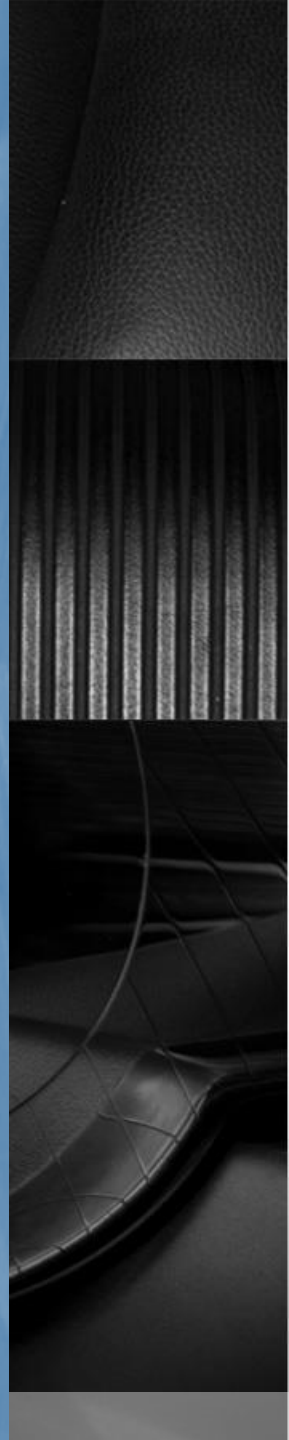


Development of Language





What is language?

- One definition:

“...a system of symbols and rules that enable us to communicate.”

(Harley, 2014)

- Language is a social activity – a form of joint action where people collaborate in order to achieve a common aim

(Clark, 1996)



Different fields of study of language

- The study of meanings is known as **semantics**
- The study of word formation is **morphology**
- The use of language is known as **pragmatics**
- An act of speaking or writing which in itself effects or constitutes the intended action is known as **illocution**



Sapir-Whorf hypothesis (1956a, 1956b)

- Language and Culture
- Additional purpose of language? Evolved to shape our perception
- The Sapir-Whorf hypothesis argues that
 - the form and characteristics of **languages determine the ways in which people think**
 - **different languages will generate different cognitive structures**



Explanations of Language



Language and the Brain - The Biological Basis of language

Are language functions localized?

- Knowledge from lesion studies/autopsies
- fMRI – brain-damaged and non-brain-damaged speakers
- Two brain hemispheres partly specialised
- 96% right-handed people/70% left-handed people – language functions predominantly localized in the **left hemisphere**

(Rasmussen and Milner, 1977)
- Same left-hemisphere regions implicated in use of sign language with either hand

(Corina et al, 2003)

- 
- 1950s - Effects of electrical stimulation on brains of surgical epilepsy patients
 - PET and CAT scans – support localisation of language functions
 - *(positron emission tomography / computerized axial tomography)
 - Early research on brain damaged patients
 - Broca (1860s) - identified the existence of a “language centre” in posterior portion of frontal lobe of left hemisphere
 - Aphasia:

Partial or total loss of the ability to articulate ideas or comprehend spoken or written language, resulting from damage to the brain caused by injury or disease

Broca's aphasia – a language impairment caused by damage to the cortical and sub-cortical tissue in the left frontal lobes ('Broca's area')

- Impaired ability to speak: **Laborious, hesitant, non-fluent speech**
- Vocal apparatus undamaged
- Ability to understand language apparently unaffected



Tan's brain
- large lesion in the frontal cortex

Wernicke's aphasia (1874)

