

# **The Language Organism**

## **The Leiden theory of language evolution**

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### ***Language is an organism.***

Language is neither an organ, nor is it an instinct. Language is a symbiotic organism. In the past two and a half million years, we have acquired a genetic predisposition to serve as the host for this symbiont. Like any true symbiont, language enhances our reproductive fitness. We cannot change the grammatical structure of language or fundamentally change its lexicon by an act of will, even though we might be able to coin a new word or aid and abet the popularity of a turn of phrase. Language changes, but not because we want it to. We are inoculated with our native language in our infancy, most usually by our parents. Like any other life form, language consists of a self-replicating core. The units of this self-replicating core are memes and their neural correlates. As extra-genetic replicating units of information, memes are analogous to genes, but the analogy is not a perfect one, and the analogy may hamper our understanding of language if taken too far.

### ***A meme is not a unit of imitation.***

What precisely is a meme? The Oxford English Dictionary defines a meme as ‘an element of culture that may be considered to be passed on by non-genetic means, esp. imitation’. This is a British lexicographer’s recapitulation of Richard Dawkins’ original coinage:

I think that a new kind of replicator has recently emerged on this very planet. It is staring us in the face. It is still in its infancy, still drifting about in its primaeval soup, but already it is achieving evolutionary change at a rate that leaves the old gene panting far behind. The new soup is the soup of human culture. We need a name for the new replicator, a noun that conveys the idea of a unit of cultural transmission, or a unit of *imitation*. (1976).

This Oxford definition of the meme is incomplete and linguistically uninformed. Charles Darwin came closer to the Leiden definition of the meme when he wrote that ‘the survival or preservation of certain favoured words in the struggle for existence is natural selection’ (1871). The Leiden school of language evolution is therefore not what Susan Blackmore calls ‘the memetic theory of language’, which is essentially a linguistically naïve view:

Whether a particular sound is copied because it is easy to remember, easy to produce, conveys a pleasant emotion, or provides useful information, does not matter. ...There is no such problem as the symbolic threshold with the memetic theory of language. The critical step was the beginning of imitation. ...Once imitation evolved, something like two and a half to three million years ago, a second replicator, the meme, was born. A spoken grammatical language resulted from the success of copyable sounds. (1999)

Language is more than just copyable sounds. A unit of imitation is a mime, and a mime does not meet the criteria of fecundity, high-fidelity replication and longevity required to qualify as a successful life-sustaining replicator.

***A meme is a meaning.***

Language exists through meaning. The Leiden school defines memes as meanings in the linguistic sense. Grammatical memes, i.e. the meanings of grammatical categories, are the systemic memes of any given language and are demonstrably language-specific. The meanings of words, morphemes and fixed idiomatic expressions are lexical memes. Some lexical memes are systemic and structural for a given language. Some are free-wheeling and parasitic. Some occupy an intermediate status. The idea that America is one nation under God, indivisible with liberty and justice for all, is not a meme. It is an articulate idea composed of a number of constituent lexical and grammatical memes, and this idea and its constituent parts are subject to Darwinian natural selection.

Researchers in the field of Artificial Intelligence fail to address the problem of meaning when they resort to the propositional logic developed by the English mathematician George Boole. The adequacy of this approach is claimed as long as the variables are ‘grounded’. By grounding, logicians mean that there is some determinate way in which variables or symbols refer to their referents. A crucial insight of the Leiden school is that natural linguistic meaning does not obey the laws of Aristotelian logic or Boolean propositional calculus. A linguistic meaning *thrives* by virtue of its applications, which cannot be deduced from its implications. The implications of a meaning must be derived by its applicability, rather than the other way around. By consequence, a meaning has the properties of a non-constructible set in the mathematical sense. Take for instance: (1) Man is numerous. (2) Socrates is a man. (3) Socrates is numerous.

From a linguistic point of view, the inference ‘Socrates is numerous’ is equivalent to the first syllogism of traditional logic. This is no mere word play. The problem is fundamental to language. The behaviour of the English meaning *open* is such that ‘The door is open’ can be said of a shut but unlocked door, in that the door is not locked. Likewise, of the same door it can be said that ‘The door is not open’, for it is shut. It is a cop-out to postulate polysemy to clarify such usages because the meaning of English *open* remains unchanged in either case. The same situation can be truthfully referred to by a linguistic meaning as well as by its contradiction.

Yet there is no way of formalising a contradiction in traditional logic because of the principle of the excluded middle, i.e. *tertium non datur*. This principle, which dates back to Aristotle, renders classical logic a powerful tool and simultaneously makes classical logic a mode of thought which is at variance with the logic of natural language. The insight that meaning operates according to the mathematics of non-constructible sets was set forth by Frederik Kortlandt in 1985 in a seminal article entitled ‘On the parasitology of non-constructible sets’. The insight that human language operates independently of the principle of the excluded middle had already been propounded by the Dutch mathematician L.E.J. Brouwer when he developed intuitionist set theory in the first quarter of the 20th century. Brouwer rejected the principle of the excluded middle for language and went as far as to warn mankind that linguistically-mediated ideas and language itself were inherently dangerous.

