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The Effects of SARS-CoV-2 infection on Cognitive and Brain Function

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Previous work

- Statistical power in neuroimaging research (undergraduate thesis, University of Cambridge)
- The distribution of published effect sizes in social and developmental psychology (MPhil thesis with Dr Denes Szucs, University of Cambridge)

Research articles

Published correlational effect sizes in social and developmental psychology

Josefína Weinerová ✉, Dénes Szűcs ✉ and John P. A. Ioannidis

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Reproducible ways in my PhD

- Preregistration posters
- PCI Registered Reports
- Preregistrations
- Replication
- Verification of previous findings
- Power calculation (even for secondary data analyses)
- Open code (once we are finished)

Covid-19 and cognition

- 10-30% of non-hospitalized cases of SARS-CoV-2 infection are estimated to suffer from some symptoms that are ongoing for more than 3 months (Bull-Otterson et al., 2022, Ceban et al.,2022)
- Up to 50% of those with ongoing symptoms also report having problems with memory, cognition and concentration (Dennis et al.,2023)
- An association between cognitive problems and brain imaging has been found across different modalities (Zhao et al., 2023).
- Reduced hippocampal neurogenesis found in mouse and hamster models of Covid-19 as well as in human samples (Fernandez-Castaneda et al.,2022; Soung et al., 2022).

Covid and Cognition Study (COVCOG) - Wave 1

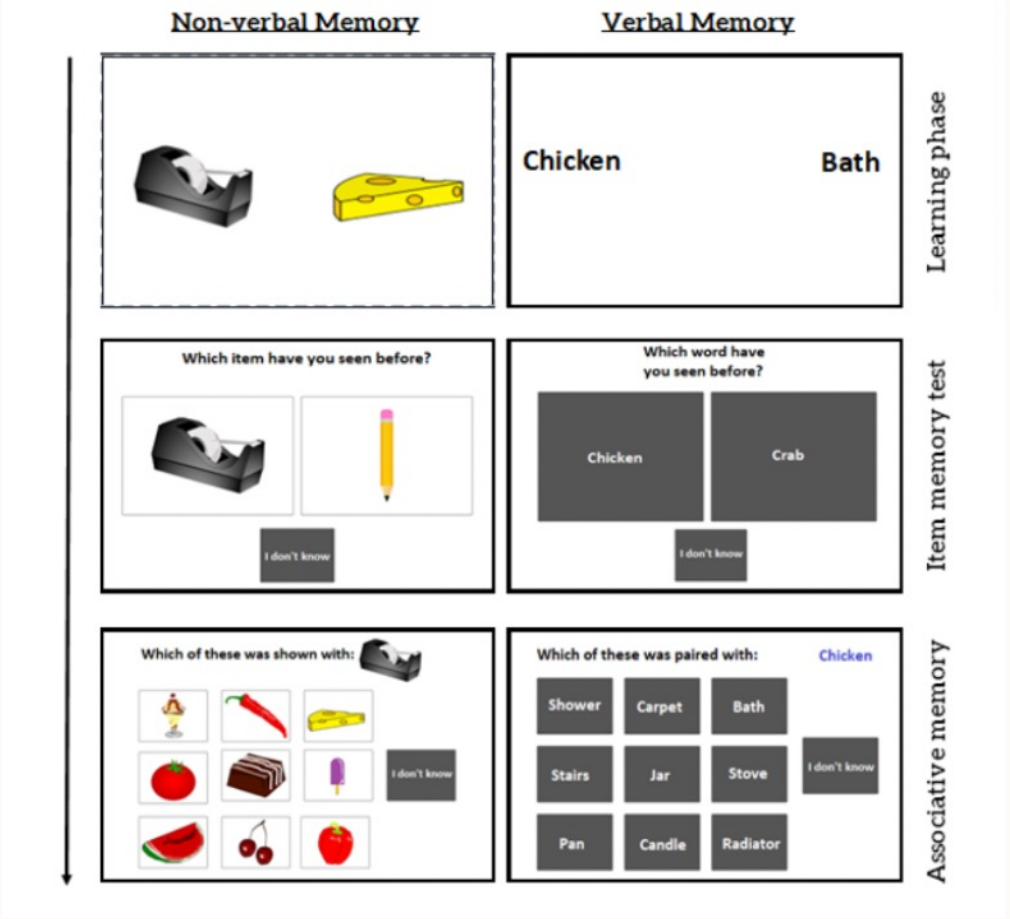
- Data collected by Cambridge Cognition and Motivated Behaviour Lab (CambLab)
- Guo et al. (2022)
- Online data collection
- Found significant negative influence of past Covid-19 infection on long-term memory
- Used 2 tests of long-term memory

COVCOG – Wave 2 data

PROJECT 1

- Secondary data analysis
- PCI Registered Report
- Aims:

1. Replication of analysis of memory tasks in Guo et al. (2022).
2. Extend analysis to newly added long-term memory tasks.
3. Analyse the effect of vaccination.



UK Biobank Covid-19 case control dataset

PROJECT 2

- N=2092 (46-81 years)
- Two testing instances: 2014 -> start of pandemic and 2021
- Additional control group (N=2360, 49-82 years) tested both times pre-pandemic

Cognitive tests:
- TMT A & B
- Associative memory test
- Fluid Intelligence test
- Numeric memory
- Reaction Time test
- Picture Vocabulary test
- Tower test
- Symbol digit test
- Matrix completion

Neuroimaging
- MRI
- rs-fMRI
- DWI

UK Biobank Covid-19 case control dataset

PROJECT 2

- Aims:

1. Replicate findings previously reported for subset of the data (Douaud et al., 2022).
2. Extend analysis to other cognitive tests and imaging modalities.

- Currently working on the preregistration

PROJECT O

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Five creative ways to promote reproducible science

Josefina Weinerova, Rotem Botvinik-Nezer & Roni Tibon

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1. Funded project extensions to postgraduate students against evidence of engagement in reproducible practices.
2. Guaranteed funding for Registered Reports.
3. A reproducible science centralized knowledge base and helpline by discipline.
4. Institutional or departmental contact point for reproducible research practices.
5. Creating and maintaining reproducible science portfolio.

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Other projects

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