human evolution, we could expect the degree to which protolanguages were holophrastic to have both increased and decreased over time. There does not seem to be any good reason to assume that protolanguages were ever completely holophrastic, or that all their words ever expressed a single atomic concept. Protolanguages may even have gone through stages when their words were even more general than those in modern day languages, or when they expressed even more than a whole sentence.

## References

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