

# The impact of COVID-19 infection on Memory and Cognition

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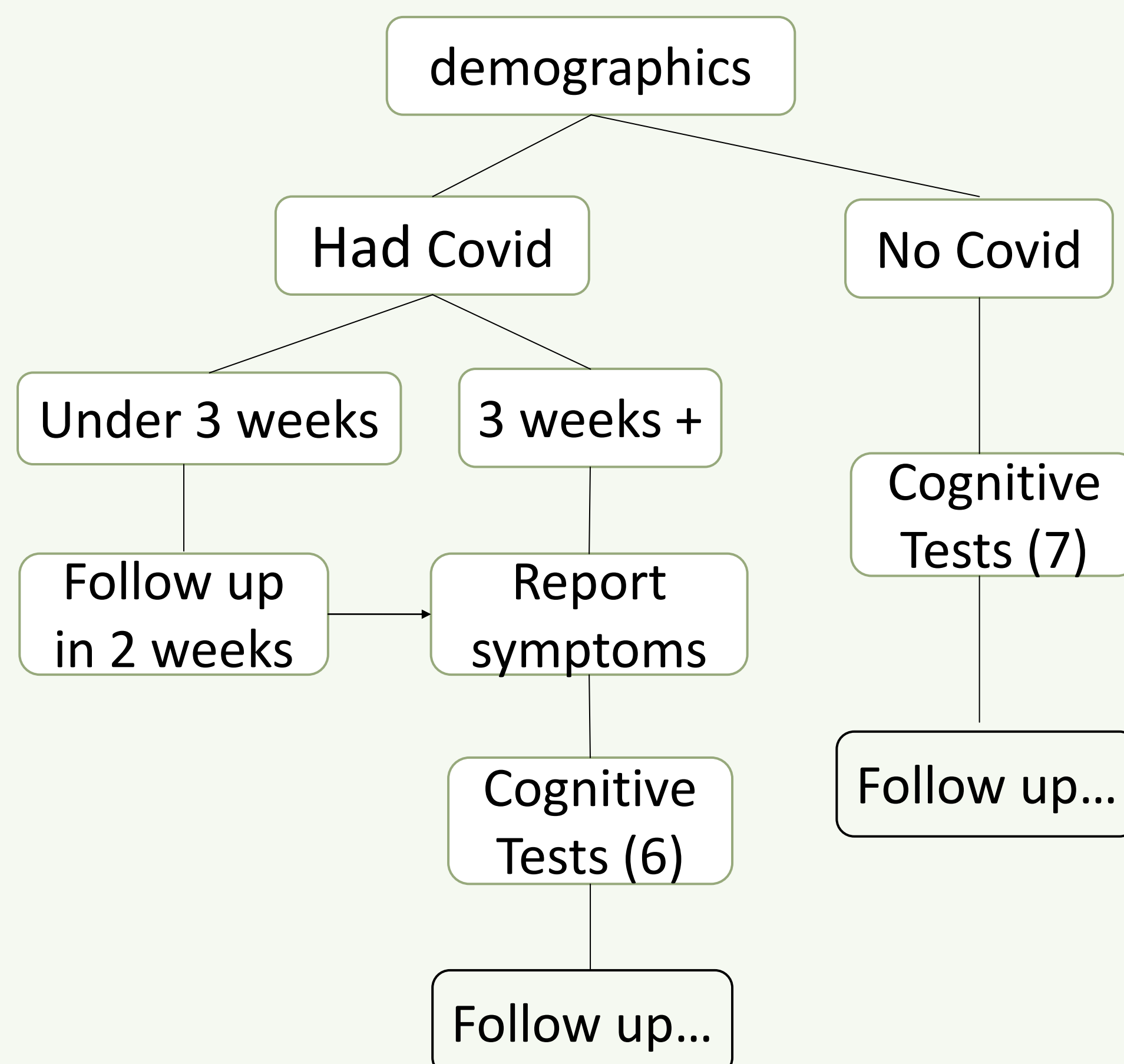
## 1. Introduction

- ❖ Cognitive dysfunction is one of the most commonly and consistently reported symptoms in "Long Covid".<sup>1,2</sup>
- ❖ This deficit scales with symptom severity and is also evident among people who had recovered, including those no longer reporting symptoms.<sup>3</sup>

Aim: to explore the impact of COVID-19 infection on memory and cognition following initial illness, along with the time course of potential deficits and relation to severity of symptoms experienced.

