

Psycholinguistics

Lecture 6

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The biological foundations of language/ Native language development

Lecture Objectives

This lecture helps students to understand how language is processed in the brain in addition to native language development



Introduction

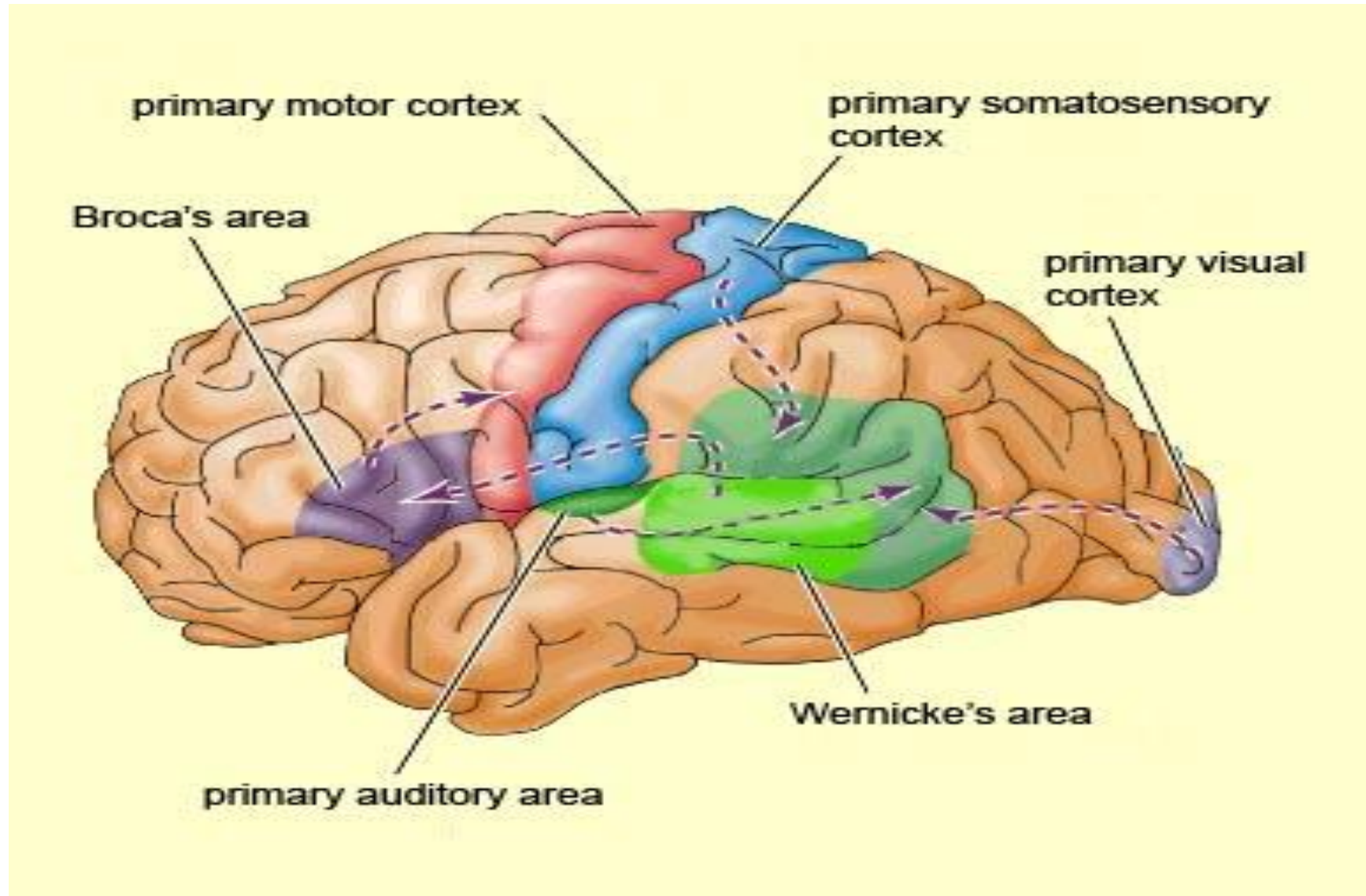
Human linguistic ability does not only primarily depend on the structure of the vocal cords as other mammals also have them, but mainly on the structure and dynamics of the human brain, in which one particular part of the left half is larger than the corresponding part of the right half. The study of languages and the brain is based largely on the framework provided by neurolinguistics, which seeks to answer questions about how the location and organization of language might differ in the heads of monolingual versus multilingual speakers (Troike, 2006, p. 67). In addition to neurolinguistics, this lecture intends to make the students know the different steps involved in first language development.




1. Languages and the brain

- Notions that particular locations in the brain may be specialized for language functions date back at least into the 19th century.
- Paul Broca (1861,1865) observed that in the left frontal lobe (Broca's area) appeared to be responsible for the ability to speak and noted that an injury in that part result in language loss than was an injury in the right part.

