

## 6SSEL045 – Language Origins

### Lecture 1

#### What is Language?

#### WHY CONSIDER THE –ISMS?

Any science that has not fossilised is based on a range of theories which may be complementary, but which may also be contradictory. For instance, physics itself is far from being fossilised science, and has two contradictory theoretical models: relativity theory provides a comprehensive explanation of the universe at the largest scales, and quantum theory does the same at the smallest scales; but, where relativity is concerned with fixed and measurable outcomes, quantum theory is concerned with increasing uncertainty as the scale gets smaller. Both theories attempt to explain the universe, but in very different ways.

Linguistics, as a science, is also based around a set of theories which are contradictory, mainly because the definition of what counts as language varies between topics and between individuals. That is why you have reached the second term of the third year of this BA degree, and you are still being asked the question, what is language? In this module we consider language as an evolutionary and social object; the role of lexis and grammar will be considerably reduced in our models, and the role of pragmatics will be enhanced.

#### WHAT IS LANGUAGE?

There are four questions about language that are of significance for language origins:

- Which parts of language are essentially innate in all human beings, and which are learned?
- Which features of human language make it unique as a signalling system, or do all features have analogies in non-human systems?
- Is language an independent structure in the brain or a process that uses other, previously existing, brain functions?
- Do the rules of syntax define language or do they just facilitate communication?

We do not yet have good answers to any of these questions, and different –isms offer different answers.

#### WHAT IS LANGUAGE FOR?

There are five possible purposes for language. Some of them are mutually exclusive, but any of them could be the primary purpose, if such a thing exists.

- **Is language primarily for thinking?** If so, then any external occurrence, while extremely significant in terms of being human, is secondary in terms of language origins.
- **Is language primarily for signalling?** If so, then any effects language has on cognition, while being significant, are secondary.
- **Is language primarily a facilitator for socialisation?** If so, then it is not about truth and communicating truthful ideas, it is about establishing social systems.
- **Is language primarily a social instrument?** Utterances do not just lubricate socialisation, they create new realities. John Austin created the term “performative language” to describe the unusual effect that “doing things with words” has on the nature of language.
- **Is language primarily for communicating?** Signalling is a process of making information publicly available, and it is essentially one-way; communication is a process of negotiating toward meaning. In this form it has a social role, but that role makes language more of a cultural tool than an interpersonal tool.

In each of these models, language is happening differently: as a mechanism inside a single brain, as an object transmitted between two brains, as a lubricant inside a group, as a culture-making tool, and as a social relationship between people. Language does all these things, so no –ism can tell the whole story.

#### HOW DOES LANGUAGE WORK?

Languages needs brains. This does not mean that brains are built for language, although it may mean that languages are built to work in a Statistically Standard Brain. What it does mean is that the encoding of intention into language and the decoding of language into understanding must use resources which are already present in the brain. Language is a **system**, which means that it has a **process** (converting my intention to mean into your understanding of my intention to mean), and a **structure** (the two brains doing the encoding and decoding, and the medium through which messages are transmitted); this structure must therefore have mechanisms to produce **outputs** (speaking and gesture), and mechanisms to notice and interpret **inputs** (listening and looking).

If we look at the brain in terms of encoding, we can see that the intention to mean produces meaning through the engagement of lexis and semantics (words), syntax and grammar (rules), and phonology (sounds and gestures). All these cognitive mechanisms have been influenced by encounters with other brains, because they must exist in every brain if communication is to happen. When all the meaning-producing areas in a single brain do their work effectively, they generate an “app” which can be “run” in the motor control area to produce physical speech and gesture. This physical speech and gesture then goes out into the world as a signal.

A signal is, however, speculative; it relies on another brain able to pick it up and decode it if it is to become communication. If a tree falls on a person in a forest and they say “ow!”, it is always a signal; but it is only communication if another person is there to understand their “ow!” So how does this work?

The signal consists of sound and gesture, so the part of the brain that deals with phonology must be engaged first. This uses a special mechanism (which we call mirror neurons) in the motor control area to recreate in the receiver’s brain the motor functions that must have been used in the signaller’s brain to produce the signal. Essentially, mirror neurons produce a map of the words and rules to which the sounds and gestures of the signal refer, allowing the receiver to understand the signal in terms of those words and rules. The system is not perfect, the sound, gesture, words and rules may not map exactly between the two brains; but as a first stage in the negotiation toward meaning, it seems to work quite well.

