Language as a biocultural niche

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How can culture be conceptualized from an evolutionary and ecological point of view, what are the relations between biology and culture, and how do theories of biology and culture bear upon theories of language? Culture can minimally be defined as the existence of intra-species group differences in behavioural patterns and repertoires, which are not directly determined by ecological circumstances (such as the availability of particular resources employed in the differing behavioural repertoires), and which are learned and transmitted across generations. On this definition, there is ample evidence of cultural differences in foraging strategies, tool use and social behaviours in chimpanzees. Such a definition will also qualify, for example, epigenetically learned intra-species dialect differences between songbird communities as cultural and culturally transmitted behaviour.

Some biologists have argued on this basis for the reduction of culture to the mere expression of biology. Other biologists, however, increasingly acknowledge the role of culture in shaping the evolutionary process at the genetic level, by the construction of new selective environments (Laland, Odling-Smee and Feldman, 2000). Laland et al. (2000: 132) criticize the "human-centred" perspective of many accounts of gene-culture co-evolution, pointing out that many non-human species behaviourally co-direct genetic evolution through niche construction. This perspective situates the role of culture in human evolution within a wider class of processes involving adaptation to behaviourally induced changes in selective environments (niches or "artifacts" such as nests, dams, mounds and burrows). A particular role is played in the theory advanced by Laland et al. (2000:144) by genotype/niche combinations labeled by "phenogenotypes", which they propose as replicators functionally equivalent to organisms: a phenogenotype is a class of organisms in a bound (though not genetically determined) relationship with some aspect of a self constructed (including culturally constructed) environmental niche.

Although Laland *et al.*'s model is a general one, not confined to human culture and evolution, they acknowledge that humans are "unique in their extraordinary capacity for culture" (p. 133). I interpret this to mean primarily that human cultures are unique in some fundamental respect, that is they are different (perhaps discontinuously) from the cultures of other species; and secondarily that the capacity for creating, acquiring and transmitting cultural forms is uniquely developed (though clearly not unique) in humans. Cultural acquisition and transmission is mediated in humans by the human language capacity. The nativist modular account of this capacity proposes its inscription in the human genotype. An alternative account, along the lines of the co-evolutionary theory of Laland *et al.* (2000), would view the human language capacity as phenogenotypic. Language, in this account, is an artifact/niche, and the capacity to acquire and use it involves the evolution and replication of a phenogenotypic "biocultural complex" (Laland *et al.* 2000: 144).

Such an account does not require the organism to possess an internal model of the grammar of a language to account for language acquisition and use, any more than the building of a nest requires an internal model of the nest. The grammar of the language is *in the language*, just as the structure of the nest is in the nest. The capacity for language is thus a cognitive-behavioural relationship between language user and the constituents of language, just as the capacity for building a nest is a cognitive-behavioural relationship between the builder and the constituents of the nest; and it is this *relationship* that, in each case, has been selected for in evolution. This account is thus compatible with usage-based, cognitive functional theories of language.

The language artifact/niche is culturally situated, that is, dynamically embedded

within a semiotic network which includes other symbolic and non-symbolic artifacts. The class of organisms with the language capacity (normally developing humans) is thus a phenogenotypic replicator systemically associated with a wider biocultural complex of symbolic and constructive cognitive capacities, also of a phenogenotypic nature; and individual language acquisition and use is situated in the contexts of actuation of these inter-related capacities. This account accords with the view what makes humans unique is not an innate language acquisition device plus a variety of other species-specific innate cognitive modules, but a generalized semiotic or symbolic capacity, epigenetically developed from a suite of cognitive capacities largely shared with other species, but attaining higher levels of organization in humans (Zlatev *et al.* 2006). It is my contention, then, that contemporary developments in evolutionary biological science can be adduced in support of a semiotically and socio-culturally situated approach to language and mind (see also Sinha, 1988).

References

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