

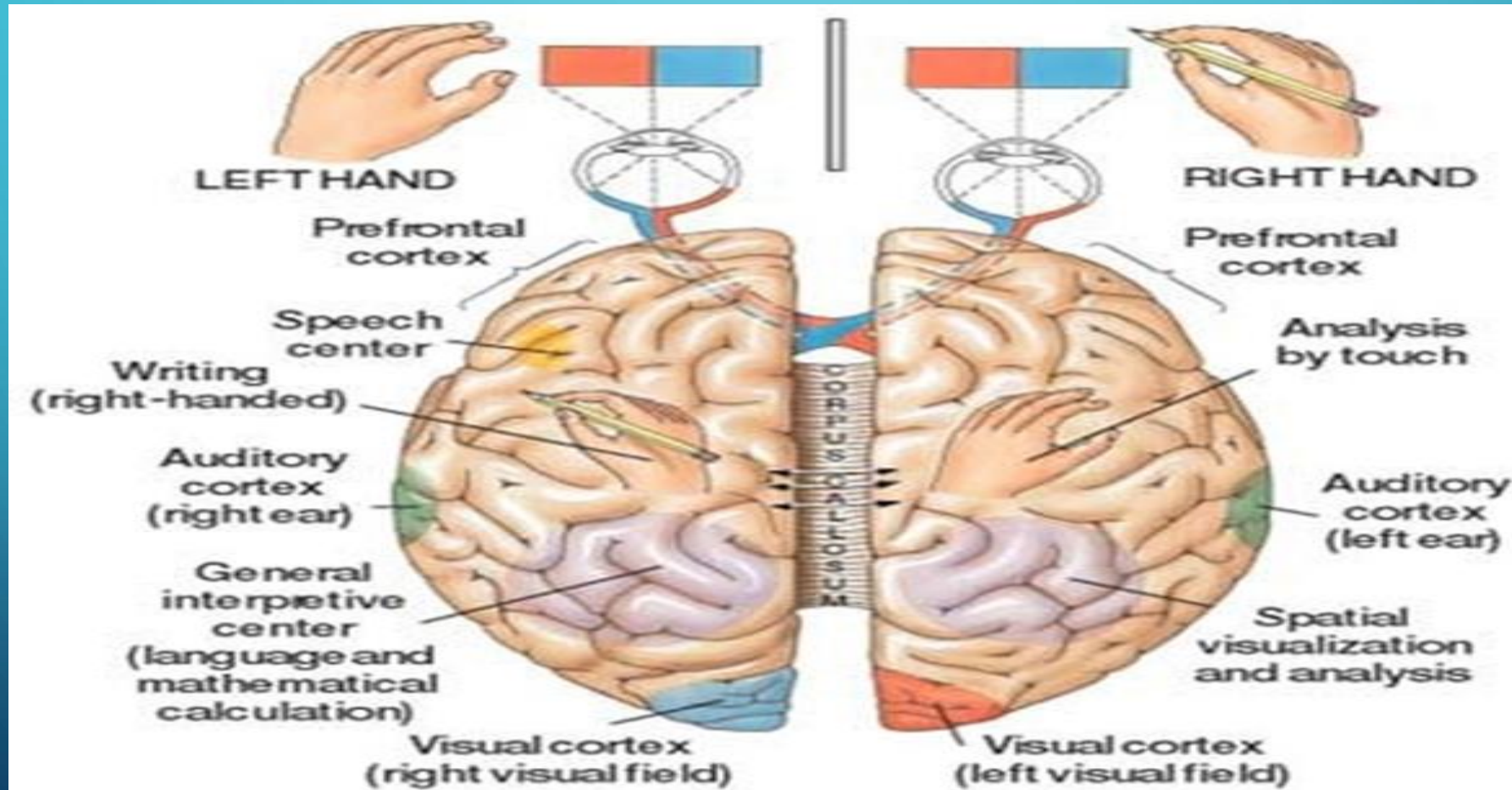


# PSYCHOLINGUISTICS

## LECTURE 10

### SPLIT BRAIN

# STUDY THE PICTURE CAREFULLY



# SPLIT BRAIN

As already stated, human brain consists of two HEMISPHERES: the left hemisphere and the right hemisphere which are linked by a network of fibers called CORPUS CALLOSUM (see 1<sup>st</sup> slide). The prime function of corpus callosum is to act as a linking bridge between the two halves of brain.



## SPLIT BRAIN CONT...

- However, sometimes the linking fiber (corpus callosum) gets disconnected due to stroke or accidents that cause damage to the brain. Besides, in some cases Surgeons cut down the linkage during surgical operations when it is unavoidable for the protection of patient's life which results in a brake-down in the process of communication between the two hemispheres.





