Investigating Individual Differences in Visual Word Recognition Using a Lexical Decision Task and the North American Adult Reading Test

Olivia Longpre, İpek Çukurova, Amy vanWell, Jessica Silverman & Dr. James Tanaka
University of Victoria, Canada

INTRODUCTION

- The current study explores the correlation of individual performances between a **lexical decision task (LDT)** and the **North American Adult Reading Test (NAART)** administered using personal laptops.

Part One: LDT
- Participants made word-nonword keyboard responses to various stimuli.
- Distractor types: Pseudoword (pronounceable nonword, FOETH) or Nonword (non-pronounceable nonword, AFRRN).

LDT STIMULI EXAMPLES			
	WORD TYPE		
	REAL	**PSEUDO**	**NONWORD**
HIGH	FAITH	FOETH	AFRRN
	WATER	WOTAR	KPTBS
	CLOUD	CLUID	RJNWJ
	MONTH	MUNTH	CSZIW
	TYPE	TYPA	GDWN
LOW	RAISE	ROESA	MTAJT
	ENVY	ANVY	CBHS
	ANTIC	ONTEC	QSDIZ
	EAGLE	AOGLA	OGXIL
	SKULL	SKOLL	HQDDY

Figure 1. Example stimuli list.

Part Two: NAART
- Participants made verbal pronunciations to irregular single-word stimuli using an online audio-recording tool.

NAART STIMULI EXAMPLES	
INDEX NO.	**TEST WORD**
1	DEBT
7	LINGERIE
13	BOUQUET
19	PSALM
25	SIEVE
31	CELLIST
37	AEON
43	TOPIARY
49	SIDEREAL
55	ENNUI
61	SYNECDOCHE

Figure 2. Example stimuli list.

METHOD

Part One: LDT

- Participants (N=48) completed 10 blocks of 15 trials.

- The task was to make word-nonword responses using the keys [H] and [K] to 4-5 letter, single word stimuli using their dominant index finger.
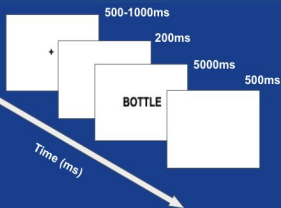
- Real words varied between high frequency (50-1000) and low frequency (1-5).

Figure 3. Keyboard response for LDT task.

500-1000ms
200ms
5000ms
500ms
BOTTLE
Time (ms)

Figure 4. Trial progression for part 1: LDT.

[insert NAART list item here]

▶ 0:00 🔊
Retry   NEXT

Figure 5. Audio response page during practice trials for part 2: NAART.

Part Two: NAART

- Participants made audio recordings pronouncing 61 irregular, single word stimuli.

- Recordings began when the stimuli was presented on the screen and ended when the participant pressed [ENTER].
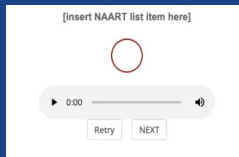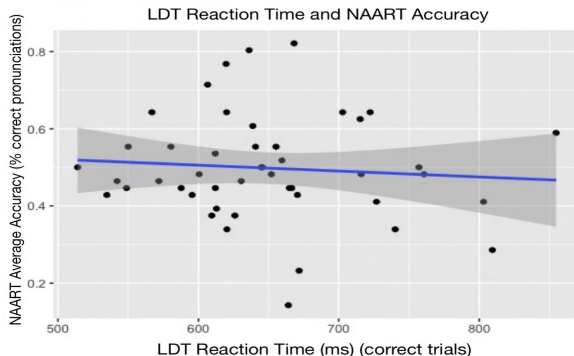

LDT Reaction Time and NAART Accuracy

Figure 6. There was no correlation between participant reaction time on the LDT with NAART accuracy (p > 0.1).

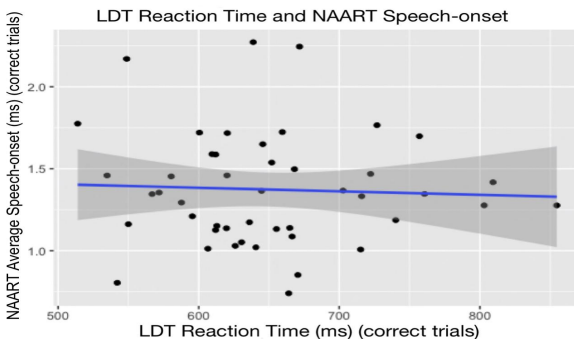LDT Reaction Time and NAART Speech-onset

Figure 7. There was no correlation between participant reaction time on the LDT with NAART speech-onset (p > 0.1).

RESULTS & DISCUSSION

- There was no significant correlation between reaction time on the LDT task with a participant's accuracy on NAART.

- There was no significant correlation between reaction time on the LDT task with a participant's average speech-onset on NAART.

- Participants had significantly faster reaction times for high frequency real word stimuli compared to low frequency real word stimuli.

