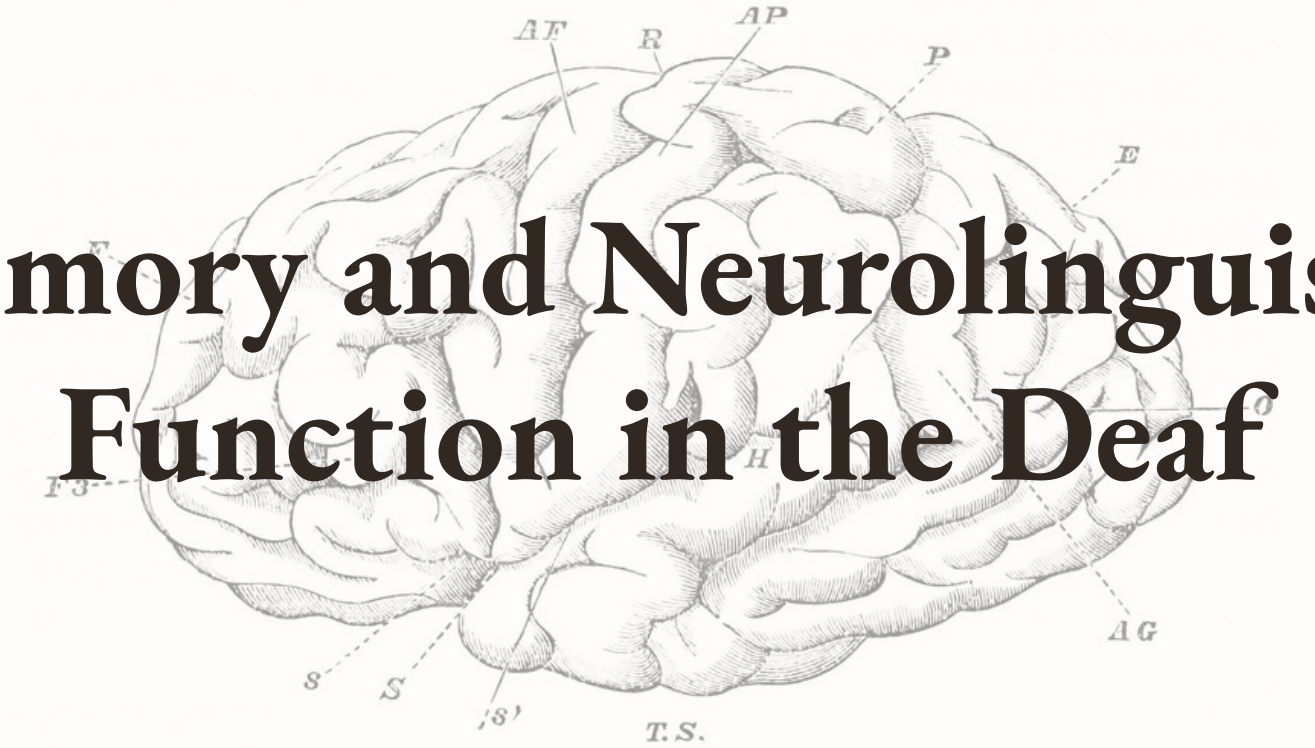

Memory and Neurolinguistic Function in the Deaf

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Purpose

- To study the role of phonemic elements in the interaction between lexemes and memory through the Deaf community's relationship with language
- To revise questions on and develop insight into cognitive processes that influence Deaf memory
- To depart from the hearing canon and explore a broader spectrum of language perception
- To propose a revised Deaf language production model based on what we have learned

This paper will *not* attempt to determine whether the Deaf or the hearing have better memories.

Questions to consider

- How do the Deaf perceive and produce language?
- How does a hearing perspective, bias, or discrimination influence research on Deaf language production?
- How do we proceed in this domain of study?