Mirror neurons are not exclusive to humans. They were first detected in macaques (Rizzolatti & Fabbri-Destro, 2010), and appear to be active in many primate species. However, they do seem to be a necessary precursor for human language, and have been explored in this role by Arbib et al (2008). It is certainly true that, without a functioning mirror neuron system, we would have limited capacity to negotiate toward meaning, and building a Theory of Mind would be problematic (Call & Tomasello, 2008).

#### ARDI, THE UNCOMMON ANCESTOR

In the 20th century, the accepted paleontological view was that **Australopithecus** was the first bipedal hominid having been dated to 4.2mya (million years ago). It was assumed that the chimpanzee-human common ancestor looked and behaved much more like a chimpanzee than a human. Then, in 2000, came **Orrorin tugenensis** (6mya): the fossils included a legbone, which could have come from a bipedal individual (Richmond & Jungers, 2008). The evidence was strengthened in 2002 with **Sahelanthropus tchadensis** (6.8mya): there was only a skull, but the spinal hole position indicated an upright stance (Brunet et al, 2002). Then, in 2009, Tim White’s team announced **Ardipithecus ramidus**, from 4.5mya (Suwa et al, 2009). It was a largely complete skeleton, with supporting fossils from several other individuals; and it was clearly bipedal. It now seems that, from the evidence, the last common ancestor of Pan and Homo was less

chimp-like than we believed, and it was more bipedal than modern chimps are.

### BUILDING BIGGER BRAINS

During our evolutionary development, our brain has increased from the 375cc of Sahelanthropus to the 1350cc of modern humans. However, Neanderthals had a brain size of 1600cc, and Homo sapiens of 20kya (thousand years ago) had a brain size of 1500cc. The usual explanation is that the larger-brained ancestors were more robust, so their brain-size-to-body-size ratio was the same as ours; but two alternative explanations are:

- Our brains have become more efficient, so we can do the same thinking as before but with less brain matter;
- Language and writing mean that we no longer have to store all our information in one head. We can use the brains of those around us, and we can store information outside of brains.

The brain is incredibly energy-hungry: for modern humans, it is 2% of the body by volume, but takes 20% of the energy. Only the gut takes as much energy. In evolutionary terms, therefore, there must have been a pressing reason for developing large brains.

One reason we were able to develop large brains was that we began to cook our food. This pre-digestion process meant that our guts could reduce in volume, creating an energy surplus, which was then available to increase brain sizes. This may have been the cause of the second big jump, from H. erectus to H. heidelbergensis. However, it leaves both earlier and later interspecies size jumps unexplained.

We can say that what probably drove the increases in brain size were increases in group size and social complexity; but how we were able to meet these new cognitive demands in terms of energy intake remains somewhat of a mystery.

### HOW OLD IS LANGUAGE?

When you believe language began is a matter of how you define language, and what you think early humans could do.

- If language started 2mya, then **Homo habilis** was the first language-using species. With a brain about 50% of modern humans, language would have been very basic and lacking many of the features of modern language.
- If it started 1mya, then **Homo erectus** was the first language-using species, with a brain size about 67% of modern humans.
- If it started 500kya, then **Homo heidelbergensis** was the first language-user. Their brains were about 90% of modern human size, so their language could have been quite similar to our modern language.
- If language started 100kya, then language is exclusive to our species, **Homo sapiens**. Language could have emerged almost instantaneously because of a sudden unprecedented mutation; or it could be that human communication passed the threshold of what we define as language. As that threshold remains ill-defined, and advantageous mutations are rare, both these explanations are unsatisfactory; but 100kya remains a popular date for the origin of language.

There are supporters for all four of these scenarios. Chomsky even supports the appearance of full language at 50kya. However, for Chomsky, language isn't language without recursion – which required an unprecedented mutation, and is also the threshold he believes that we (and no other species) has passed.

We don't yet know how language appeared; it could have been suddenly and completely, or slowly and messily. The first is unlikely and unsupported by genetics; the second relies on your definition of language.

### THREE KEY –ISMS OF LINGUISTICS

#### Generativism:

The key features of language are grammar and syntax – the capacity to use rules in the production of signals, allowing us to combine meanings into novel, propositional meanings. These rules are the product of innate, peculiarly human, cognitive systems which are dedicated to language. Linguistics should be the scientific study of language as a universal cognitive phenomenon. Social applications of language are distractions that are not core linguistics.

