The Relationship Between Non-Verbal Inhibition and Lexical Retrieval

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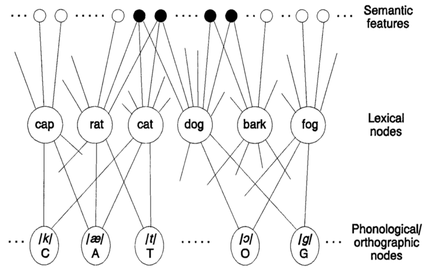
Background

Process of Lexical Retrieval:



(O'seaghdha, 1997)

Inhibition: suppression of competing, non-target information (Higby et al., 2019)

Lexical Retrieval: process of selecting a word from one's mental lexicon (Bialystok, 2008)

Gaps in Literature

Consistency of Tasks:
- Some studies use verbal inhibition tasks while others use non-verbal inhibition tasks

Confounds:
- Populations have confounding variables that could contribute to the findings
  - Sickle Cell Disease = impairment in frontal lobe functioning

Differing Populations:
- Limited information on healthy controls!

Objectives

Research Question: Is non-verbal inhibition correlated with lexical retrieval speed of both nouns and verbs in healthy individuals?

Hypothesis: Non-verbal inhibition will impact performance on lexical retrieval tasks for both nouns and verbs.

Literature Review

Inhibition **plays** a role in lexical retrieval:

Study	Population	Tasks	Conclusion
Goranova et al., 2021	Individuals with Dyslexia	Inhibition: Hayling Test Lexical Retrieval: Blocked-Cyclic Picture Naming Task	Semantic competition leads to difficulty inhibiting which results in poor lexical retrieval
Bialystok et al., 2008	Bilingual Individuals	Inhibition: Simon Arrows Task Lexical Retrieval: Boston Naming Task	Bilinguals have stronger inhibition skills and accurate lexical retrieval
Yu et al., 2013	People with Aphasia	Cognition: LOTCA Language: WAB	Cognition and lexical retrieval skills are highly correlated

Inhibition **does not** play a role in lexical retrieval:

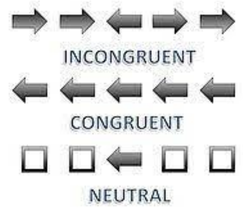
Study	Population	Tasks	Conclusion
Higby et al., 2019	Older Adults (ages 55-84)	Inhibition: Stroop Lexical Retrieval: Boston Naming Task and Action Naming Task	No relationship between inhibition and response time/accuracy for lexical retrieval
Arfé et al., 2018	Children with HbSS Sickle Cell Disease (ages 6-12)	Inhibition: Flanker Task Lexical Retrieval: Boston Naming Task	No relationship between inhibition and response time/accuracy for lexical retrieval

Summary

Inhibition and lexical retrieval have been shown to be closely related as demonstrated by studies analyzing lexical retrieval when there is competition and lexical retrieval in bilinguals. In other studies, no relationship has been found which means the existing research is contradictory. To better understand the relationship between inhibition and lexical retrieval, it is important to look at inhibition tasks when they are non-verbal and when the population is healthy individuals.

Methodology

Test of Inhibition:
Flanker Task



Inhibition: The difference in both accuracy and response time on congruent and incongruent trials

Accuracy and response time for nouns
BNT= 60 items

Accuracy and response time for verbs
VNT= 24 items

Participants:	Tasks:	Analysis:
N=60 HC N=30 PWA Matched for age, education, and SES	Flanker Task BNT VNT Randomized Blocks	Paired T-test Within Subjects Design Comparing performance on tasks for both accuracy and response time.

Next Steps

- ❑ Submit an IRB
- ❑ Recruit Participants – Healthy Controls and Disordered Populations
- ❑ Pilot the Study Online – Gorilla Software
- ❑ Provide the Opportunity for the Study to be Completed in Person

Clinical Implication

Lexical retrieval is a complex process that includes semantics and phonology, but it also involves executive functions like inhibition.

Understanding the relationship between non-verbal inhibition and lexical retrieval will help with tailoring the treatment of those that struggle with lexical retrieval.

If the hypothesis is...

CORRECT, then refining non-verbal inhibition skills can improve lexical retrieval performance in terms of accuracy and response time.

INCORRECT, then working on non-verbal inhibition skills during treatment will not result in an improvement in lexical retrieval performance.

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