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- Wernicke (1974) further identified a nearby area which is adjacent to the part of the cortex that processes audio input (Wernicke's area) and also being central to language processing.
 - For the vast majority of individuals, language is represented primarily in the left half (left hemisphere) of the brain within an area (including both Broca's area and Wernicke's area) around the Sylvian fissure (a cleavage that separates lobes in the brain).



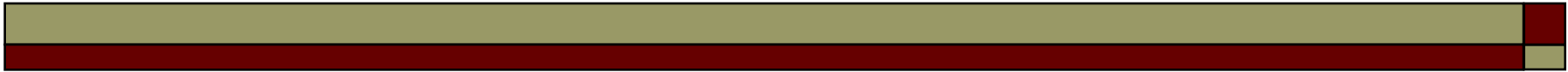


Specialization, or the localization of cognitive and perceptual functions, of the two hemispheres is known as **lateralization**.

Principal communicative specialization of left and right hemispheres

(Troike, 2006,p. 69)

Left hemisphere	Right hemisphere
Phonology	Nonverbal (as babies' cries)
Morphology	Visuospatial information
Syntax	Intonation
Function words and inflections	Nonliteral meaning and ambiguity
Tone systems	Many pragmatic abilities
Much lexical knowledge	Some lexical knowledge



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- ❑ On the one hand, The left hemisphere has primary responsibility, being more powerful than the right one and therefore, better suited for the highly complex elements of language such as being responsible of language and speech, analytical reasoning, temporal ordering, reading and writing, calculation and associative thought.
 - ❑ On the other hand, the right hemisphere is responsible of perception of nonlinguistic sounds and musical melodies.



Native language development

Research on first language acquisition is relatively recent. In the 1960s, Noam Chomsky introduced the idea of an innate competence that all children have and argued that the language development of a child is largely innate.

However, researchers are still debating on how much first language acquisition is innate or due to nurture or imitation . This part will focus on first language development in children, especially in early stages, but before that, it important to remember language theories



Theories of Language Acquisition

1. Behaviorist Theory

Language is learned through environmental conditioning and imitation of adult models.

2. Nativist Theory

Language is native, natural, and innate to human beings. Every child is born with a “built-in” device for acquiring language.

3. Interactionist Theory

Language is a product of both genetic and environmental factors.

3 Theories of Language Acquisition

- Learning Theory - We acquire language through rewards and punishments, and observation and imitation (Bandura).
- Nativist Theory - Noam Chomsky's theory. He believes language results from a more complex process than simple learning.
 - Children produce sentences they have never heard. (over and underextension of words and endings)
 - Humans have a Language Acquisition Device (LAD) -- we are programmed to recognize the universal rules of language. As children develop, their LAD matures, which explains the increased pace of linguistic development.
- Interactionist Theory - emphasizes that language is a social process. We have not only an LAD, but also an LASS (Language Acquisition Support System).
 - Communication between adults and children through specially formatted games and activities creates an environment for children to learn language. (peekaboo, bedtime routines, etc.)
 - Maternal communication as LASS
 - Positive correlations between maternal responsiveness to child vocalizations, the use of motherese and other simplified language, the amount of time talking to the child, and number of different words used with children after age two



OVERVIEW OF THE NORMAL DEVELOPMENT OF LANGUAGE

- As the speech mechanism (jaw, lips and tongue) and voice mature, an infant is able to make controlled sounds.
- By 6 months, an infant usually babbles or produces repetitive syllables such as "ba, ba, ba" or "da, da, da."
- By the end of their first year, most children have mastered the ability to say a few simple words.
- By 18 months of age, most children can say eight to ten words.
- By age 2, most are putting words together in crude sentences such as "more milk."
- At ages 3, 4, and 5, a child's vocabulary rapidly increases, and she or he begins to master the rules of language.