Methodology

- Exploring phonological importance
- Analyzing memory tasks where the Deaf perform better than the hearing to discover what processes facilitate that strength
- Comparing studies on American Sign Language (ASL) and Japanese Sign Language (JSL)
- Creating a revised Deaf language production model

Key terms

Simultaneous Communication (SimCom): dual encoding of both orthography and signs

ASL: American Sign Language

JSL: Japanese Sign Language

Logogens: A representation of a word or other verbal unit in long-term memory, “activated by speech sounds, writing, or an object” (Oxford)

Visuospatial memory: Memory used to "identify, integrate, and analyze space and visual form, details, structure and spatial relations" (Oxford)

The importance of phonetics

- Phonetics have been seen as crucial to language acquisition and production
- Dijkstra et al.'s "Recognition of cognates and interlingual homographs: The neglected role of phonology"
    - phonology plays a mediating role when orthography is different
    - phonological similarity between interlingual words = inhibitory contribution to reaction time for bilinguals
- Phonetic role in linguistic concepts: Cohort model
    - Speech perception
    - Speech production
    - How this translates to Deaf language perception and production

Rethinking speech perception in the Deaf

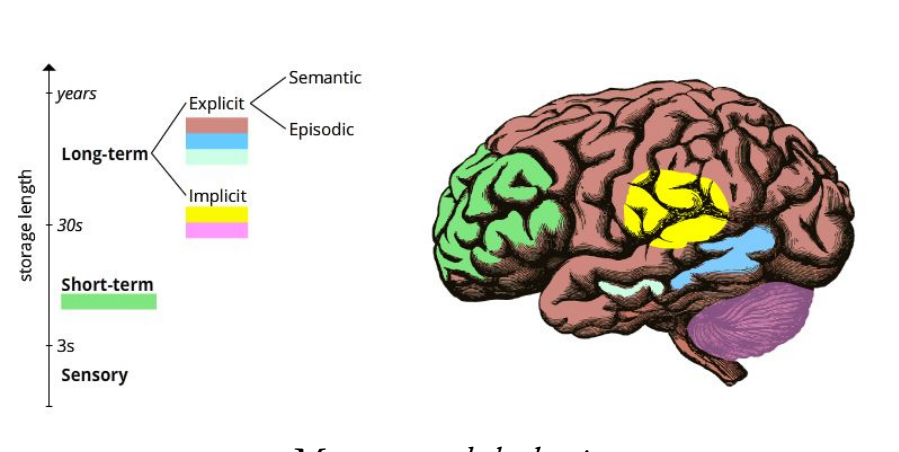
- How would the Cohort model function without acoustic stimulus?
  - inhibitory factors of homophones and false friends are eliminated
  - Cohort model does not account for or represent all modes of communication
- Form's role
  - Orthography and phonology replaced by orthography and signs
- Simultaneous Communication
  - likened to a hearing person's bilingualism because of the two combined, simultaneously activated lexicons
  - dual encoding accounts for slower orthographic word recognition and processing speed
- Memory load
  - In the Deaf and the hearing: memory ↑, performance ↓

How a hearing standard affects Deaf communication

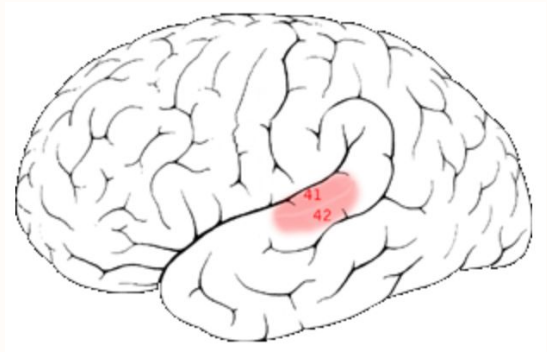
- Lack of "accessible linguistic interaction with other signers and less than sufficient assistance [for] Deaf children during the language learning period" (Hamilton 408)
- Audism
  - Forcing lip reading or speech onto a Deaf person
- The assumption that the only difference between Deaf children and hearing children is an ability to perceive sound
  - Neurocognitive discrepancies between the Deaf and the hearing
  - Deafness is not a learning disability
    - Education must also support the Deaf, otherwise systemic biases towards the hearing will enforce the incorrect notion that the hearing are "superior"