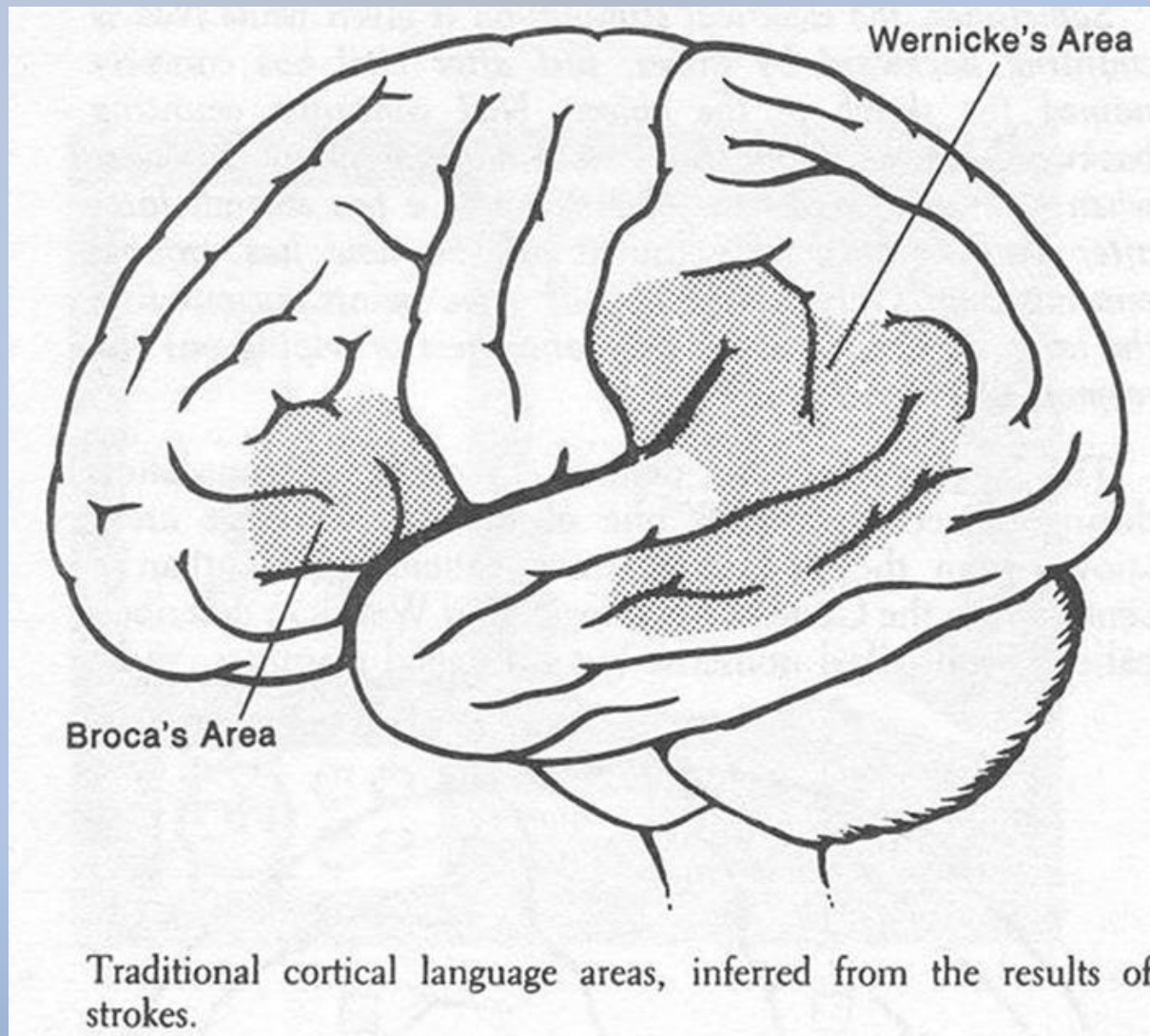
Damage to area further back in left hemisphere

– part of the temporal lobe known as the temporal gyrus

Damage to this area results in:

- Fluent speech that makes little sense (articulate, correct rhythm)
- Severe impairment in ability to comprehend language
- Hearing remains unaffected

