

# PSYC3311 – LANGUAGE AND COGNITION

## LECTURE 1 – INTRODUCTION

We as adult human beings possess language. We interact with language both in terms of comprehending it and producing it, both in the *visual* and in the *auditory* modalities. This course is going to essentially address the issue of HOW.

There is more to language than learning vocabulary. Words combine together in a particular way to convey a particular meaning. This is **syntax = grammar**.

Perhaps we simply have learnt a whole lot of sentences that we can produce at the appropriate time. This is essentially what B F Skinner, the behaviourist, proposed in the late 1950s. He basically said that language is nothing special, but is a form of behaviour that humans simply learn in the same way that pigeons learn to peck a key, or parrots are taught to talk.

But there is a big difference between human language behaviour and parrot's talking: Parrots can only say what they've heard and often in the wrong context. They're just mimicking (though see Pepperberg's work with Alex the grey parrot. Under "Useful Links" in Moodle). Humans can *create* and *understand* a huge number of utterances.

This creativeness of language and the ability to cope with *novelty*, was one of the important points made by **Noam Chomsky** in his influential review of Skinner's book. How can we produce entirely new sentences that others immediately understand?

Chomsky proposes that the ability of humans to learn language is **innate** (and is special to humans).

The language we learn will have specific structures that need to be specifically learnt (e.g., English vs Chinese), but underlying this are language universals. Things that are common to all languages and that are compatible with the innate mechanism that humans have evolved.

A major argument in favour of language being innate is that no other animals have language. Animals certainly are able to **communicate**, but is this really the same as using language? Is it more equivalent to our human yelps and cries?

Language is characterised by several features of which the most important are:

- **Semanticity**: Signals consistently mean something relevant to the world. But perhaps true for certain animals as well. E.g., vervet monkeys makes a different noise depending on the type of predator it encounters.
  - Semantics = memory
- **Arbitrariness**: While the signal used to represent a meaning is consistent from occasion to occasion, it is arbitrary in the sense that it is not a direct representation of meaning (except for onomatopoeia and sound symbolism).

- Onomatopoeia: Cat in Chinese is Maow may be because of meow
- Sound Symbolism: another example of non-arbitrariness. Zog= bigger animal. The sound of “o” has to do with a rounded shape. Words systematically have pronunciation which corresponds to what their sound symbolises. There isn’t much evidence of sound symbolism. This highlights the fact that sounds are arbitrary.
- **Ability to handle novelty:** One can create and understand new messages. This is probably the most important feature of language (as highlighted by Chomsky). It seems to imply that there are a finite number of rules and patterns that we can learn that can be used to generate and comprehend the potentially infinite number of sentences that we interact with.

A distinction can be drawn here (Chomsky) between the knowledge that one can potentially have about the rules and patterns (i.e., structure) of language and the actual use of them. i.e., **competence vs performance**.

### = linguistics vs psycholinguistics

**Linguist** – interested in studying the structure of language

**Psycholinguist** – describes how we as humans make use of that structure to understand and produce language. Takes into account the cognitive mechanisms that a human possesses, including cognitive limitations.

As a result of these limitations performance does not always coincide with competence: e.g., CATS DOGS CHASE CHASE RATS is strange but a valid linguistic structure. And it's not too hard to understand. *This is known as an embedded sentence.*

But: HOUNDS HOUNDS HOUND HOUND HOUNDS is hard to understand even though it has the same grammatical structure.

- Our memory system gets confused between all the different functions of HOUND in the one sentence.
- Also incomplete sentences are not syntactically correct, but can be interpreted.
- While competence and performance don't always coincide, in many cases they do.

So while the focus of this course is performance, it is often important to understand something about the linguistic structure that is actually used (i.e., competence). For this reason, I will be talking about basic linguistic notions in addition to the cognitive processes involved in making use of that linguistic structure.

Different aspects of language that will be covered:

**Phonology** - the sound structure of words

**Orthography** – the visual representation of words, i.e. their spelling

**Morphology** – internal structure of words relating to stems and affixes.

**Syntax** - the way words are ordered in a sentence.

**Semantics** – the meaning of the sentence which is based on the meaning of the individual words

**Pragmatics** – the interpretation of the meaning of the sentence taking into account the general context (including social setting) in which the sentence occurs.

## LECTURE 2 – PHONOLOGY

We make sounds when air is passed up from the lungs and out of the head through a cavity – the mouth or nose. In order to make the different sounds that we do, we change the shape of this pathway (*articulatory apparatus*). In addition, the vocal chords are either pulled tight and hence made to vibrate (voicing), or they are relaxed and let air pass through them with no voicing.

The smallest unit of sound (for our current purposes) is the **phoneme**.

Two basic categories of phonemes: Vowels and consonants.

**Vowels** - when the air is allowed to pass through with little obstruction and the vocal chords vibrate. Different vowels are made by varying the position of the tongue and the rounding of the lips

e.g., tongue high forward, lips spread = /i/ (or when lengthened, /i:/ as in BEAT)  
tongue low back, lips rounded = /ɒ/ (as in POT)

Some other important examples of non-obvious transcriptions of phonemes into the International Phonetic Alphabet (IPA):

/æ/ as in PAT

/ʌ/ as in PUTT

When a syllable is unstressed, the vowel often reduces to a neutral vowel /ə/ where the tongue stays in resting position in the middle of the mouth and the lips are neither rounded nor spread (as in the second and third vowel of ELEPHANT). Called "**schwa**".

Diphthongs are produced when the tongue and lips slide from one vowel position to another.

/a/ + /ɪ/ → /aɪ/ (as in BITE)

/e/ + /ɪ/ → /eɪ/ (as in BAIT)

**Consonants** – where there is clear obstruction to the air stream.

Consonants differ depending on (a) the way in which the obstruction is made, (b) the place in the mouth where the obstruction is made, and (c) whether or not the vocal cords are vibrating at the same time that the obstruction is made ("voicing").

"**Stop**" consonants are made when the airstream is completely blocked off and suddenly released (plosive).

e.g., bilabial, voiceless /p/ - obstruction is made by two lips.

bilabial voiced /b/

velar voiceless /k/

"**Fricatives**" are made when the air can pass continuously past the obstruction.

e.g., labiodental voiceless /f/

labiodental voiced /v/

palatal voiceless /ʃ/ = /š/ (as in SHIP)  
palatal voiced /ʒ/ = /ž/ (as in TREASURE)

"**Affricates**" begin as a stop consonant, but allow the air to then be released gradually (as with a fricative).

e.g., /tʃ/ = /tš/ = /č/ (as in CHURCH)  
/dʒ/ = /dž/ = /ǰ/ (as in JUDGE)

"**Nasals**" are made when the obstruction is complete, but the air is released through the nose.

e.g., bilabial /m/  
velar /ŋ/ (as in SONG)

Stop consonants differ from the other consonants in an important way. That is, all these other consonants can be made continuous. This is relevant in teaching kids to read. Children have to be able to abstract out the actual phoneme from the shwa syllables.

Fashion /fæʃən/ /mʌŋki:/  
Monkey š /kwaɪə/  
Choir

/saɪkəˈlɒjɪkəl/ Psychological  
/fjuːʃə/ FUTURE  
tʃ