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Subject: Psycholinguistics

Psycholinguistics: Areas, Goals, and Other Important Concepts.

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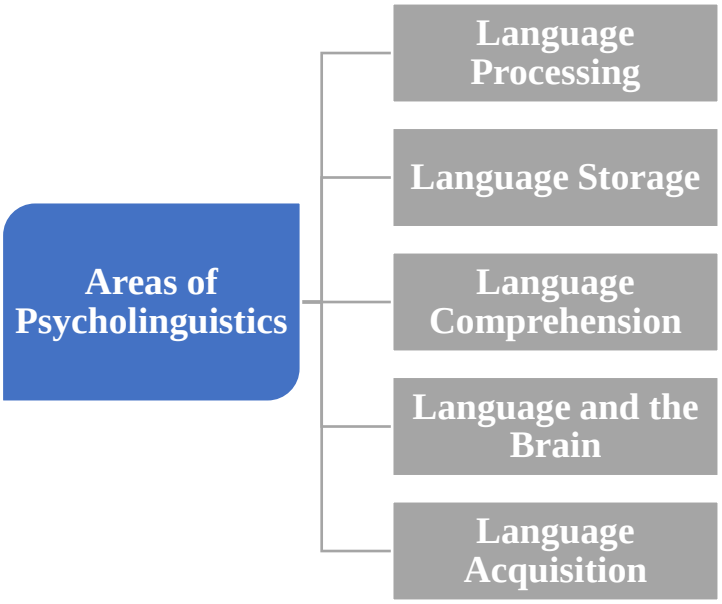
Areas of Psycholinguistics



1. Language Processing: How language is processed in the mind and what exactly goes on when we listen, when we speak, when we read, and when we write.

2. Language Storage: How is language stored in our mind, how is it saved in our memory, how do we retrieve it whenever we want it, and how we keep the information safe in the mind.

3. Language Comprehension: How is meaning constructed, how is meaning derived, how do we form the opinions, and how concepts are formed.

4. Language and the Brain: In other words, we can say neurolinguistics. It is the connection and the deep relationship between the language and the brain; where does the brain store linguistic and semantic concepts and how does the brain save the linguistic and semantic information we receive.

5. Language Acquisition: How do infants come to acquire the first language. Infants start speaking when they reach the age of 6 months or 7 months without having wide social connections. So, what factors contribute to such acquisition?

Goals of Psycholinguistics

1. Describing Real-Time Cognitive Processes

A primary objective is to map the psychological steps involved in everyday language use. According to Miller (1964), this is not a single act but a **hierarchy of processing levels** that transition from the physical to the conceptual:

- **Perception:** Hearing and "matching" auditory signals into phonological patterns.
- **Parsing:** Using implicit generative knowledge to accept strings of words as grammatical sentences.
- **Interpretation:** Combining word meanings (semantics) with situational context to move beyond literal reference to true understanding.

2. Explaining Productivity and Creativity

Humans do not simply retrieve pre-recorded sentences from memory; we generate new ones constantly. Psycholinguistics aims to explain how we handle this unlimited diversity of utterances (Miller, 1964).

3. Investigating the Biological Basis

Psycholinguistics seeks to determine why language is a **species-specific behaviour**. Researchers aim to identify the biological blueprints that enable even individuals with significant cognitive impairments to acquire linguistic fundamentals (Miller, 1964).

4. Bridging Acquisition and Universal Design

To understand how children acquire their first language without formal instruction. This involves identifying **linguistic universals**—features like pronouns and tense that appear in all human cultures. By studying these, psycholinguists attempt to resolve whether our linguistic ability stems from an innate "Language Acquisition Device" or from general cognitive learning mechanisms (Harley, 2014).

5. Practical and Scientific Integration

Beyond theoretical knowledge, the field aims for "cybernetic possibilities" and medical breakthroughs. These include:

- **Clinical Applications:** Diagnosing and treating language disorders like aphasia or stammering.
- **Pedagogical Improvements:** Refining how we teach reading, writing, and second languages.
- **Artificial Intelligence:** Implementing explicit linguistic principles into computing machines (Miller, 1964).

LANGUAGE, SPEECH AND COMMUNICATION

We need to distinguish between communication, language and speech. The first includes the second and the second includes the third.

Communication

The term covers any means by which two individuals exchange information. While language is one type of communication, it is not the only one.

Human beings can convey ideas and feelings by means of many devices, among them hand signals, facial expressions, body language, nods, smiles and winks. These paralinguistic techniques do not involve vocalisation. However, there are other non-linguistic means of communication which do involve vocalisation such as grunts and groans, for example. The examples just given are voluntary: they are under the control of the user.

