

### INTRODUCTION

- Response inhibition, or action withholding, requires the integration of attention, working memory and motor control processes to withhold a dominant response in favour of a more appropriate /adaptive response (Aron, 2011). Distraction during response inhibition may lead to less appropriate responses being selected.
- The Inhibitory Deficit Hypothesis (Hasher&Zacks, 1988) states that older adults are less able to filter out irrelevant information in the environment. This can lead to distraction during goal-directed behaviours (Rodrigues&Pandeirada, 2015).

#### Aims

- To assess the effects of age and distraction on accuracy and RT during an Interference Go/No-go task

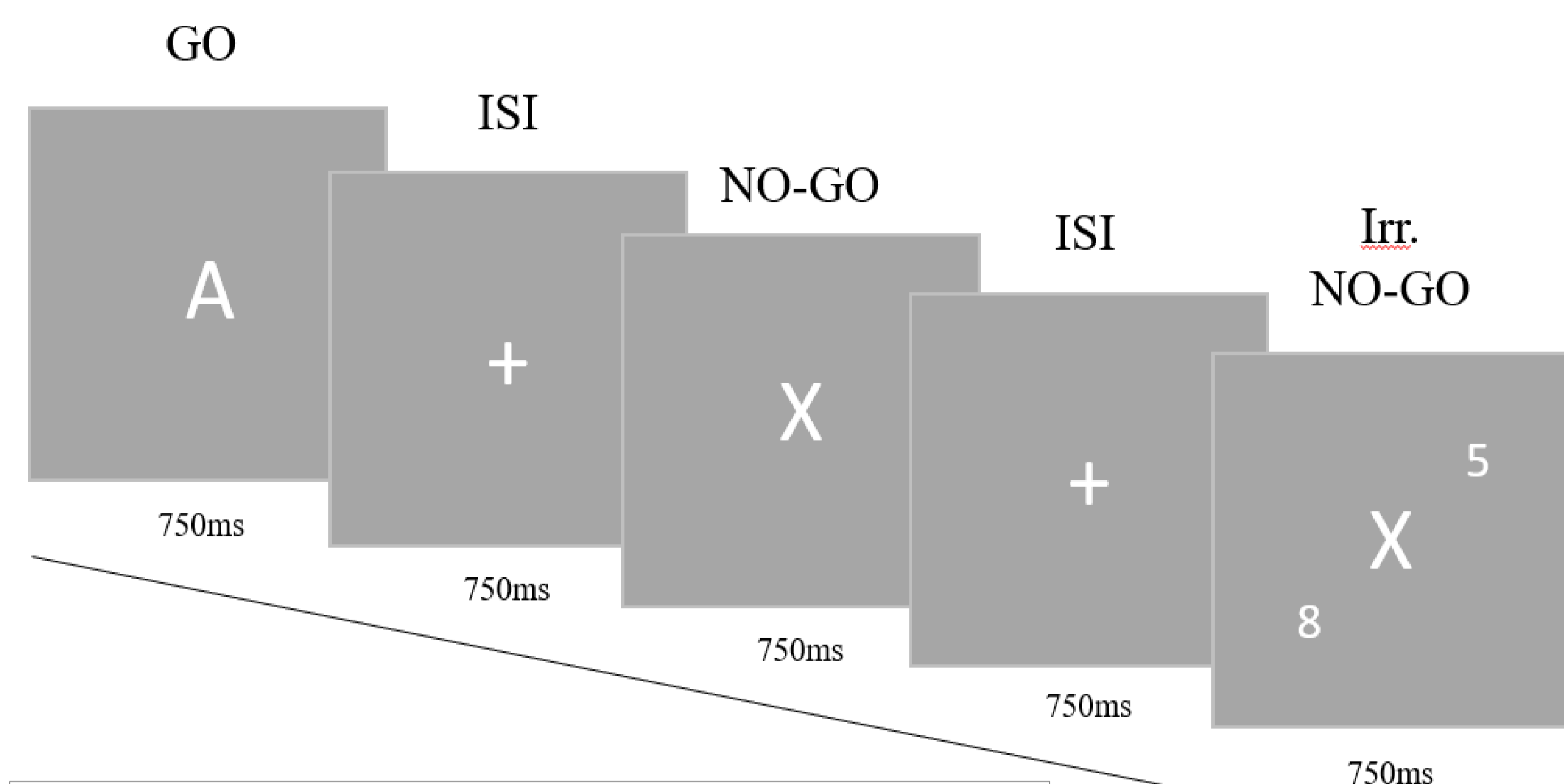
#### Hypotheses

- Older adults will have lower accuracy rates and higher RT than young adults on the Go/Nogo task
- Older adults will have lower accuracy and higher RT when more distractors are presented

### METHODS

**Participants:** One hundred twenty-six older adults (mean age = 66.1 years) and one hundred thirteen younger adults (mean age = 27.7).