## 2. Method

**Design:** Online survey and testing on Gorilla.sc. **Mixed cross-sectional and longitudinal**, recruiting both those who have and have not been previously infected with COVID-19 but may be at risk of future infection, comparing between them at baseline, and following up both groups. As the follow-ups are ongoing, this poster only presents the first wave data.



**Participants:** No-covid (NC, N=184), Covid suspected or confirmed (C, N=150).

### Cognitive Tests:

1. Relational Reasoning Task (NC only)
2. Wisconsin Card Sorting Test
3. Word list Recognition Test
4. Category Fluency Task
5. Associative Memory Test
6. 2D Mental Rotation Test
7. Real Effort Number Counting Test

## 3. Results

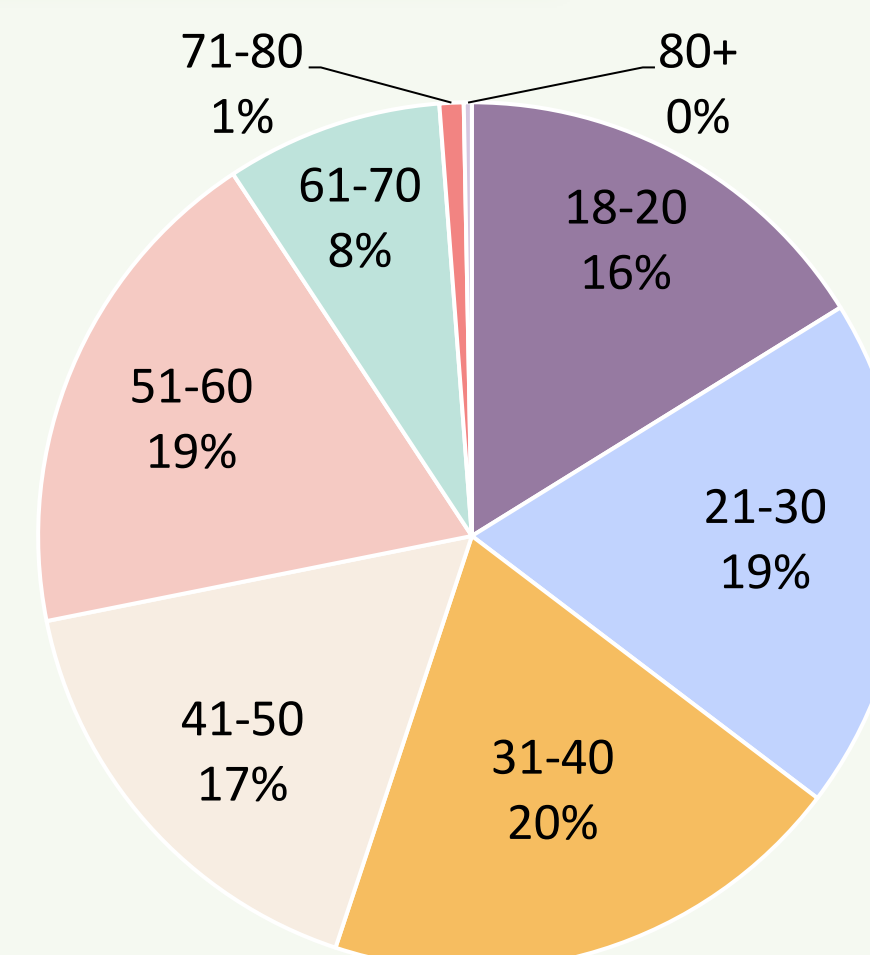


Figure 1. Age distribution

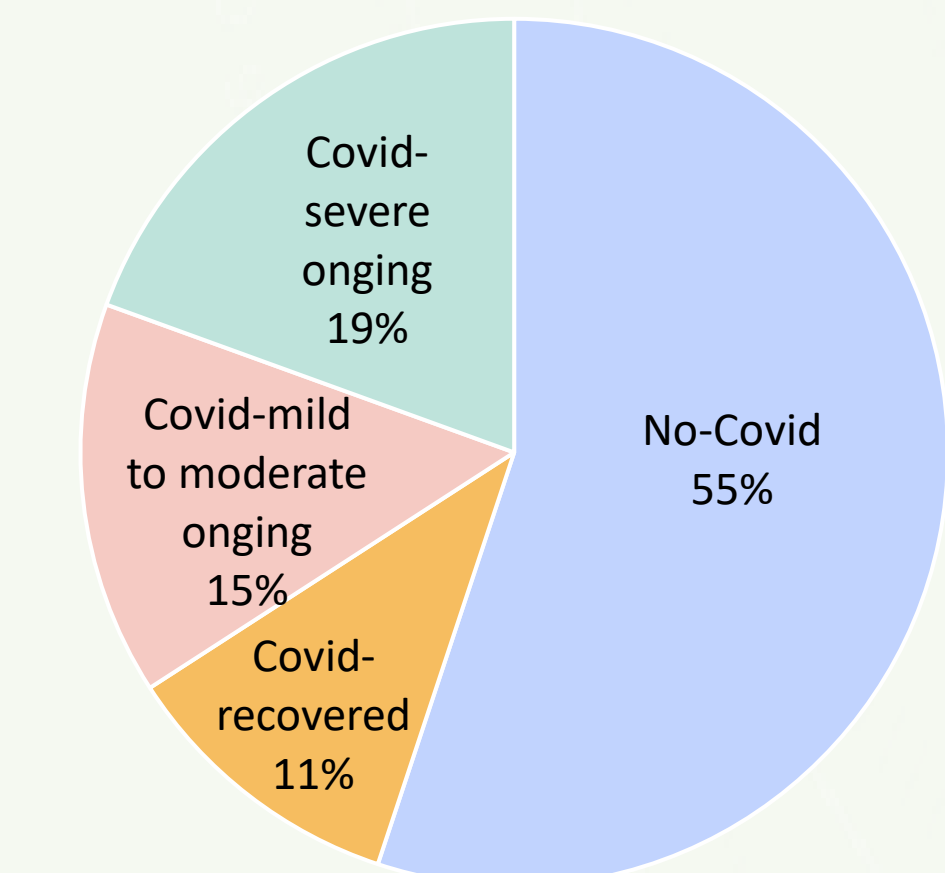


Figure 2. Symptom longevity

Below are the results specifically focusing on memory related tasks.

### I. Cognitive performance by Covid-19 symptom longevity

- Significant differences were found in Word List Recognition ( $F_{RT}(3,311)=8.691$ ,  $p<.001$ ;  $F_{\%correct}(3,311)=3.800$ ,  $p=.011$ ) and Category Fluency tasks (K-W test:  $\chi^2_{repetitions}(3)=13.571$ ,  $p=.004$ ).
- Word List Recognition Task: Pairwise tests revealed that those with severe ongoing symptoms had **lower % correct** than the No-covid group, and had **slower reaction time** than both No-covid group and those that had recovered. Those with mild-moderate ongoing symptoms also had **slower reaction time** than the No-covid group.
- Category Fluency Task: Those with severe ongoing symptoms had **more repeated words** than both the No-covid and Recovered groups.