#### Generativism has at least three different forms:

- Revised Extended Standard Theory: language is essentially computational, so there must be a computation system which is specialised for language. This system must be species-specific, but universal within the species; and it may be monolithic or composed of specialised modules. Few linguists are still working with REST.
- Principles & Parameters: the key component of language is the sentence, which is composed of nested noun phrases and verb phrases. The way components work to make sentences is bound by a finite range of rules, many of which are universal.
- Minimalism: the range of rules behind language is remarkably small, and there may be only one (MERGE). Humans are the only species which seem to be capable of recursion; and it is this capacity which lies behind MERGE and, therefore, all language.

#### Cognitivism:

The way we work in the world determines the forms of language we use – language is embodied. It is also a product of brains, but it is a solution to the cognitive problems of living and working together – it is a way of applying thinking rather than a way of thinking. Cognitivism is an umbrella term for many different approaches to language – particularly metaphor, semantics and grammar; there are several different cognitive grammatical systems, reflecting the different ways that language is used to engage in communication. Cognitivists tend to define cognitivism as including the work they are currently doing, so it is an -ism without fixed boundaries.

#### Functionalism:

Functionalism is mainly interested in describing language as used rather than language as a concept. Functionalism has a range of forms (e.g. Lexical Functionalism, Danish Functionalism, Axiomatic Functionalism), but the most used is Systemic Functionalism (SF). In SF, language has three, or four, or five, systemic clusters of function:

- Textual metafunction: the text is itself an encoding of meaning.
- Interpersonal metafunction: meaning is encoded into the pre-existing cultural relationship between speakers and listeners.
- Ideational metafunction: meaning is encoded in the minds of speakers and listeners, and language is the conduit between minds.
- Experiential metafunction: this is a subset of the ideational metafunction; what speakers and listeners share is their experience of the world.
- Logical metafunction: the other subset of the ideational metafunction; experiences can be combined to make new knowledge about the world.

If you are wondering whether these –isms actually matter to linguists, look at <http://facultyoflanguage.blogspot.ca/2015/04/does-lsa-and-its-flagship-journal.html?m=1>

### WHAT IS BEING HUMAN?

We like to believe that we have a raft of generalised skills which make us qualitatively very different from other species; but what makes us different seems to be a simple triad of co-operation, imagination and negotiation, none of which are unique to *Homo sapiens*. It is the quantity of the three skills that makes us different, not their quality. Until recently, we were not even the only species

with our particular combination of the three skills – other species of Homo still walked the planet; and, even if today we are unique in having that combination, unique does not mean special or privileged. Every species has a set of skills which has been honed by evolution to enable the species to thrive in a particular ecological niche. As long as the niche exists and a more capable species does not exist, the species will survive.

Humans are no different, although our niche is a little odd: it seems to be technology, which enables us to live in environments for which we are otherwise unsuited; but we can only do so by using technology to alter the environment, locally or globally. Technology is highly inefficient in terms of resources: it gobbles them up in large quantities to make small environmental changes; and it doesn't usually adjust the environment to a different point of stability, mostly it destabilises.

In 1972 we launched the Pioneer 10 space probe to investigate the outer solar system, and we put a plaque on it to tell any aliens who might pick it up where it came from. A few years later, when Pioneer 10 was beyond recall, some scientists asked whether this was a good idea; what if the aliens were xenophobic? The technology niche is about short-term solutions to immediate problems, asking forgiveness not permission; but it only works if, after the technology has been applied, there is anyone left to grant forgiveness.

### **IS LANGUAGE UNIQUELY HUMAN?**

Language is a tool which enhances our co-operation, imagination and negotiation, and is probably the main driver for the quantitative uniqueness of humans in the three skills. However, the question of whether language is unique to humans is far from settled: it depends on what you count as language. This will be reviewed in lectures 2 to 4, but for now there are three questions you could consider on the topic:

- What should we look for in nonhumans as indicators of language? Does it have to be full grammatical language, or is something else enough?
- Do you have to be species-human to use a language-like communication system, or is being culturally human enough?
- What counts as "having language"? When and how do human children "get language"?

You have probably worked out by now that your definition of language is going to dictate your approach to language origins.

### **HOW WE GOT TO LANGUAGE**

One of the two assignments in this module is to write a summary or abstract for one of the topics listed on the EAORC Routes to Language page. There are over 50 to choose from, one of which (Machiavellian Intelligence) has been set up as an example. There will be more on writing the summary-abstract later, and there is a booklet on KEATS about the assignment.