# CONT...

- When the communication is cut off, the two halves of the brain have no communication and they function as two separate organs that have no link in them. Such condition is called SPLIT BRAIN.
- In case of split brain the patient will no more remain normal in language point of view. He or she will not be able to recognize the things the way a common human being can do.
- [Click on the given link to see a video about split brain.](#)
- <https://www.britannica.com/video/163007/corpus-callosum-structure-left-brain-hemispheres-split-brain>

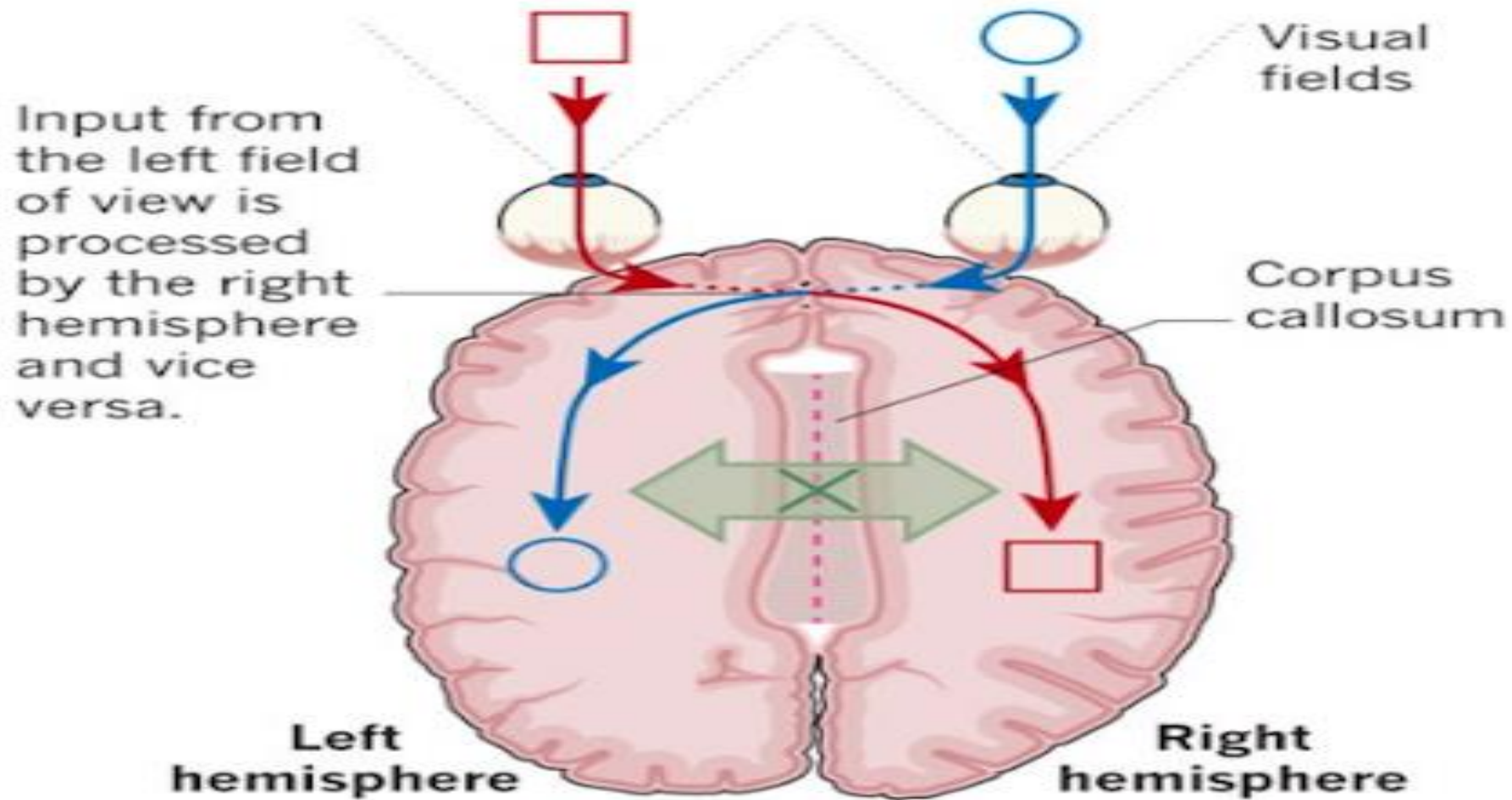
# RESULTS OF SPLIT BRAIN

- In case of a split brain the patient will no more remain normal in the field of language because his language centre is disconnected with right hemisphere and the happenings on the right side cant be transferred to language processing area.
- For example:
- If a pen is placed in the left hand of a split brain person whose eyes are closed, the person will be able to use the pen well but cant name it because the process is not transmitted to language processing area located in the left hemisphere.

## CONT...

- Because only left hemisphere can speak and the event has taken place in the left side of the body which is processed in the right hemisphere.
- In fact the right hemisphere senses the pen but the message cant be sent to the left hemisphere.
- By contrast, if the pen is placed in the right hand, the person can name it and use it well because the event is taking place in the right side of the body and the sensory impulse directly goes to the left hemisphere that can speak.
- [Click on the given link to see a video of a split brain patient.](https://parker.coloradoearlycolleges.org/apps/video/watch.jsp?v=135514)
- <https://parker.coloradoearlycolleges.org/apps/video/watch.jsp?v=135514>

Split-brain patients have undergone surgery to cut the corpus callosum, the main bundle of neuronal fibres connecting the two sides of the brain.





