Language Comprehension

1. Understanding Language

- Comprehension involves integrating sounds, letters, spelling, grammar, and knowledge of the world.
- It relies on **cognitive functions** like **attention**, **memory**, and **inference-making** to make sense of language.
- Most people process language naturally, but individuals with **dyslexia**, **speech impairments**, or **brain injuries** face challenges.

2. Brain and Language

- Language is mostly processed in the **left hemisphere**:
  - **Broca's area**: Frontal lobe, involved in speech production and planning.
  - **Wernicke's area**: Temporal-parietal junction, responsible for language comprehension.
  - **Angular gyrus**: Links visual input (e.g., reading) to language.
  - **Arcuate fasciculus**: A nerve fiber bundle connecting Broca's and Wernicke's areas.
  - **Heschl's gyrus**: Processes auditory input.
  - **Exner's center**: Likely involved in the motor control of writing.
  - **Right hemisphere**: While not dominant, it may support language tone, rhythm, and emotion.

3. Language Processing Routes

- **Speech**:
  - Begins in Wernicke's area (form meaning).
  - Sent to Broca's area to generate motor instructions for speaking.
- **Reading Aloud**:
  - Starts in the visual cortex (processing written input).
  - Passes through the angular gyrus to Wernicke's area for meaning.
  - Then to Broca's area for motor speech planning.
- **Listening**:
  - Auditory input goes to the auditory cortex.

    - Then interpreted by Wernicke's area for meaning.

4. Cognitive Contributions

- Effective comprehension needs:
    - **Memory**: Storing and retrieving meanings.
    - **Attention**: Focusing on relevant language signals.
    - **Experience**: Shapes how easily we interpret meaning.
- **Denotation**: Literal, dictionary meaning of a word.
- **Connotation**: Cultural, emotional, or personal associations that vary by context.

5. Components of Language Processing

- **Speech Processing**: Decoding sound into linguistic units.
- **Lexical Processing**: Recognizing words and accessing their meanings and grammatical roles.
- **Sentential Processing**: Building sentence structure from syntax and context; involves working memory.
- **Discourse Processing**: Linking multiple sentences for overall understanding; includes inference and coherence building.