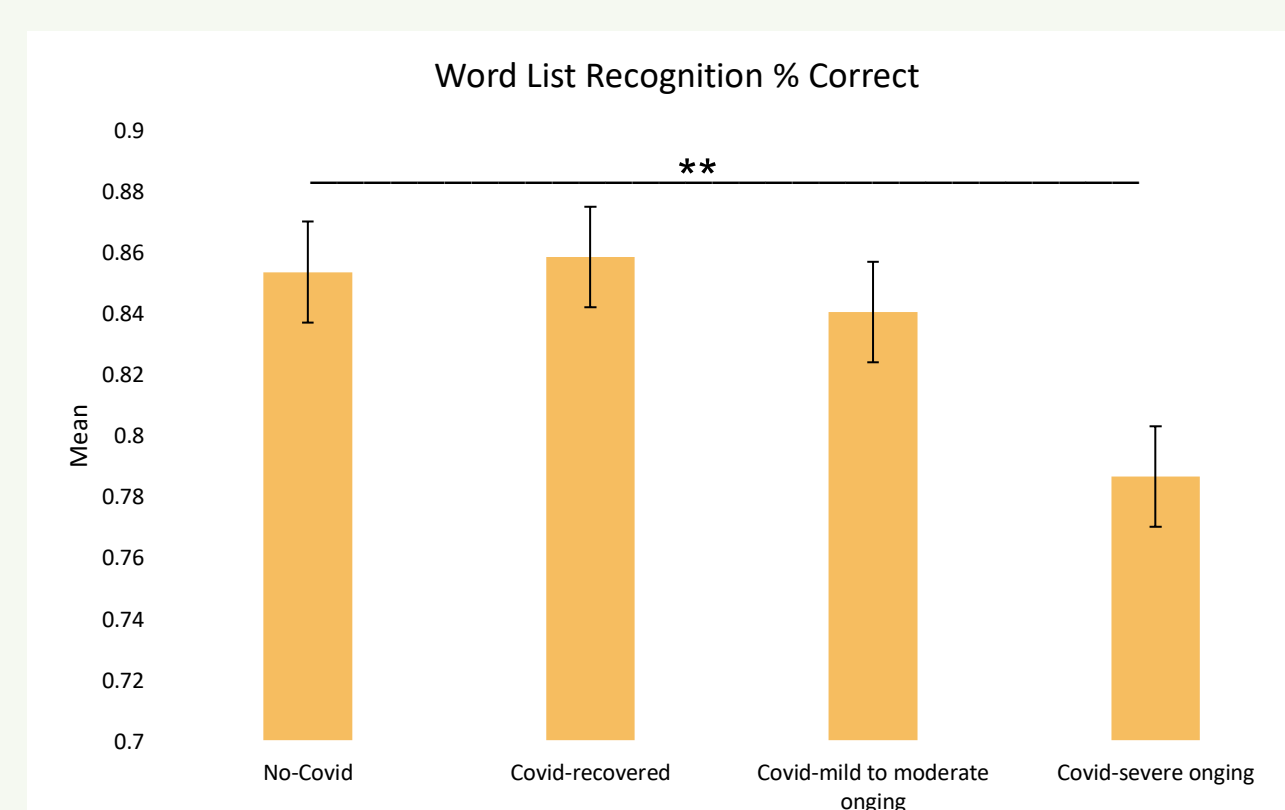


Figure 3. Word List Recognition % correct across groups

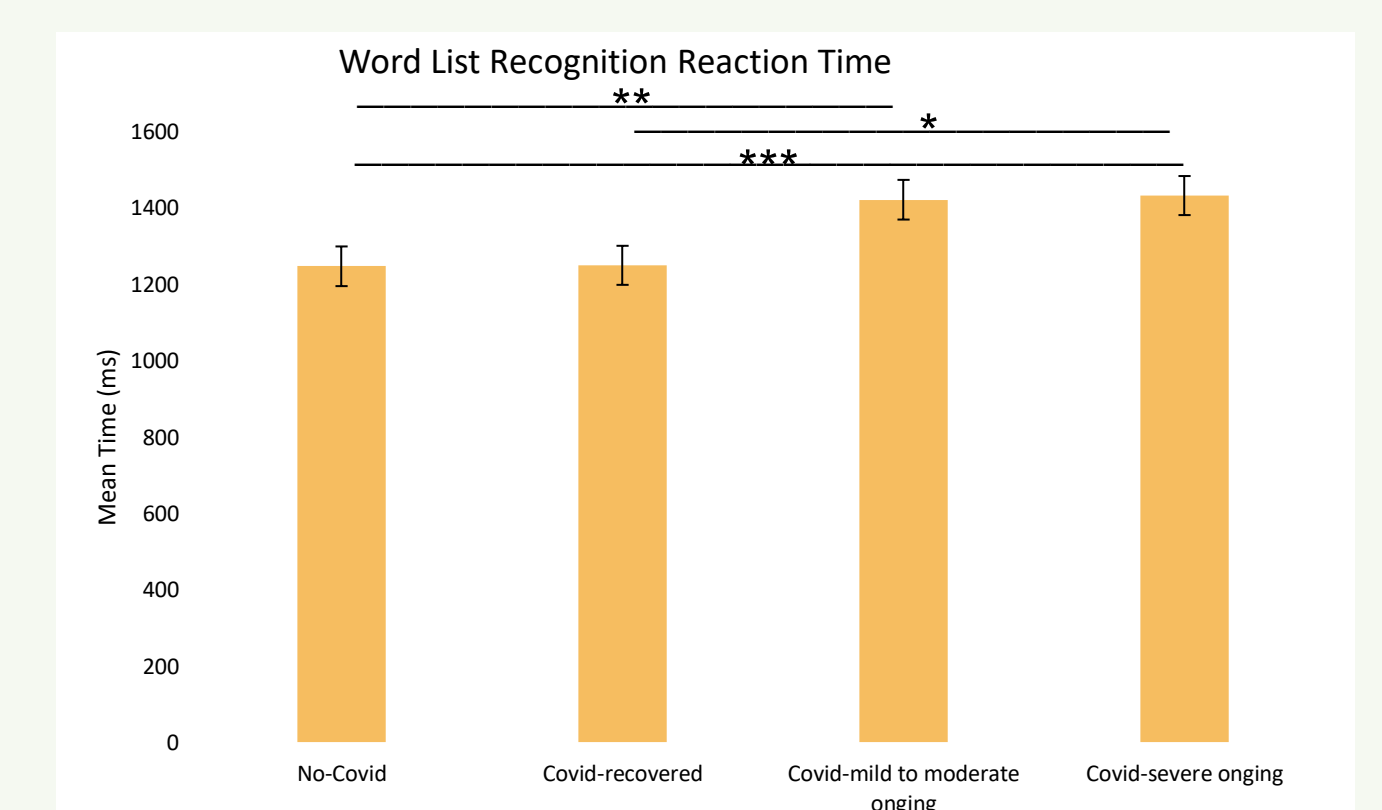


Figure 4. Word List Recognition reaction time across groups

### II. Subjective and objective cognitive deficits

- Regarding current symptoms (within the last 1-2 days), respondents reported experiencing **forgetfulness** (53.3%), **speech difficulty** (8.7%), **"tip of the tongue"** problems finding the right words (47.3%), **semantic disfluency** (saying or typing the wrong words) (33.3%).
- Mann-Whitney Tests revealed that, among people with ongoing symptoms, those reporting these symptoms had **lower % correct** on the Word List Recognition task and **repeated more words** on Category Fluency task (except with symptom of forgetfulness).