# RESULT OF SPLIT BRAIN

10:00 to the left hemisphere

Split Brain Person

11:00

L R

12:00

Eyes are closed

13:00

Happening = R-Hand

Message = L Hemisphere

14:00

can use & name the object now

15:00

16:00

Dichotic listening - A sound testing technique in

Split Brain Person

L R

Eyes are closed

Happening = L Hand

Message = Right Hemisphere but can't be sent to L hemisphere

can use but can't name the obj.

# TOP-DOWN-PROCESS

- Top-down process proceeds from syntactic and semantic information to the sensory input. Hence, through the use of such information, one can predict what to follow in the signal.
- For example:
- If one listens the determiner “a”, based on one’s syntactic knowledge, one can predict that the coming word will be a singular noun beginning with a consonant sound. For example: A boy.

## CONT...

- Here the operation takes place in different levels:
- **SYNTACTIC:** syntactic knowledge supports that the coming word should be singular noun to form a noun phrase.
- **PHONOLOGICAL:** phonological knowledge tells us the coming morpheme should begin with a consonant sound.
- **SEMANTIC:** semantic knowledge tells us what does the being used morpheme 'a' mean.

# BOTTOM-UP PROCESSING

- Bottom-up processing moves step by step from the incoming acoustic/sensory input to semantic interpretation, building each part of the structure based on the sensory data alone. The speaker doesn't use his prior linguistic knowledge to determine as to what will be the following element.
- According to this model, the speaker waits until he/she hears "a boy" and then constructs noun phrase.



# LEXICAL ACCESS AND WORD RECOGNITION

- It is a process by which we obtain information about a word, its meaning and syntactic properties from our mental lexicon.
- For example:                   the word   “but” is:
  - A) it is a conjunction.
  - B) it means the other way or in contrast.
- Lexical access or word recognition is a process that involves many processes:

# EXAMPLE

- A string of letters is shown to the respondents to recognize if it were a word or not.
- The respondents would press a green button if it were a word and they would press a red button if it were not. So they make a decision which is called **LEXICAL DECISION**.
- Certainly the respondents cant reply without thinking and this process of thinking takes time often called **RESPONSE TIME OR REACTION TIME (RT)**

## CONT...

- RT depends on the frequency of the stimulus.
- If it is a common word, it may take a little time as compared to un common word.
- For example:
  - tree (common and low frequency word)
  - Unfathomable (uncommon and high frequency word)

# SEMANTIC PRIMING

- Semantic priming refers to a sense relation between two words. Making a lexical decision on a word 'book' is faster on 'pen' than on unrelated word 'stone' for the book and pen are related than the book and stone.
- Hence RT for "book and pen" will be fast than the "stone and book". This effect is called 'SEMANTIC PRIMING'.
- We can say that book primes pen more than stone.



# MINIMAL ATTACHMENT

- Minimal attachment says build a simplest structure consistent with the grammar of the language.
- For example: She cooks food.
- 'She' is the subject and 'cooks' is verb in this sentence.
- It is not a synthesis of the sentence rather an approach to the sentence construction.

# SCHEMA

- The term schema refers to a collection of organized and interrelated ideas, concepts and prior knowledge structures that are abstract representations of objects, events and relationships in the real world.
- In linguistics one's prior knowledge is termed as schema. The more you are experienced, the more strengthen and extended schema you will have.

## EXAMPLE:

- If someone says “I am going to take tea in the canteen”, you can understand that he will go out and walk for canteen where he will sit in a chair. Next he will order the table-man for a cup of tea. After the taking tea, he will pay money at the counter and then leave the canteen.
- In fact, the man has not told you all these steps rather your prior knowledge and past experience enable you so. It is your schema.
- In fact, stories consist of a setting in which the time, place, and characters are identified, followed by episodes leading towards a reaction.

# CONTENT SCHEMATA AND FORMAL SCHEMATA

- A difference is sometimes made between **content schemata** and **formal Schemata**:
- Content schemata deal with general background knowledge related to the topic such as might be associated with the topic of *an earthquake*.
- Formal schemata deal with the rhetorical structure of language and a person's knowledge of the structure of a particular genre, such as *news etc*.



# SCHEMA THEORY

- The theory that in comprehending language people activate relevant schemata allowing them to process and interpret new experiences quickly and efficiently. Schemata serve as a reference store from which a person can retrieve relevant existing knowledge and into which new information is assimilated.
- When encountering a topic in reading or listening, the reader activates the schema for that topic and makes use of it to anticipate, infer, and make different kinds of judgements and decisions about it.
- Schema theory plays an important role in theories of second language reading and listening comprehension.