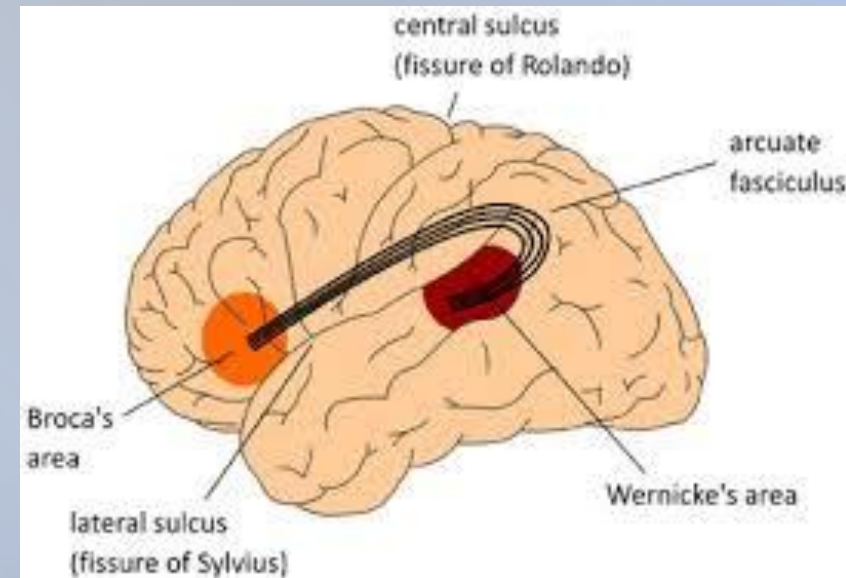




The Wernicke-Geschwind Model

Asserts that

- **Language generation flows from areas at the back to the front of the left hemisphere**
- Hear word - information transmitted from part of cortex responsible for processing auditory information to Wernicke's area
- If speak that word - information flows to Broca's area where articulatory information is activated
- It is then passed on to the motor area responsible for speech





If read a word:

- Visual area of cortex activates angular gyrus and then Wernicke's area

Damage to arcuate fasciculus:

- Difficulties repeating language
- Comprehension and production remain unimpaired
- A disconnection syndrome – connection between two areas damage without damage to the areas themselves



Chomsky's nativist, linguistic explanation of language development

Assumes that language has a structure of grammar that is independent of language use – an independent rule system that determines the sentences that are grammatical or permissible

Grammars consist of a finite set of rules, and this set of rules is shared by all the speakers of that language

The rules allow the generation of an infinite set of mutually comprehensible sentences



Chomsky – argued that language is innate, species specific and biologically pre-programmed

In Chomsky's approach, the component of the brain devoted to language is referred to as the 'language faculty'

This faculty in its initial state is genetically determined and similar across the human species – with the exception of those with serious pathology (Chomsky and Place, 2000)

The theory accounting for this initial state is known as universal grammar

Universal grammar contains the system of grammatical rules and categories common to all the world's languages

For example, English tends to have a *subject-verb-object* grammar

The majority of the world's languages are SVO languages

Welsh is *verb-subject-object*

Object-subject-verb: very rare

“To Dagobah, I must go”





Chomsky (1968) - the language faculty must have at least two components

1. A cognitive system involved in the storing of information

Idealised linguistic competence

Our abstract knowledge of our language

The judgements we would make if we had sufficient time/memory capacity

2. Performance systems that access this information and make use of it in different ways

Actual linguistic performance

Limited by time/memory capacity

Result – errors, hesitations etc.



Proposed that the cognitive system interacts with two performance systems

- The articulatory-perceptual system – (pronunciation)
- The conceptual-intentional – (conceptual system – unique adaptation for communication)



The innate language component traditionally labelled a '*language acquisition device*' or *LAD* (Chomsky, 1965)

Bestows upon the child a host of information about grammatical classes and possible transformations



The LAD operates on raw linguistic data in children's language to produce the particular abstract grammar of the children's native tongue

The innate knowledge must consist of aspects of language that are universal to all languages

Children have the capacity to learn all languages so the LAD cannot be specific



Chomsky's assertions relate to.....

