Changes in memory function in adults following SARS-CoV-2 infection: findings from an online study

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BACKGROUND

10-30% of non-hospitalized cases of SARS-CoV-2 infection are estimated to suffer from some Long Covid symptoms [1,2].

Up to 50% of individuals with other Long Covid symptoms reported also having problems with memory, cognition or concentration [3].

There are mixed results in regards to the protective effect of vaccination against Long Covid symptoms [4–6].

INTRODUCTION

Those who have experienced SARS-CoV-2 were found to have:

- Lower scores on cognitive tasks, particularly those requiring reasoning, planning and problem solving [7].
- Lower scores in reasoning and verbal domains but not in the short-term memory [8].
- Lower performance on memory tasks, verbal item memory task in particular [9]. This is in contrast to usual pattern of memory deterioration found in aging [10].

The current study roughly follows the design of Guo et al., (2022) [9], allowing us to replicate their previous results with two important additions:
(1) Inclusion of information regarding vaccination status.
(2) Inclusion of additional memory tasks, allowing us to disentangle stimulus effects (pictorial vs. verbal) from processing effect (item vs. associative retrieval).

METHODS

- Data collection ongoing since February 2022.
- Data collection on Gorilla.sc consisting of a series of questionnaires and cognitive tasks.
- Participants recruitment mainly through social media, Long Covid support groups and word of mouth and to lesser extent through Prolific.co and Addenbrooke's hospital Long Covid clinic.

GUO ET AL. (2022) [9]

- Significant negative influence of Covid-19 status on memory performance.
- Larger trend for the verbal item recognition test and remained even after controlling for age, sex, country, education level.
- Smaller trend in the same direction was found for the nonverbal associative memory test.
- No significant difference between the groups in Executive Functions performance.

ANALYSIS

Analysis	Predictions	Between subjects	Within subjects	Dependent measures
Analysis 1 and 2: Replication of Guo et al. (2022)	Worse accuracy and slower RTs for C+	C+ vs.. C-		Verbal item memory accuracy / RTs
		C+ vs. C-		Nonverbal associative memory accuracy / RTs
Analysis 3 and 4: Comparison of mnemonic effect	Worse accuracy and slower RTs for C+ group in verbal item than nonverbal associative task	C+ vs. C-	Verbal item vs. nonverbal associative	Accuracy/RTs
Analysis 5: Disentangling memory effects	Worse memory in C+, possible effect of memory type or stimulus type or both	C+ vs. C-	Item vs. associative	Accuracy/RTs
			verbal vs. nonverbal	
Analysis 6: Effect of vaccination status	Better accuracy and RTs for C+ and vaccinated than C+ and non-vaccinated, no difference between C- and vaccinated x C- and nonvaccinated	C+ vs. C-		Accuracy and RTs for all cognitive tasks separately
		Vaccinated vs. Nonvaccinated		

OUTSTANDING QUESTIONS

- Is it necessary to correct for multiple comparisons when the comparisons are preregistered? What would be a good method of correcting?
- How to deal with potential outliers in the data and how to preregister it?
- What other analyses may be interesting?

Demographics
Age
Sex
Education
Country
Ethnicity
Occupation

→

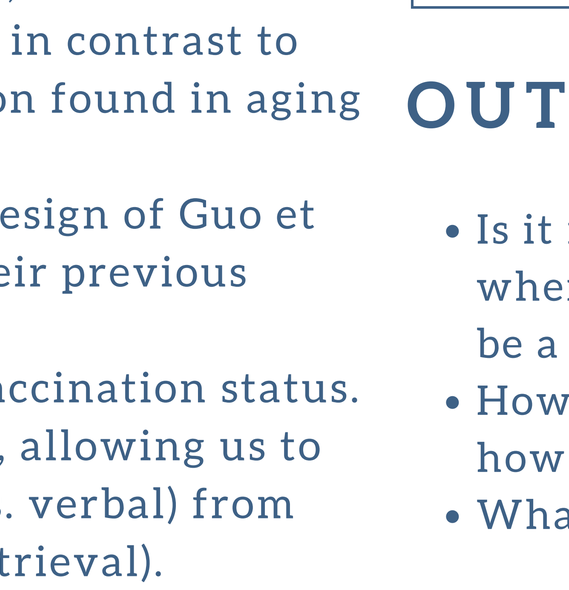
Health
Height
Weight
Medical conditions
Lifestyle

→

Covid
Covid status
Vaccination status
Vaccination details
Covid symptoms
Long Covid symptoms
Timing

→

Cognitive tasks
Nonverbal associative memory task
Verbal associative memory task
Nonverbal item memory task
Verbal item memory task
Digit span memory task
Category Fluency task
Word/Syntax Understanding task
Wisconsin Card Sorting Task



PREREGISTRATION POSTER

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