***Tertium datur.***

The fact that meanings have the nature of non-constructible sets does not mean that meanings are fuzzy. Rather, meanings correspond to sets which are indeterminate in that there is no *a priori* way of saying whether a particular referent can or cannot be identified as a member of a set. If a homeless person in Amsterdam calls a cardboard box a house, that box becomes a referent of the word *house* by his or her very speech act. The first bear most children are likely to see today is a cuddly doll from a toy store and not a member of a species of the *Ursidae* family. Errett Bishop, chief proponent of the school of constructivist mathematics which grew out of intuitionist set theory, also rejected the principle of the excluded middle. He observed that ‘a choice function exists in constructivist mathematics because it is implied by the very meaning of existence’ (1967).

Even though Willard Quine adhered to the principle of the excluded middle throughout his life because of its utility as ‘a norm governing efficient logical regimentation’, he conceded that this Aristotelian tenet was ‘not a fact of life’, but was in fact ‘bizarre’. Classical logical analysis requires the identifiability of distinguishable elements as belonging to the same set. In the case of an extensional definition, it presupposes a sufficient degree of similarity between the indicated and the intended elements. In the case of an intensional definition, it presupposes the applicability of a criterion, which depends on the degree of similarity between the indicated property and the perceptible characteristics of the intended objects. The constructibility of a set is determined by the identifiability of its elements. Language does not generally satisfy this fundamental requirement of logic.

The nature of meaning is a direct function of its neural microanatomy, whether this be an electrochemical gradient of protons along a cell membrane, some other feature of the neural transport system, or the very way neurons branch and establish their webs of circuitry in our brains. The parasitic nature of linguistically mediated meanings does not mean that there is no such thing as invariant meanings or *Gesamtbedeutungen* of individual lexical and grammatical categories. Invariant meanings are functionally equivalent within a given speech community and can be empirically ascertained through Wierzbickian radical semantic analysis. Language began to live in our brains as an organismal memetic symbiont when these brains became host to the first replicating meaning. The difference between a meaning and a signal such as a mating call or the predator-specific alarm calls of vervet monkeys is that a meaning can be used for the sake of argument, has the properties of a non-constructible set and has a temporal dimension.

***Syntax is a consequence of meaning.***

Syntax arose from meaning. Syntax did not arise from combining labels or names for things. Syntax arose when a signal was first split. In 1919, Hugo Schuchardt had already argued that the first utterance arose from the splitting of a holistic primaeval utterance, not from the concatenation of grunts or names. First-order predication arose automatically when the first signal was split. For example, the splitting of a signal for ‘The baby has fallen out of the tree’ yields the meanings ‘That which has fallen out of the tree is our baby’ and ‘What the baby has done is to fall out of the tree’. Mária Ujhelyi has considered long-call structures in apes in this regard.

The ability to intentionally deceive is a capacity that we share with other apes and even with monkeys. In using an utterance for the sake of argument, the first wordsmith went beyond the capacity to deceive. He or she used an utterance in good faith, splitting a signal so that meanings arose, yielding a projection of reality with a temporal dimension.

Since when has language resided in our brains? The idea that the Upper Palaeolithic Horizon is the *terminus ante quem* for the emergence of language dates back at least to the 1950s. The sudden emergence of art, ritual symbolism, glyphs, rock paintings and animal and venus figurines 60,000 to 40,000 years ago set the world ablaze with new colours and forms. The collective neurosis of ritual activity is an unambiguous manifestation of linguistically mediated thought. However, rudimentary stages of language existed much earlier. What the Upper Palaeolithic Horizon offers is the first clear evidence of the existence of God. God is the quintessential prototype of the non-constructible set because it can mean anything. This makes God the meme almighty. The British anthropologist Verrier Elwin quotes the Anglican bishop Charles Gore:

I once had a talk with Bishop Gore and told him that I had doubts about, for example, the truth of the Bible, the Virgin Birth and the Resurrection. ‘All this, my dear boy, is nothing. The real snag in the Christian, or any other religion, is the belief in God. If you can swallow God, you can swallow anything.’ (1964)

The brain of our species has grown phenomenally as compared with that of gracile australopithecines or modern bonobos, even when we make allowances for our overall increase in body size. Early language drove hominid brain evolution at least as radically as any symbiont determines the evolution of its host species. Language engendered a sheer tripling of brain volume from a mean brain size of 440 cc to 1400 cc in just two and a half million years. This process provided the green pastures in which language could settle and flourish.

The role of innate vs. learned behaviour in the emergence of language is an artificial controversy when viewed in light of the relationship between a host and a memetic symbiont lodged in its bloated brain. In the past 2.5 million years, our species has evolved in such a way as to acquire the symbiont readily from earliest childhood. Our very perceptions and conceptualisation of reality are shaped and moulded by the symbiont and the constellations of neuronal groups which language sustains and mediates.

A 203-page account of the Leiden theory of language evolution is given in:

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