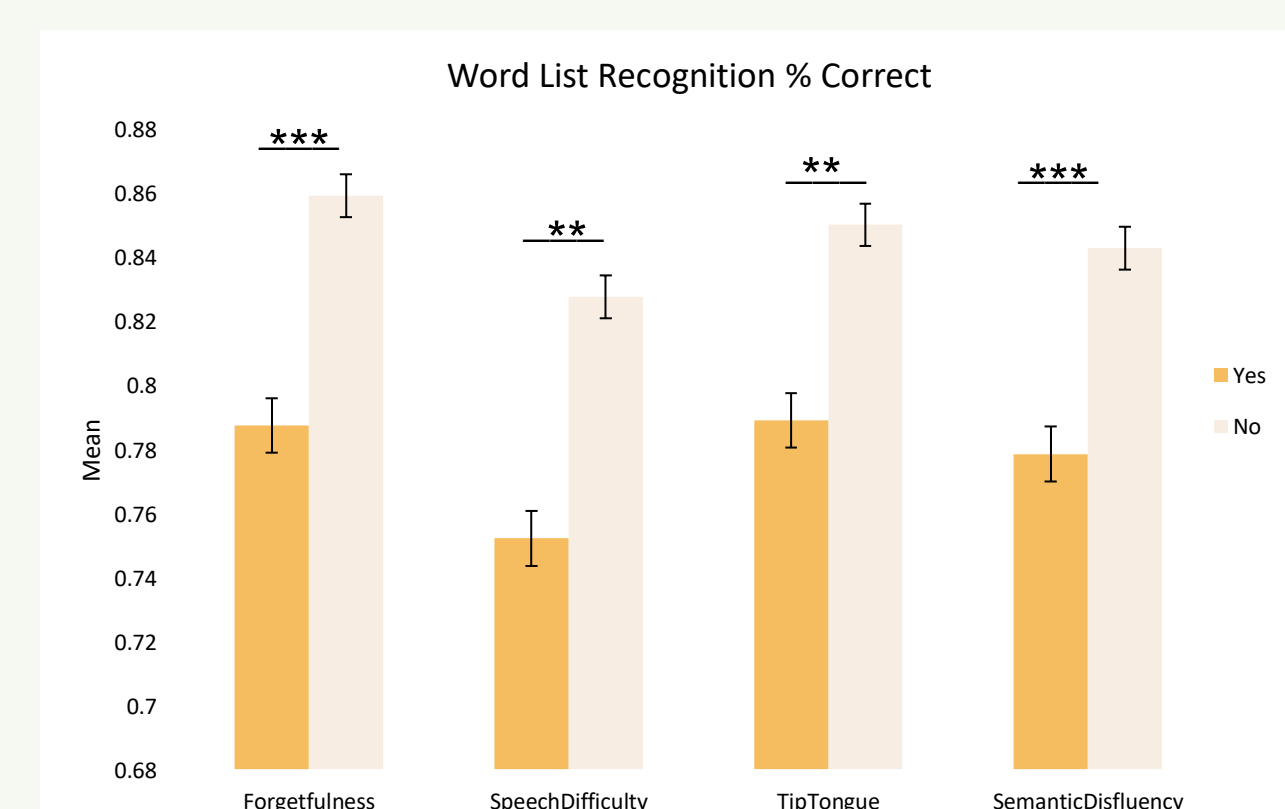


Figure 5. Word List Recognition % correct across symptoms

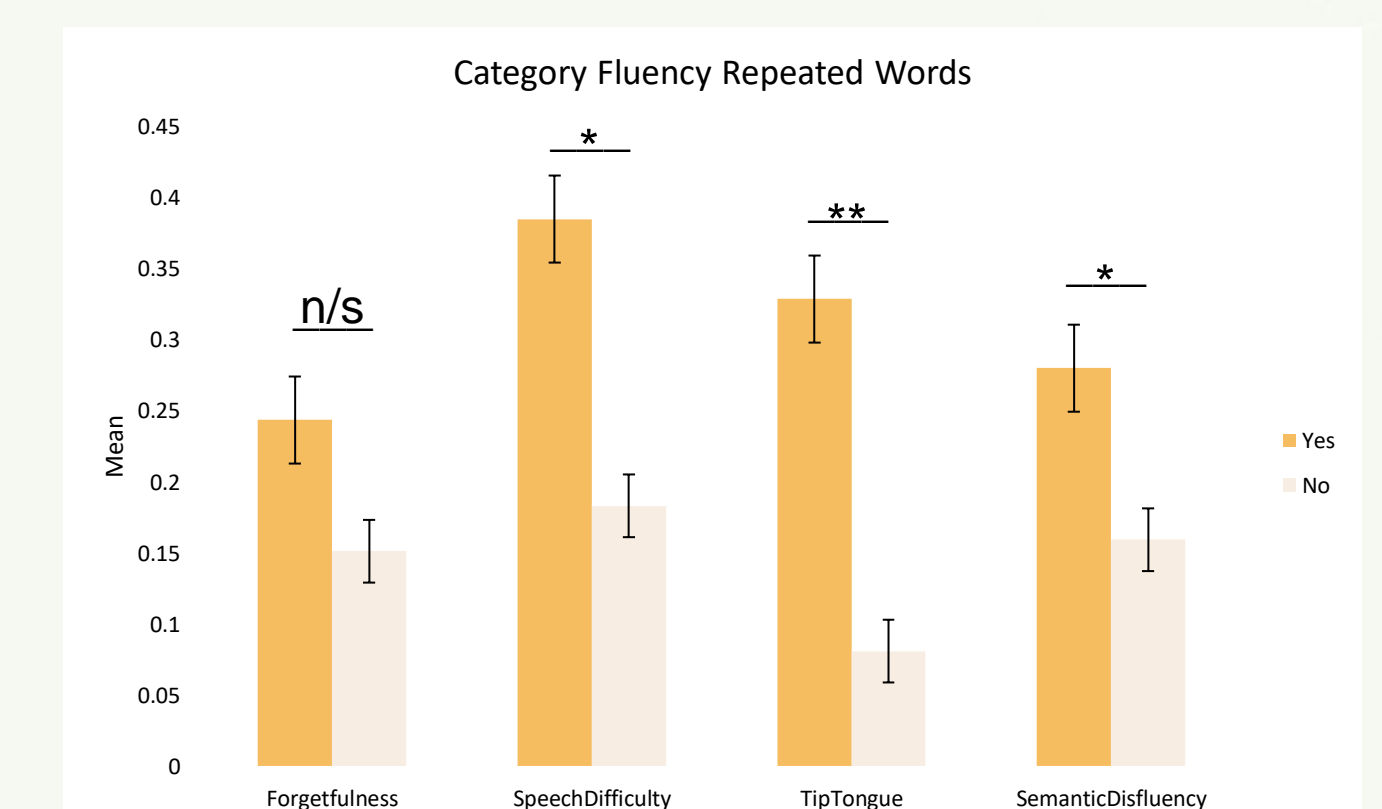


Figure 6. Category Fluency Repeated words across symptoms

## 4. Conclusion

We found increased reaction time and reduction in performance with severity of Long Covid ongoing symptoms. In addition, reported forgetfulness and problems with speech fluency were associated with impairments on the related cognitive tests.