Aspects of memory bolstered in the Deaf

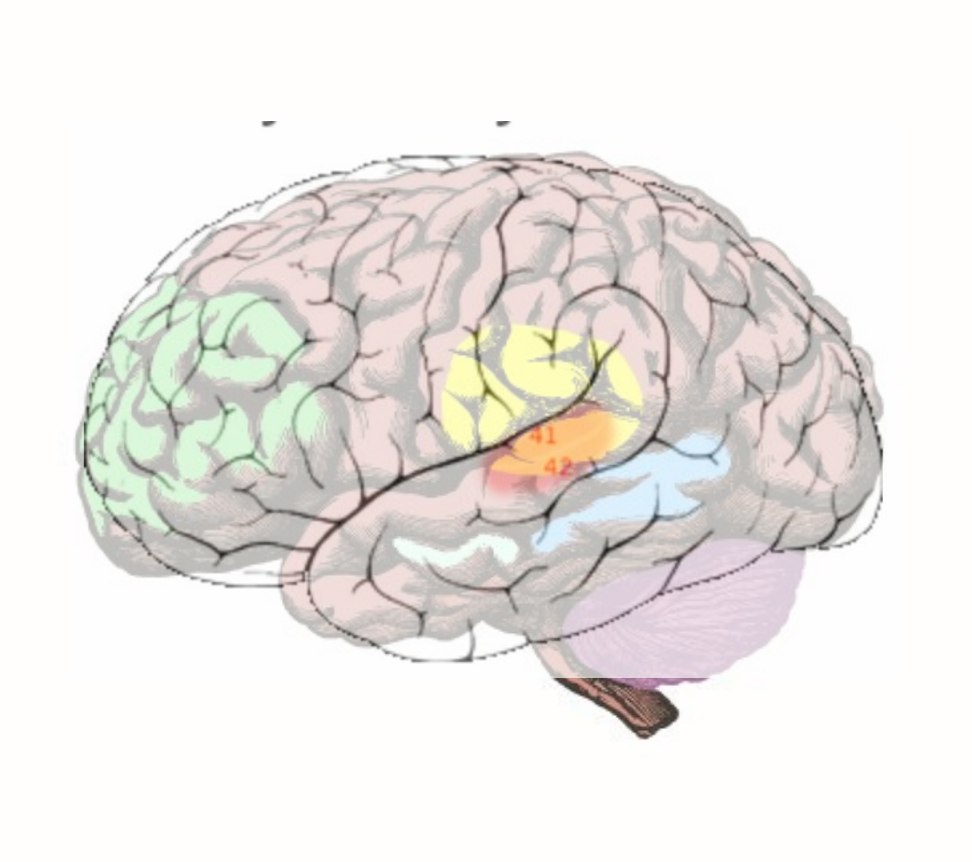
- Visuospatial memory
- Auditory cortex becomes part of cognitive processing
    - Explains highetened locative and visual movement
- Performed in a superior way regarding recall of visual patterns and successive figures



Memory and the brain



The auditory cortex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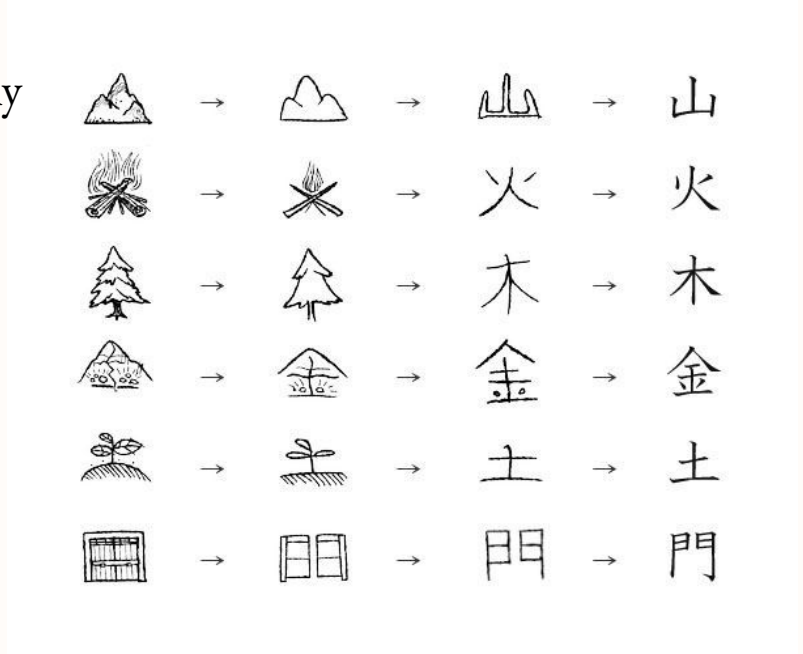
Comparing JSL and ASL