Language

Language has four important characteristics:

- Language is voluntary. It is under our individual control.
- Language is symbolic. It represents something other than itself.
- Language is systematic. In terms of vocabulary, this means that words operate in sets, dividing up an area of meaning between them. In terms of grammar, language is structure-dependent, with words combining into phrases and phrases combining into sentences.
- Language operates in two different modalities: speech and writing. Of the two, speech is regarded as primary.

Speech

Speech may be characterised by the fact that it involves vocalisation. Two factors determine the ability of the language user to produce speech-like sounds:

A) The shape, size and position of the articulators that we use.

B) The ability to breathe and utter sounds at the same time. Human beings are able to exercise much greater control over their breathing than most other species.

Speech usually involves the communication of a message. However, there are two types of speech which we might regard as less 'meaningful' than others:

1. **Expletives** such as Oh! to express surprise or Ow! to express pain. Can we regard these as 'words'? Are they involuntary rather than intentional?

2. **Phatic utterances** such as Nice day! where we may not intend to communicate a specific meaning and may not anticipate any response.

LANGUAGE AND THE BRAIN

Three important issues emerge in relation to language and the brain.

Comparison

From a **nativist** perspective, the rapid and successful acquisition of language by human infants suggests the existence of a genetically transmitted language faculty, implying structural differences between the human brain and those of species incapable of language. From a **cognitivist** perspective, it is argued instead that differences in how the human brain operates enabled language to evolve in humans but not in other species.

Localisation

Localisation concerns where language is located in the brain. Interest in this question increased after Chomsky and others noted that all normal children acquire a first language regardless of intelligence or learning style, leading some to propose that language is an independent faculty rather than part of general cognition.

Lateralisation

Lateralisation examines whether the left and right hemispheres contribute differently to language and when this distinction develops. Early evidence showed that damage to the left hemisphere typically impairs language, unlike damage to

the right. If such damage occurs before about age five, recovery of speech is sometimes possible, suggesting that in early childhood the brain is flexible enough for language to shift to the right hemisphere. This flexibility led to the idea of a Critical Period for first-language acquisition, after which full competence may not be attainable.

A quick geography of the brain

1. Upper vs lower

The upper surface of the brain consists of 'grey matter' (that is its colour when exposed to air) known as the cortex. It deals with the more complex operations, including making connections with stored information, analysing input and controlling sophisticated muscular movements.

In general, the lower parts of the brain are responsible for reflex actions, controlling functions such as breathing and heart beats. The cerebellum at the base of the brain has a delicate role in co-ordinating a range of muscular movements which have become highly automatic.

2. Left vs right

The brain divides into two hemispheres, left and right. They are joined by a complex web of nerve connections known as the corpus callosum. The left hemisphere controls movement and sensation on the right side of the body while the right hemisphere is linked to the left side. If we Generalise, the left hemisphere is associated with analytic processing, while the right is associated with perceptual and spatial representation.

3. Front vs back

The outer surface of the brain is marked by mounds (gyri) and valleys (sulci). These serve to mark out four major regions in each hemisphere, known as lobes. They are the frontal lobe at the front, the temporal lobe running from front to back and the occipital and parietal lobes at the back.

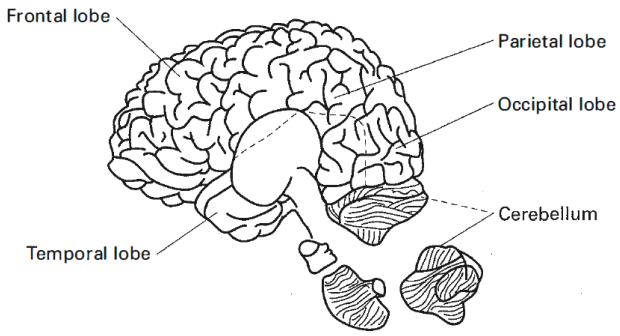


Figure A3.1 The lobes of the brain
Source: Based on 'The parts of the central nervous system' (Kandel & Schwartz, 1981)

Especially important are the pre-frontal areas, which appear to be responsible for categorisation of objects. Damage in these areas may reduce the ability to choose between alternatives. It may also limit the ability to perform tasks that involve seeing things from the perspective of others.
A narrow area controlling motor operations (i.e. muscular movements) runs about midway down the side of each hemisphere.

Comparisons

Here are some comparisons between the brains of human beings and those of other primates:

- The cortex is much more extensive in human beings.
- Human pre-frontal areas are up to six times bigger than those of chimpanzees.
- The brains of other species are divided into two hemispheres. Like human beings, a number of species (birds, rodents) have a left hemisphere which is more developed.
- In human beings, a greater proportion of the motor area is given over to the control of mouth, tongue and jaw.
- The human cerebellum is very much larger than in other species.
- The motor areas in the human cortex appear to exercise a high degree of control over the larynx, which regulates the passage of air in breathing and speech. In other species, the operation of the larynx is mainly or entirely controlled by the lower parts of the brain.

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