

Interval Timing As A Potential Early Behavioral Marker Of Mild Cognitive Impairment: A Study Protocol

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Introduction

Time perception, particularly interval timing (IT) - the ability to estimate short durations in the seconds-to-minutes range, is closely linked to core cognitive functions including attention, memory, and executive control. Although alterations in IT accuracy and precision have been consistently reported in patients with Alzheimer's disease, findings in mild cognitive impairment (MCI) populations remains limited and inconclusive. This study aims to compare IT accuracy and precision in older adults with MCI and cognitively normal controls using a visual reproduction task.

Methods

This is a cross-sectional, multicenter study conducted in the Neurology Departments of two tertiary hospitals in Buenos Aires. A total of 110 adults aged ≥ 60 years will be recruited: 55 with MCI (diagnosed using Winblad criteria) and 55 cognitively normal controls (MoCA ≥ 26 , normal neuropsychological profile). Exclusion criteria include major psychiatric or neurological disorders, use of dopaminergic medication, and significant visual impairment. All participants will complete a visual interval reproduction task (figure 1). Participants will also complete a sustained attention task and the Hospital Anxiety and Depression Scale.

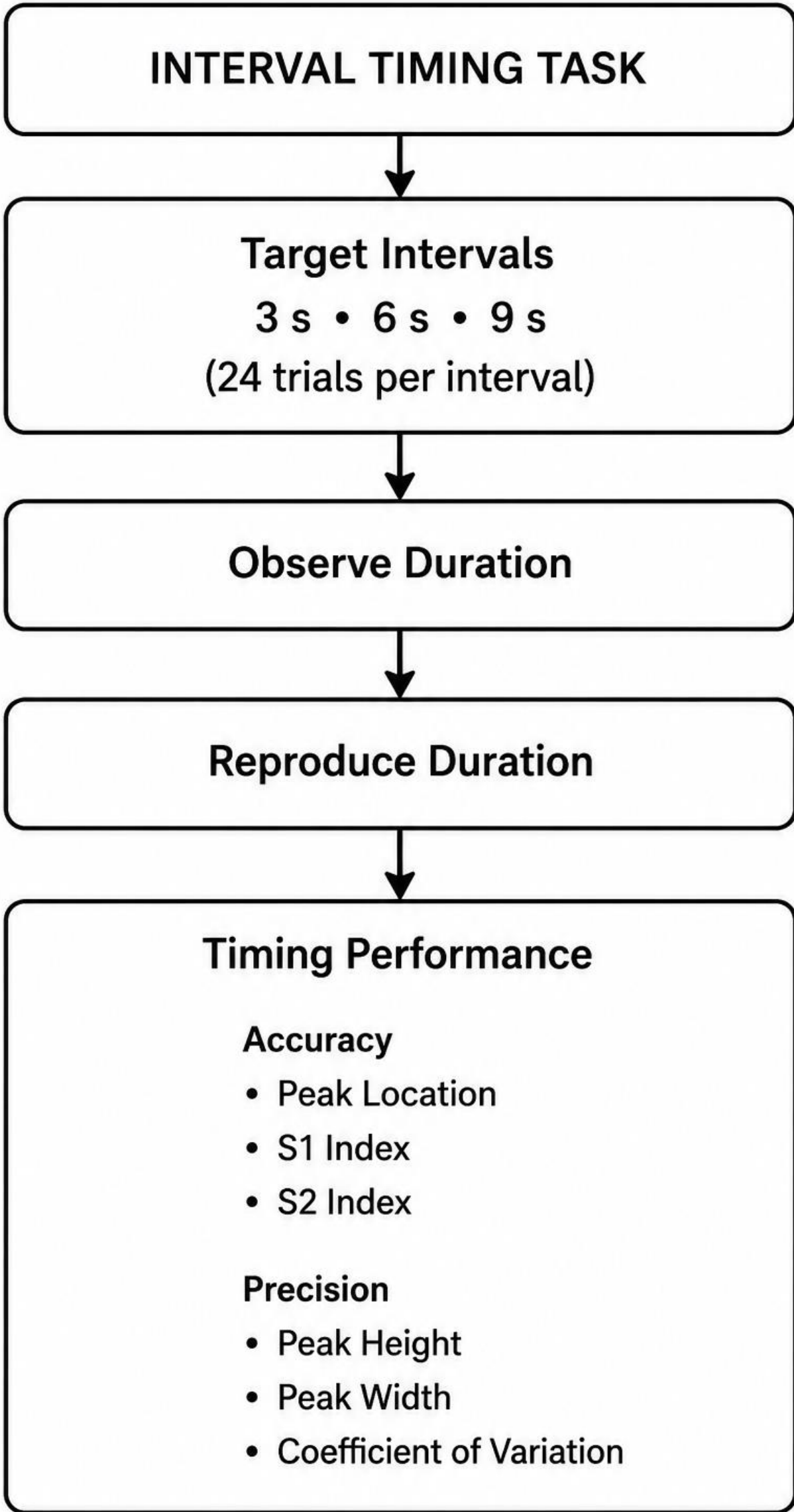


Figure 1: interval timing task

Results

We hypothesize that participants with MCI will exhibit reduced accuracy (e.g., shifted peak location, reduced S1 and S2 indexes) and precision (e.g., increased variability, reduced peak height, and increased peak width) compared with controls. Amnesic MCI participants are expected to present more pronounced deficits.

Conclusions

Altered IT may serve as an early behavioral marker of cognitive impairment. Given the central role of temporal processing in everyday activities requiring precise time estimation, such as decision-making, learning, and memory, its assessment offers a valuable window into cognitive functioning. IT evaluation may provide a sensitive and relevant tool for early detection of cognitive decline and for identifying novel targets for intervention.

References

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