Different Types of Bilingualism Affect Working Memory Capacity

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Introduction
1. Working memory in bilinguals:
   • Bialystok (2009): no difference in working memory between monolinguals and bilinguals.
   • Kaushanskaya & Yoo (2011): bilinguals are better.

2. The Problem:
   Prior research treats bilinguals as a homogenous group despite the differences in bilingual status.

3. The Present Study:
   Our hypothesis is that bilingual status will affect the working memory capacity (Daneman & Carpenter, 1980).
   - Control Group: Monolinguals (ML)
   - Experimental Groups:
     • Second Language Learners (L2)
     • Heritage Bilinguals (HBL)

   HBL are bilinguals who have acquired their home/heritage language and societal language, English, simultaneously, but possess a stronger knowledge of the English language.

Method
Participants
Recruited from the CSI SONA subject pool
1. Monolinguals: 22 participants (18F, 5M), average age: 23.3 years old, average GPA: 3.2
2. L2: 6 participants (5F, 1M) – (see Table 2)
3. Heritage Speakers: 15 participants (10F, 5M), average age: 22.8 years old, average GPA: 3.1, Other Language(s) spoken: Arabic, Spanish, Russian, Patois, Italian, Albanian, ASL, Bengali, French

Design and Materials
Task: read blocks of 2-to-5 sentences, memorize and recall the last word of each sentence in correct order
   - Block 2: 2 sentences (see Example of Block 2)
   - Block 5: 5 sentences

Procedure
Conducted online platform FindingFive.com
   • Short questionnaire on demographics and language status
   • The reading and working memory capacity task (Daneman & Carpenter, 1980)
   • Note: The study was self-administered, with no experimenter present so there was no guarantee that participants were not cheating (writing down words during the sentence).

Example: Block 2
Block 2: has 2 sentences (S1 and S2)
Participant reads and then recalls abruptly, all:
   S1: Due to his weak performance, his position as director was terminated abruptly.
   S2: It is possible, of course, that life did not arise on the earth at all.

Results
A significant difference was found in the accuracy of recall in the Working Memory capacity test between L2 and both Heritage Bilinguals and Monolinguals:
   • Monolinguals: 91% accuracy
   • L2: 96.4% accuracy
   • Heritage Speakers: 92.8% accuracy

No significant difference was found between Monolinguals and Heritage Speakers.

Discussion
Our data support the hypothesis that different bilingual status can affect working memory in bilinguals (Kaushanskaya & Yoo, 2011).

Limitations:
• Lack of experimenter observation of participants: It may have allowed participants to use assistance that would not be possible in a laboratory setting.
• Unequal number of participants in each group: Better performance of the L2 group could be due to the small number of participants (n=6).
• L2 need be tested in their native language: To control for the general working memory capacity.

References

Participants Characteristics

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<tr>
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<th>Age of Arrival</th>
<th>GPA</th>
<th>Other Language(s)</th>
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<td>3.4</td>
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Findings:
The differences in bilingual status.

Figure 1
Significant effect of Group: F(2, 42) = 14.079, p < 0.001

Table 1
Results of the statistical analysis: Post-hoc comparisons

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<td>0.015</td>
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Table 2
L2 Participants Characteristics

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