Speech, Language and Communication Development Chart

Age	Attention and Listening	Understanding (Receptive language)	Communicating (Expressive Language)	Social Communication and use of language	Speech Sounds	Play
0-11 months	<ul style="list-style-type: none"> • Turns towards sounds and locates a range of sounds accurately • By 6m can pay fleeting attention but easily distracted by new event • Stops and looks when hears own name • Is intrigued by new events and actions • Listens to, distinguishes, and responds to intonations and the sounds of voices 	<ul style="list-style-type: none"> • By 6m responds to different tones of voice • Recognises parent's voice • By 10m stops and looks when hears own name • By end of 1st year, begins to understand frequently used words such as "all gone", "bye bye", "no" • Understands single signs 	<ul style="list-style-type: none"> • Communicates in a variety of ways including smiling, gurgling, crying, making sounds • By 6m will engage in sound play with familiar adult • Babbling in strings of connected but different sounds, e.g. 'ba-da-ga' • By 12m, may hear "word" like utterances e.g. "dada", "mama", "gogo" • Can point to object or activity to express wants and needs • May have 1 -5 "words" by 12m, related to child's own world and functional needs 	<ul style="list-style-type: none"> • Gazes at faces and copies facial movements e.g. sticking out tongue • Makes sounds with their voice for social interaction • By 12m uses voice, gesture, eye contact & facial expression to make contact with people and keep their attention • Initiates an interaction with adult 	<ul style="list-style-type: none"> • Babbles with range of sound combinations • By 12m consonants such as "b, d, g, m, n, w" predominate 	<ul style="list-style-type: none"> • Exploratory play; mouths, bangs, shakes objects • By 12m, relates 2 objects, e.g. spoon in cup • Plays alone with toys
8-20 months	<ul style="list-style-type: none"> • Likes to listen to a wide variety of sounds • By 12m concentrates on most powerful stimulus, difficult to re-focus • Is easily distracted by noises or other people talking • By 18m will attend to own choice of activity, tolerates limited intervention 	<ul style="list-style-type: none"> • By 12m understands key words in phrase e.g. "Where's your <u>nose</u>?" • By 12m recognises photos of familiar people and objects • Understands simple words in context and understands more than they can say • Understands naming words e.g. <i>shoe</i>, <i>ball</i> 	<ul style="list-style-type: none"> • Creates personal words as begins to develop language • Uses around 10-20 single words although these may not be clear • Beginning to use words for a range of purposes 	<ul style="list-style-type: none"> • Likes being with familiar adults and watches and copies their body language including gesture and pointing • Realises that their voice and actions have an effect on others • Use pointing with eye gaze to share an interest and make a request 	<ul style="list-style-type: none"> • Speech consists of mix of "jargon" and some real words • May be difficult to understand 	<ul style="list-style-type: none"> • Repeats actions that were enjoyed • Begins "pretend" play with toys e.g. gives doll a drink • Involves others in pretend play
16-26 months	<ul style="list-style-type: none"> • Listens to and enjoys rhythmic patterns in rhymes and stories • Starts to focus on an activity of own choice • Responds to own name and can move attention briefly and then re-focus • Single channelled attention 	<ul style="list-style-type: none"> • Understands action words e.g. "sleep", "jump" • By 2y, understands simple instructions/phrases when context apparent, e.g. "get mummy's shoes" • Understands instructions with 2 key words (or signs) e.g. "make <u>teddy jump</u>" 	<ul style="list-style-type: none"> • By 24m beginning to put 2 words(or signs) together e.g. "Mummy's car", "more juice" • Uses different types of everyday words, nouns, adjectives, verbs • Uses up to 50 words • Asks questions e.g. "where drink?" 	<ul style="list-style-type: none"> • Interested in stories, songs and rhymes • Begins to express feelings 	<ul style="list-style-type: none"> • By 2y6m starting to use "f, s, sh" • Immaturities heard e.g. "tar" for "car" "pu" for "spoon" 	<ul style="list-style-type: none"> • Starts to demonstrate 2 part play sequence e.g. drives car to petrol station + fills petrol • Beginning to play with miniature toys e.g. small world

Phases and processing Systems, and Neural and cognitive Mechanisms, associated with the development of linguistic capacity, along with the corresponding areas of language (Locke,1995)

Age of onset	Developmental phases and systems	Neuro cognitive mechanisms	Linguistic domains
Prenatal	Vocal learning	Specialization in social cognition	Prosody and sound segment
5-7 months	Utterance acquisition	Specialization in social cognition	Stereotype utterances
20-37 months	Analysis and computation	Grammatical analysis mechanism	Morphology Syntax Phonology
3+ years	Integration and elaboration	Social cognition and grammatical analysis	Expanded lexicon, automatized operations


Normal language development


<i>Age</i>	<i>Language milestone</i>
0-3m	cooing
4-20m	from babbling to words in L1/L2
21-36m	acquisition of structure of L1/L2
3-10y	grammatical refinement & expansion of vocabulary of L1/L2
11-14y	foreign accent in L2
15y +	L2 is increasingly difficult



Orientation to speech


Language development doesn't begin does not begin with the child's effort to learn material that is linguistic. Rather, it begins with processes that orient the infant to the behavior of talking people, and bias the infant to attend and respond to certain aspects of such behavior (Locke, 1996, 1997). The infant's responsiveness to facial and vocal activity is presumed to be heavily influenced by genetic factors as well as experience and is supported by specific neural preadaptations(ibid.)

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- This set of neural and cognitive supports constitute a specialization in social cognitive.
 - At the most general level, this specialization supports an affectively oriented development growth path that channels infants in the direction of spoken language. More specifically, socially cognitive mechanisms orient infants to linguistic display- the physical activity of people talking- thus providing information about language (Locke, 1993b, 1995).



Research in the past several decades has identified many of the socially cognitive operations that seemingly facilitate vocal learning and early word production. These include the infants disposition to:

- Take vocal turns with a partner
- Orient to and mimic variegated prosody
- Gesture communicatively
- Assimilate ambient phonetic patterns
- As they develop (a theory of other minds', seek to interpret and alter the mental activity of other interlocuters)

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- With relevant perceptual experience and motor development, these operations allow infants to ‘get by’ in their native language, to pass as speakers when their linguistic capacity is still immature. The infant’s socially cognitive operations therefore contribute to the first few essential phases in the development of linguistic capacity.

References

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