Innate nature of language acquisition

Ability of children to construct language beyond that which they hear in their social world

.....suggests that there is a critical period during which children can best learn language

.....and that children that miss out on this will not be able to learn language fluently (e.g. Genie 'Secrets of the Wild Child')



Criticisms of Chomsky's approach

Chomsky speaks of the core grammar of a language – but this might be because of an historical accident

Aitchison (1983) – we have an inbuilt puzzle-solving capacity, rather than grammar

Chomsky tends to ignore the fact that we don't all speak in grammatically correct sentences even though we're supposed to know what is and isn't correct

LAD? Evidence that language structure is acquired in a piecemeal fashion over many years



Chomsky also focuses on grammar to the detriment of semantics – meaning –
‘colourless green ideas sleep furiously’

Chomsky disregards meaning and the social situation in which language is normally produced. He disregards in particular the situation in which a child learns his first language

Language input to children– fully formed and responsive – so social interactions form the context for language development (Chapman, 2000)

Bruner - Language Acquisition Socialization System (LASS)

Emphasized the importance of the **mother-child dyad** in the child’s acquisition of language

Children learn the language that they have heard their parents speak

Cognitive and Social Explanations of Language



Piaget



Bruner



Cognitive Basis of language

Jean Piaget – developmental psychologist

Cognitive maturation

Stages of development – 4 stages:

- Sensorimotor stage (until approx. 2 years old) - **object permanence**
- Preoperational stage (until approx. 6/7 years old) - **egocentric thought**
- Concrete operational
- Formal operational

Main mechanisms of cognitive development: **assimilation** and **accommodation**



Piaget – nothing special about language – did not consider language a special faculty (unlike Chomsky)

Considered it a social and cognitive process

Language dependent on cognitive, motor and perceptual processes

Development follows cognitive stages of development

Piaget: 3 types of egocentric speech:

- **echolalia**: repeating
- **monologues**: talking to self – speaking thoughts aloud
- **group/collective monologues** – appear to be taking turns to speak, but really just monologues



Cognition Hypothesis

Language needs certain cognitive precursors in order to develop (Sinclair-de-Zwart, 1973)

e.g. Object permanence required to understand the concept of objects and names
- big increase in vocabulary around 18 months

But – Corrigan (1978) – infants can name by 12 months (before object permanence)

However, object permanence argued to be linked to language acquisition:

- emergence of relational words (e.g. up, more, gone) depend on emergence of knowledge about the ways in which object states can be transformed

- these words do emerge together around end of sensorimotor period

(McCune-Nicolich, 1981)



Critique of Cognition Hypothesis

No clear evidence to support the hypothesis and little current research on this

Acquisition of some language abilities before object permanence

Bruner (1964) argued language facilitates cognitive development

Also Vygotsky – believed that experience of local language sets parameters for how people are able to think

But cognitive processes implicated

e.g. working memory capacity increases – might impact upon vocabulary learning and comprehension ability



Social Basis of Language

Social interactionists (e.g. Bruner, Durkin)

Language develops through interaction with others

Adult-child interaction shapes language learning

Adults...

- Talk about events, objects
- Question and correct linguistic errors

Bruner (LASS) – particularly mother-child dyad

Early responses to non-verbal vocalisations

Games based on turn-taking teaches turn-taking in linguistic interactions

Feedback teaches the grammar of a language and specific of dialects etc.



Critique of Social Interactionist explanations

Meaningful social settings crucial for verbal interaction

But – explanations often rather vague and do not account for all aspects of language development

Evidence that innate knowledge is implicated

Likely that social interaction is mediated by cognitive processes



Summary

- Sapir-Whorf hypothesis
- Biological basis of language
 - Broca's aphasia
 - Wernicke's aphasia
 - Wernicke-Geschwind model of language organization
- Chomsky's nativist explanation (LAD), Bruner (LASS)
- Cognitive basis – Piaget
- Social Basis - Bruner



Reading

Gross, R. D. (2010). *Psychology: the science of mind and behaviour (6th ed.)*.

London: Hodder Education.

(Chapter 19. particularly Theories of Language Acquisition)

Harley, T. A. (2014). *The Psychology Of Language: from data to theory (4th ed.)*.

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(Chapter 3: The foundations of language)