Japanese

- Alphabets have no connection between orthography and phonology
- Meaning-based rather than sound-based
    - In essence: sign language
- 2,000+ kanji



English

- Inseparable connection between orthography and phonology
- Sound-based
- 26 letters

Comparing JSL and ASL, continued

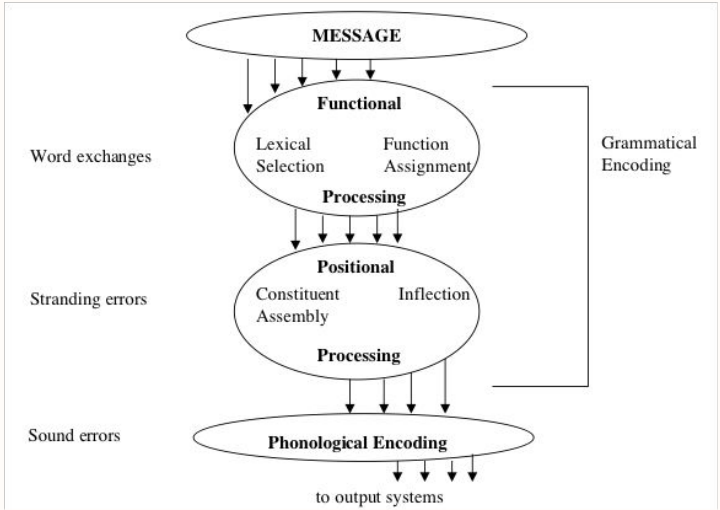
- Flaherty and Moran's 2004 study
  - sequential memory in deaf and hearing students speaking English or Japanese
- Two experiments conducted
  - participants were tested first on a series of words, then on abstract lines and shapes
  - in both experiments, the Japanese participants outperformed the English
- The Japanese-speaking and the English-speaking used different strategies
  - Japanese-speaking: seeing sequence as a whole
  - English-speaking: seeing sequence in parts
- Hearing Japanese speakers also performed better than hearing English speakers

“Is a deficit in recall of English linguistic material more a function of **the idiosyncrasies of written English** rather than a **deficit in recall of written material?**”

(Flaherty, “Deaf Signers” 40)

How do language models help us understand cognition?

