



THE TIMING OF EXERCISE IN SHORT-TERM MEMORY RECALL

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PHYSICAL ACTIVITY DURING COVID-19

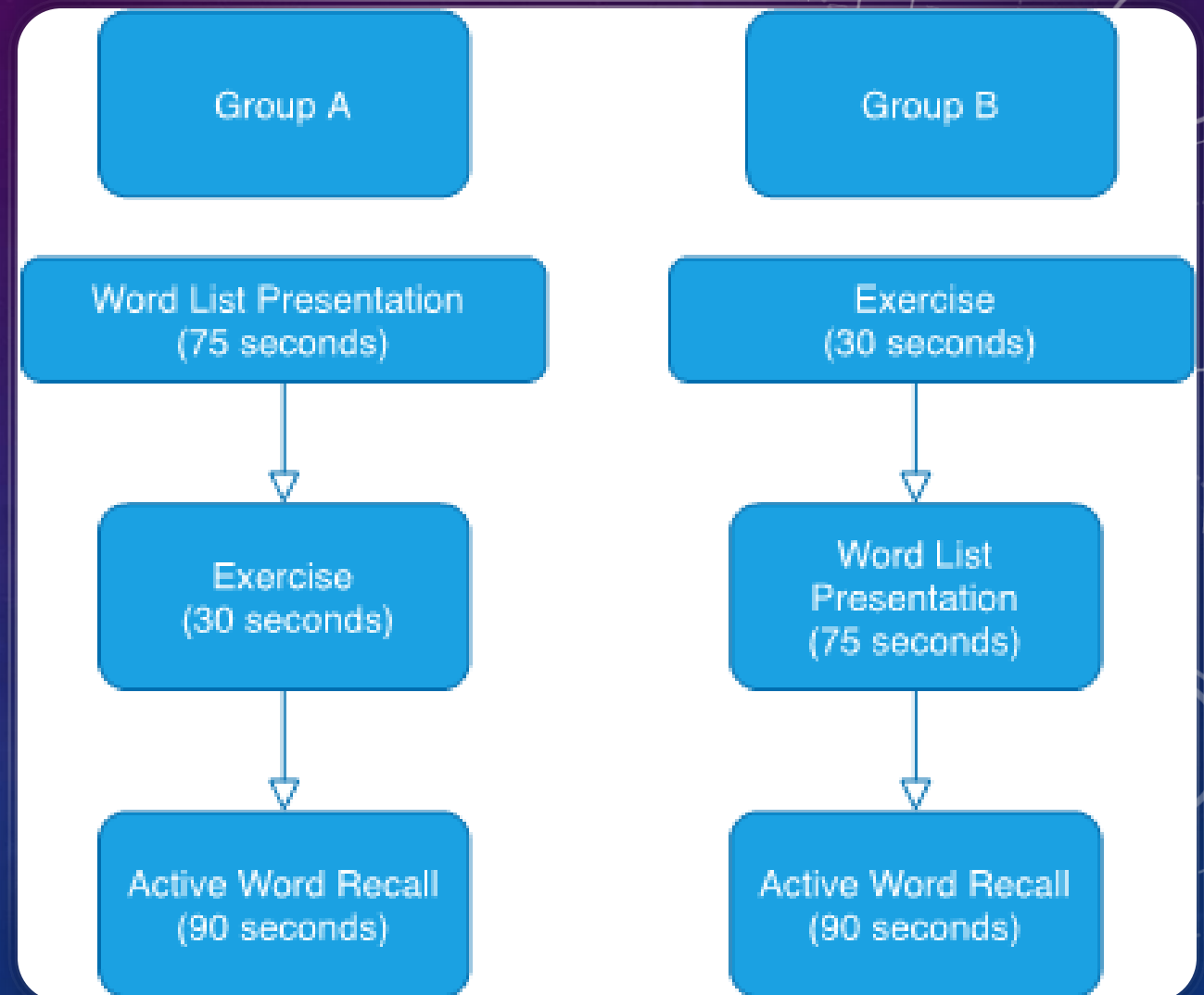
- Sedentary lifestyles have been growing continuously in the age of technology and with the COVID-19 pandemic, this trend may rise as more individuals more people are staying home and therefore more dependence is put on the internet and social media for daily tasks.
- These conditions may promote a sedentary lifestyle that is unproductive for learning and memory in the long-run.
- Given the circumstances, students will likely begin seeking ways to make their learning more efficient. (Dhawan, 2020, pp 4-11, Song, 2004, pp 66-69)
- Can exercise help mitigate these effects?

INTRODUCTION

- Given the benefits of exercise on cognition, we expect that exercising prior to learning will improve recall for words compared to performing the exercise after learning the word list.
- Multiple studies and adaptations have shown the efficacy of the RAVLT & Lezak as one of its commonly accepted versions. As a recognized and respected measure of short-term memory recall, the standardized Lezak version is what we used for this study.
- We hypothesize that exercise before learning has a stronger effect on short-term memory recall than performing exercise immediately after.