**Task:** A Go/No-go task was developed (see Fig. 1). Go trials (75% of trials) were any letter of the alphabet, and Nogo trials 25% of trials) were the letter “X”, with 50% of Nogo trials containing distractors (336 trials total, 84 Nogo trials, 42 distractor trials). Distractors presented varied between 0-3. Stimulus and ISI presentation time was 750ms.



**Figure 1.** Go/Nogo task. ISI= inter stimulus interval. Adapted from Hsieh *et al.* (2016).

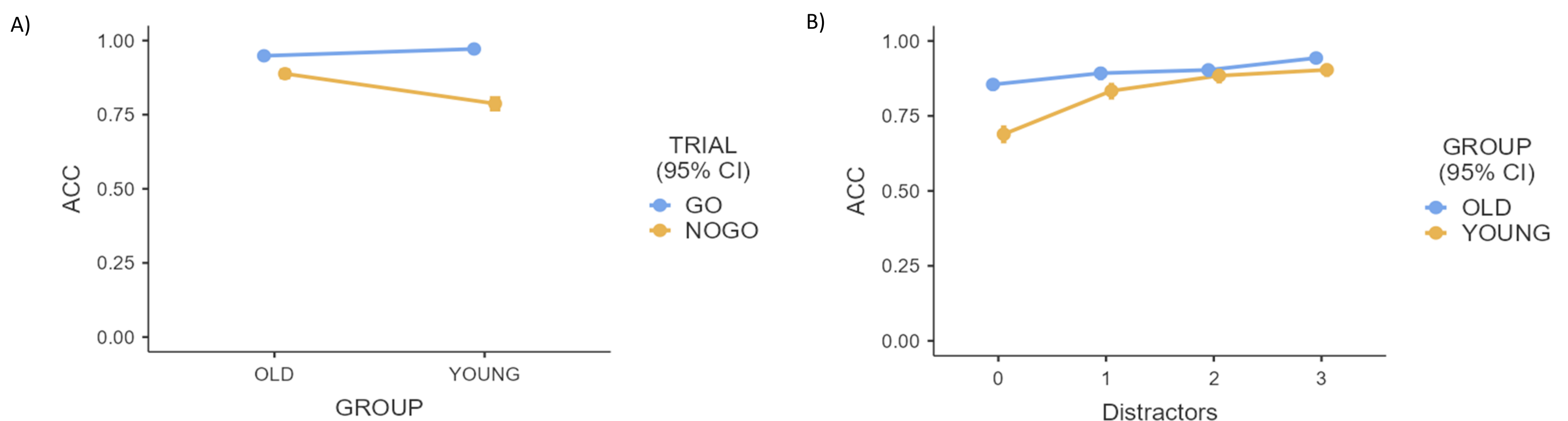
### RESULTS

**Linear Mixed Model 1--** DV: Accuracy, Fixed: Trial (Go/Nogo), Group (Young/Old), Random effect: Participant ID

- Trial (Go/Nogo) \* Group (Young/Old),  $p < .001$

**Linear Mixed Model 2--** DV: Accuracy, Fixed: Distractors (0, 1, 2, 3), Group (Young/Old), Random effect: Participant ID

- Group (Young/Old) \* Distractors (0, 1, 2, 3),  $p < .001$



**Figure 2.** Results of LMM analyses. A) Model 1. Accuracy scores between Old and Young group on Go & Nogo trials. B) Model 2. Accuracy scores between Old and Young group on Distractor Nogo trials (x-axis represents number of distractors presented).

### DISCUSSION

- Older adults perform better than younger adults during Nogo trials on an interference Go/No-go task, suggesting that ageing literature remains conflicted. There have been previous studies that have suggested that older adults maintain or even improve cognitive performance in certain domains, such as emotion regulation, semantic memory, and language comprehension (Campbell, Lustig, Hasher, 2020).
- Hyper-binding theory (Campbell, Hasher & Thomas, 2010) suggests that older adults are less able to filter out irrelevant information and instead encode it and use it to facilitate performance. This has been demonstrated with memory tasks (Hasher&Zacks, 1979).
- It is possible that our paradigm aided the performance of the older group by providing context cues about the trial type. This context may have been used to identify the Nogo stimulus and select the appropriate response.
- Higher RT also suggests a speed-accuracy trade-off. This is potentially corroborated by the significant difference in RT, suggesting longer times spent processing the stimulus and selecting responses.
- Follow-up studies will examine functional brain activity to delineate neural differences associated with Response Inhibition and distraction in ageing.
- This research contributes to the ageing debate and strategies used by older adults to achieve accurate performance. This knowledge could contribute to interventions aimed at addressing cognitive deficits in both healthy and pathological ageing.

#### References

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