- Participants who had a slower speech-onset time had significantly higher accuracy on NAART.

- Alone, each the LDT and NAART prove as accurate predictors of visual and verbal reading ability, respectively.

- NAART online should be explored further as a useful tool for more accessible testing by clinical psychologists and other professionals.
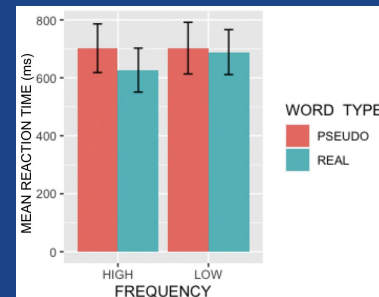

Figure 8. Real word stimuli had the fastest mean reaction times compared to pseudowords and nonwords (p<0.0001). High frequency real word stimuli had the faster mean reaction times than low frequency real words (p<0.0001). Nonwords not shown due to lack of frequency value.

ACKNOWLEDGEMENTS

REFERENCES

Blair, J. R. & Spreen, O. (1989) ; Ratcliff, R., Gomez, P. & McKoon, G. (2004) ; Uttl, B. (2002).

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Part One: LDT
- Participants made word-nonword keyboard responses to various stimuli.
- Distractor types: Pseudoword (pronounceable-nonword, CHUIR) or Nonword (non-pronounceable-nonword, GHXBF).

Part Two: NAART
- Participants made verbal pronunciations to irregular single-word stimuli using an online audio-recording tool.

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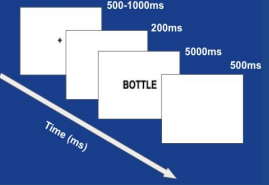- Real word varied between high frequency (50-1000) and low frequency (1-5).

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5000ms
500ms

BOTTLE

Time (ms)

Figure 3. Trial progression for LDT task.

Part Two (NAART):

- Participants made audio recordings pronouncing 61 irregular, single word stimuli.

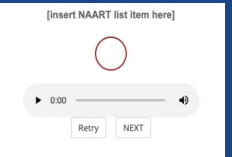- Recordings began when the stimuli was presented on the screen and ended when the participant pressed [ENTER].

[insert NAART list item here]

▶ 0:00   🔊

Retry   NEXT

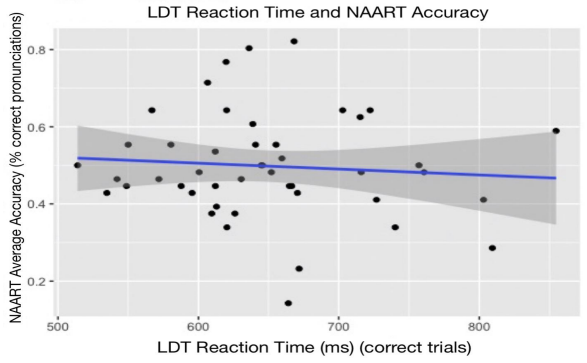*Figure 4.* Audio response page during practice trials for NAART task.

Figure 5. There was no correlation between participant reaction time on the LDT with NAART accuracy (p > 0.1).
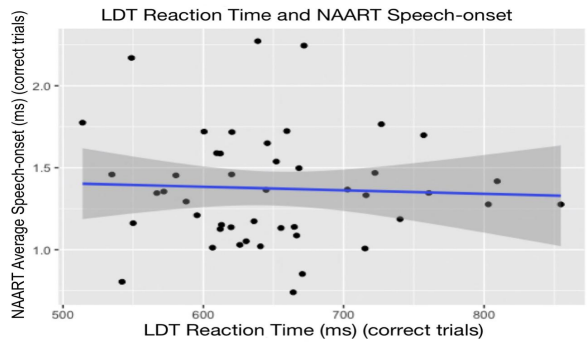

Figure 6. There was no correlation between participant reaction time on the LDT with NAART speech-onset (p > 0.1).

DISCUSSION

- There was no significant correlation between reaction time on the LDT task with a participant's accuracy on NAART.

- There was no significant correlation between reaction time on the LDT task with a participant's average speech-onset on NAART.

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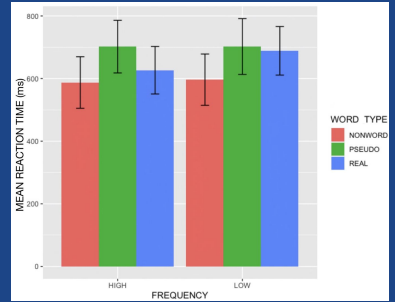

Figure 7. There was a significant interaction between nonword type, frequency, and reaction time on the LDT task (p<0.0001).

ACKNOWLEDGEMENTS

REFERENCES

Blair, J. R .,& Spreen, O., (1989) ; Ratcliff, R., Gomez, P., & McKoon, G. (2004) ; Uttl, B. (2002).