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Title: Speech processing – Homework 1

1. What is Speech Production?

Speech production is the process through which humans generate spoken language. It involves a series of coordinated steps that transform thoughts into audible speech. This process includes:

- **Conceptualization:** Deciding what message or idea to communicate.
- **Formulation:** Choosing the right words and organizing them into sentences.
- **Articulation:** Physically producing sounds using the vocal apparatus, such as the lungs, larynx, tongue, and lips.
- **Self-monitoring:** Listening to one's own speech and making adjustments as needed.
- Speech production relies on the brain's language centers (like Broca's area) and precise motor control to create sounds that convey meaning effectively.

2. What is Speech Perception?

Speech perception is the process by which humans interpret and understand spoken language. It involves the auditory system and brain working together to make sense of the sounds we hear. Key stages include:

- **Auditory Processing:** Detecting sound waves through the ears.
- **Phonetic Analysis:** Identifying individual speech sounds (phonemes).
- **Phonological Processing:** Mapping sounds to language-specific categories.
- **Lexical and Syntactic Processing:** Recognizing words and understanding sentence structure.

Factors like context, the speaker's voice, and the listener's language experience influence how speech is perceived.

3. What is the Relationship Between Speech Production and Speech Perception?

Speech production and speech perception are deeply interconnected, influencing each other in a bidirectional and interdependent way:

- **Production Affects Perception:** The way we produce speech can shape how we hear it. For instance, being able to articulate specific sounds may make us more attuned to those sounds when others speak. Some theories even suggest that we use our knowledge of speech production to understand what we hear.
- **Perception Affects Production:** How we perceive speech can influence how we speak. Hearing different accents or speech patterns can lead us to adjust our own pronunciation. Plus, listening to ourselves while speaking helps us correct mistakes on the fly.
- **Shared Brain Connections:** Both processes involve overlapping areas of the brain, like the auditory cortex and motor regions, showing how closely linked they are.

In short, speech production and perception work together seamlessly, supporting each other to enable effective communication and language development.