METHOD - PROCEDURE

- SurveyMonkey assigned participants randomly into Group A and Group B
- Task: Group A was presented with a word list, asked to perform physical exercise and then tested on the memory task, while Group B performed the exercise, learned the word list and were then tested.
- Spelling mistakes were accepted if the meaning of the word was not altered and it was clear that the error was a typing or spelling mistake, rather than inaccurate recall



METHOD - PARTICIPANTS

- Thirty-four participants amid from Langara's Psychology 2320 Research Methods class of Summer 2020 self-selected to participate in this study.
- While there were no exclusionary criteria, the need to perform jumping jacks may have prompted potential participants to withdraw based on physical ability.

METHOD – MATERIALS

- Demographic questionnaire
- Lezak Auditory Verbal Learning Test
- Online component

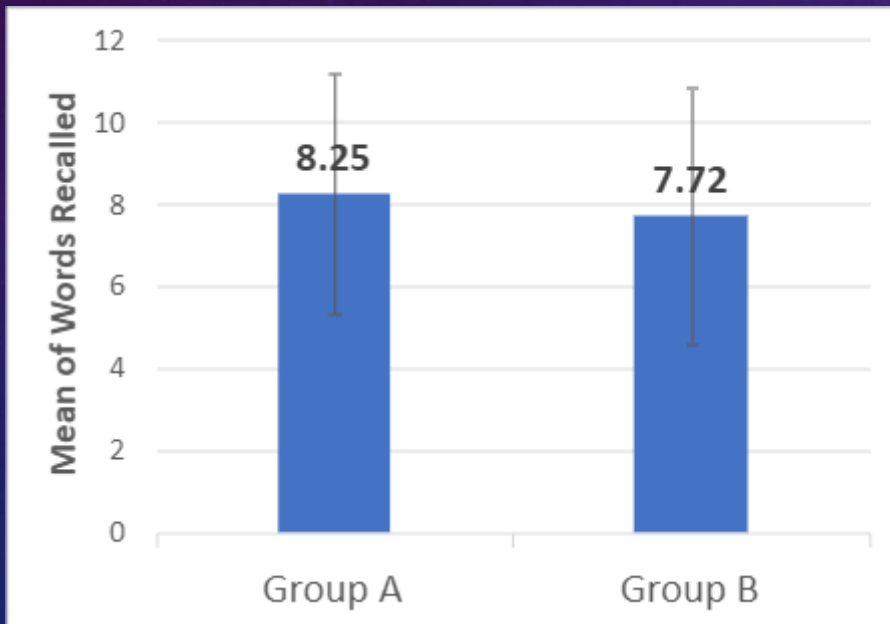


Demographic Questionnaire

1. Age
 - 18-23
 - 24-29
 - 30-35
 - 36-41
 - 42+
 2. Sex
 - Female
 - Male
 - Prefer to Self-describe _____
 - Prefer not to say
 3. How many times do you perform a moderate level of activity per week? (elevated heart rate for 20+ minutes)
 - 1-2
 - 2-3
 - 3-4
 - 4-5
 - 6-7
 - 8+
 4. Do you include exercise or movement in your study process?
 - Yes
 - No
 5. Do you speak English as an additional language?
 - Yes
 - No
- Do you smoke cigarettes regularly (more than one cigarette a day)?
- Yes
 - No

RESULTS

- No statistically significant difference was found in the number of words recalled between the groups.
- group A did recall slightly more words than group B.



- A significant difference was found in the number of words recalled by native English speakers ($M = 6.44$, $SD = 2.263$), and by those who speak English as a second language ($M = 9.33$, $SD = 2.98$).
- Researchers believe that these results were not due to which language was spoken, but rather due to the majority of native English speakers being monolingual, and the others being mostly multilingual.
- Research suggests that the performance of bilinguals, when assessed for executive function, is better than monolinguals (Byalistok, 2011).

DISCUSSION

- The idea that exercising before or after learning will affect one's short-term memory cannot be corroborated by this research.
- Demographic questionnaire provided little additional info.
 - Skewed male numbers across groups could be result of high dropout rate.
 - Only one Participant reported regular smoking.
 - Most participants in the 18-23 age category.
 - No difference in regular exercise categories is backed up by previous research (Bue-Estes, 2008)

DISCUSSION

- Attempts were made to mitigate the difficulty of the necessitated online experimental design; however, the uncontrolled environment may have affected results.
- Inability to monitor heartrates as a potential source of noise.
- Researchers allowed for spelling mistakes allowances should be nullified in future research to avoid any ambiguity.
 - One mistake (chaur instead of chair)

DISCUSSION

- The consensus among the literature is that exercise enhances cognitive function, though there are debates around "testing styles, the function being tested, the timing of the testing, the population and the level of exercise among other things" (Bue-Estes, 2008).
- Most researchers promote further research to identify strongest effects and benefits of exercise on cognition (Bues-Estes, 2008; Labban & Etnier, 2011; Loprinzi, 2018; Yamazaki, 2018).
- Any future research could take the online learning environment into consideration given the current COVID-19 necessitated online learning environment and the general trend toward online learning in general.



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