


# The Influence of Working Memory on Reading and Creative Writing Processes in a Second Language

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# 1. Introduction

- Purpose

- the influence of working memory (WM) on **reading and writing**
- measure both the **processing** and **storage functions** of WM

- Rationale

- In one's second language (L2) linguistic processes and problems can be detected very often.
  - predicting that **similar difficulties will appear** in both languages because of a **central processing deficit**.

## 2. Hypothesis

Question 1. What makes one individual a great writer?

- Link into WM's processes
- Figure out how to improve the writing skills of weaker writers

Question 2. Language comprehension proficiency and WM capacity?

- The proficiency would depend on WM
- Significant correlation

## 2. Hypothesis

- Daneman and Carpenter (1980)

“the **efficiency** with which an individual processes language is **determined by their WM capacity**.”

=> **writing** and **reading** undoubtedly **share** several **basic components**.

# 3. Methods

- Participants
  - 47 high school students
  - 37 **native Hebrew** speakers
  - 8 **native Russian** speakers
- Rationale
  - Younger => Better deal with **L2**

# 3. Methods

- Tasks

- 1. **Test of Written Language**

- a comprehensive standardized measure of **writing** ability
    - 10 subtests:

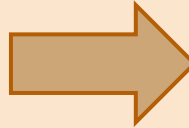
spelling, vocabulary, style, logical sentences, sentence combining, thematic maturity, contextual vocabulary, syntactic maturity, contextual spelling, contextual style

# 3. Methods

## 2 . WM - Reading Comprehension

- determine subjects' **WM** capacity
- procedure

**1) reading two passages**



**2) answering four questions**

### **Pronoun reference**

In the first passage, the distance = 2 sentences

In the second passage, distance = 6 sentences

**Fact (2)**

**Thematic** (theme of the passage)



# Four Results

TABLE V. Correlation between Test of Written Language and WM—reading comprehension test total ( $n = 47$ )

Subtest	Working memory
Total	0.54***
Spelling	0.68***
Vocabulary	0.55***
Style	0.45**
Logical sentences	0.48**
Sentence combining	0.57***
Thematic maturity	0.29*
Contextual vocabulary	0.52***
Syntactic maturity	0.51***
Contextual spelling	0.45**
Contextual style	0.29*

\*  $P < 0.05$

\*\* $P < 0.01$

\*\*\*  $P < 0.001$

## 1. Significant correlation occurred

- between the WM task (the reading comprehension task)
- and the subtests
- and total Test of written Language

# Four Results

TABLE II. Passage 1 WM—reading comprehension (distance two sentences) ( $n = 47$ )

Question type	Sum	Mean	Median	SD	Min	Max
Fact	34	0.72	1	0.45	0	1
Pronoun reference	63	1.34	1.5	0.58	0	2
Thematic	35.5	0.75	1	0.420	0	1
Total	132.5	2.8	3	0.97	0	4

TABLE III. Passage 2 WM—reading comprehension (distance six sentences) ( $n = 49$ )

Question type	Sum	Mean	Median	SD	Min	Max
Fact	21	0.44	0	0.49	0	1
Pronoun reference	61.5	1.30	1	0.63	0	2
Thematic	39	0.82	1	0.43	0	2
Total	119.5	2.54	3	1.0	0	4

## 2. Marginal effect

- The **distance** between a pronoun and its referent
  - ability to **recall** the referent

=> the individual's **working memory** was at work here.

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## 3. Weaker Correlation

- **Thematic Maturity** subtest showed one **exception**
  - measure the instances where the subject used names of characters, objects and so on.

=> Written proficiency and WM are **not necessarily displayed** by use of proper **names** and **objects**.

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# Four Results

Passage 2:

Sitting with Richie, Archie, Walter and the rest of my gang in the Grill yesterday, I began to feel uneasy. Robbie had put a dime in the jukebox. It WAS blaring one of the latest "Rock and Roll" favorites. I was studying, in horror, the reactions of my friends to the music. I was especially perturbed by the expression on my best friend's face. Wayne looked intense and was pounding the table furiously to the beat. Now, I like most things other teenage boys like. I like girls with soft blond hair, girls with dark curly hair, in fact all girls. I like milkshakes, football games and beach parties. I like denim jeans, fancy T-shirts and sneakers. It is not that I dislike rock music but I think it is supposed to be fun and not taken too seriously. And here he was, "all shook up"

## 4. Forgetting words

- Forget words in the **dictation**
- **Substitute** "a" for "the" vice versa

EX) "Wayne" = speaker's best friend

some wrote "my best friend,"

others wrote "his best friend,"

yet others wrote a distortion of the name Wayne.

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## 5. Conclusion

- Assumption
  - confusion of name “Wayne” <= **lack of familiarity.**
  - **a semantic field** was accessed and activated
    - while answering questions regard to the other incorrect answers
  - **phonology in WM** would be also activated.

# 5. Conclusion

- Difficulty
  - **categorically isolating** the WM component of language.
- Future Research
  - While using similar WM tasks
    - names should be **culturally based**
    - significance of the **erroneous responses** should be studied.
  - In order to verify the accuracy of subjects
    - **interviewing** them upon conclusion of WM and writing tasks





Thank You for Your Attention