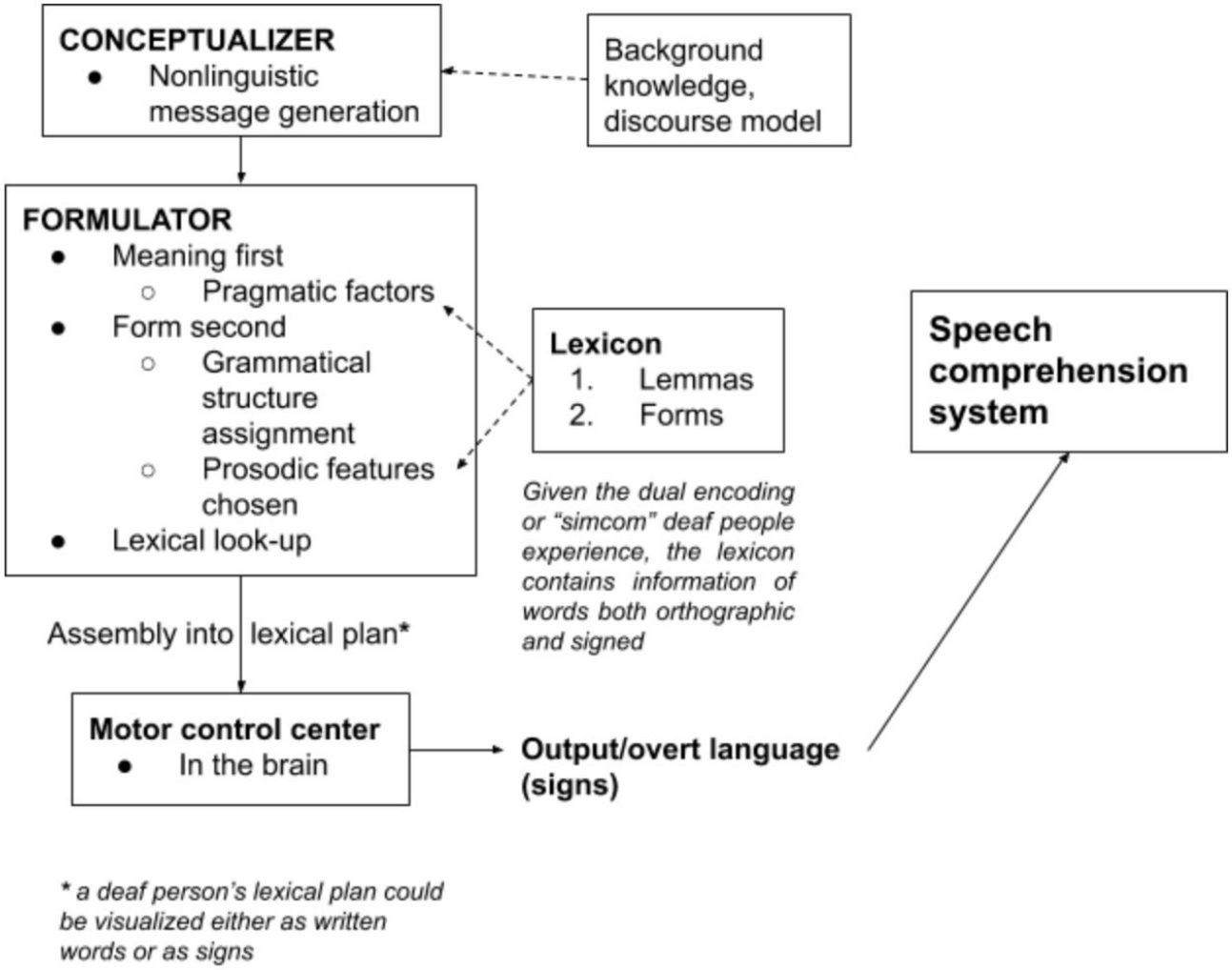
- allow for a detailed understanding of how the brain retrieves information
- able to isolate the role of memory within language production
- can narrow down variables of language-specific stimulus and when and where in cognition they come into play



An example of the Bock and Levelt model.

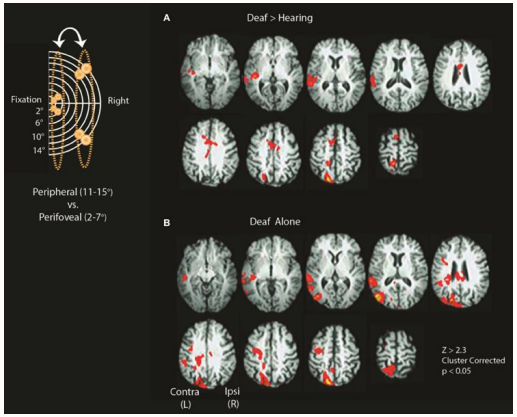
A new model

- Based on
  - Levelt's (1989) general structure
  - Grosjean's (2008) phases
  - Fromkin (1971), Garrett (1975), Butterworth (1979) Deaf models
  - de Bot's (2004) bilingual model



Conclusion

- Necessity for Deaf instructors to teach Deaf children
  - Utilizing a Deaf lens rather than trying to conform to a hearing one
  - Equipped with an innate understanding of how their brains work
- Language production models and other linguistic models can only go so far in studying memory
  - brain scans and neurological tests allow for a view of the brain itself, not just how linguistic functions present verbally or nonverbally.



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