

Age Differences in Inhibition of Return and Inhibitory Tagging during Spatial Orienting of Attention

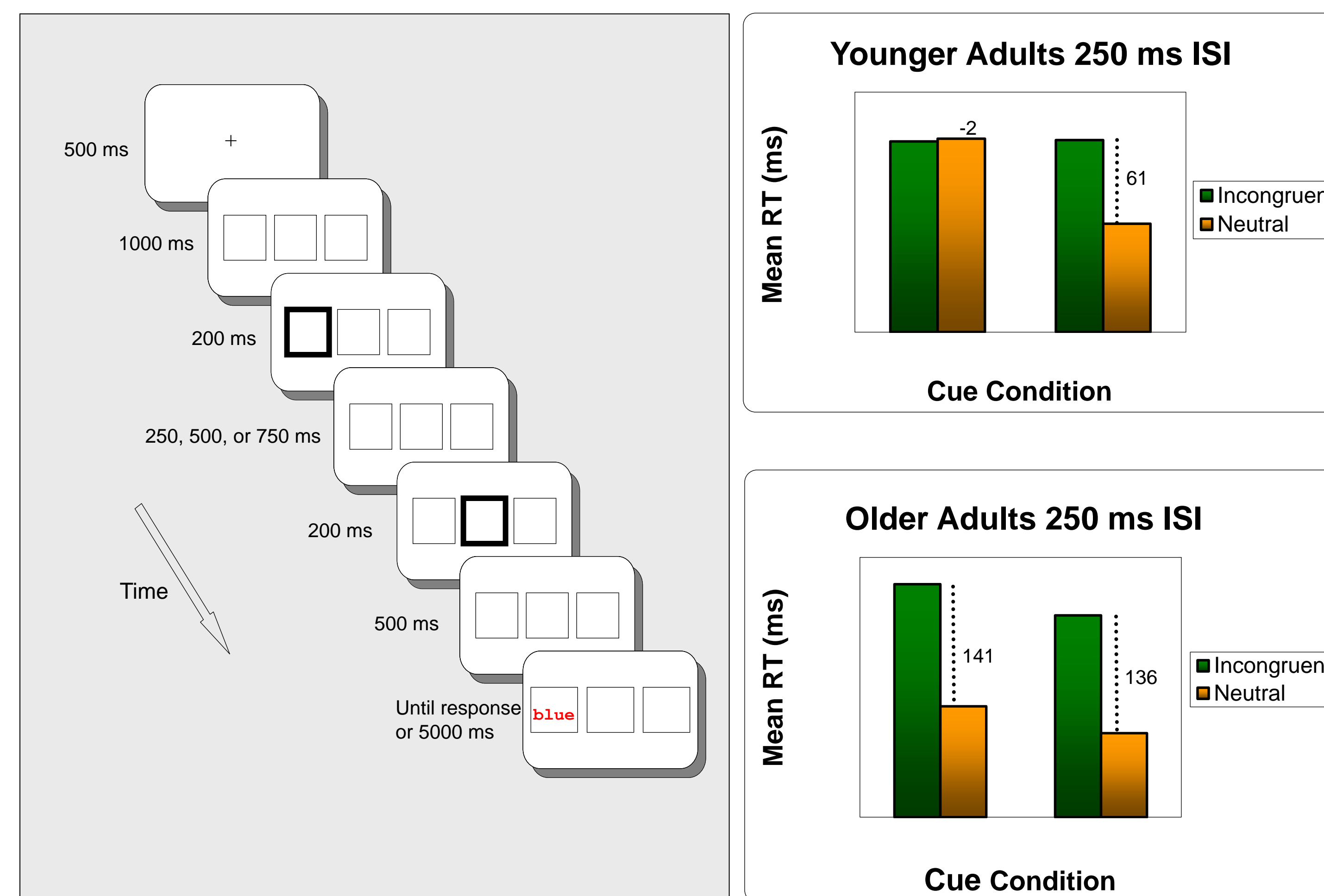
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Introduction

Inhibition of return (IOR) is a phenomenon of attentional orienting; it is indexed by slower reaction times to targets presented at previously attended locations, and it is thought to bias attention towards novel locations. An inhibitory phenomenon that is proposed to accompany IOR is *inhibitory tagging*, an inhibitory process that acts on stimuli presented at previously attended locations (Fuentes, Viva, & Humphreys, 1999). Langley, Vivas, Fuentes, and Bagne (2005) found inhibitory tagging for younger adults but not older adults at short stimulus onset asynchronies (SOAs). However, because older adults produce IOR at longer SOAs (Castel et al., 2003), they may also develop inhibitory tagging at these later SOAs. The purpose of Experiment 1 was to manipulate SOA to assess if older adults develop inhibitory tagging but at a longer time interval. The purpose of Experiment 2 was to determine if inhibitory tagging could be evidenced with a semantic priming paradigm.

Experiment 1



Results

Experiment 1

- There was a significant three-way interaction of group, Stroop condition, and cue location, $F(1, 86) = 5.31, p < .05$.
- Older adults and younger adults both showed significant cue location effects (Cued RT > Uncued RT), reflecting IOR.
- At the shortest ISI (250 ms), younger adults demonstrated reduced Stroop effects (Incongruent RT – Neutral RT) at the cued location relative to the uncued location, consistent with inhibitory tagging.
- At all ISIs, older adults showed similar Stroop effects at the cued and uncued locations. Inhibitory tagging did not develop at longer intervals.

Experiment 2

- There was a significant three-way interaction of group, cue condition, and prime condition, $F(1, 70) = 4.29, p < .05$.
- Both groups showed a semantic priming effect (Unrelated RT – Related RT).
- Younger adults showed reduced priming effects at the cued location compared to the uncued location, consistent with inhibitory tagging.
- Older adults showed similar priming patterns at both the cued and uncued locations.

Method

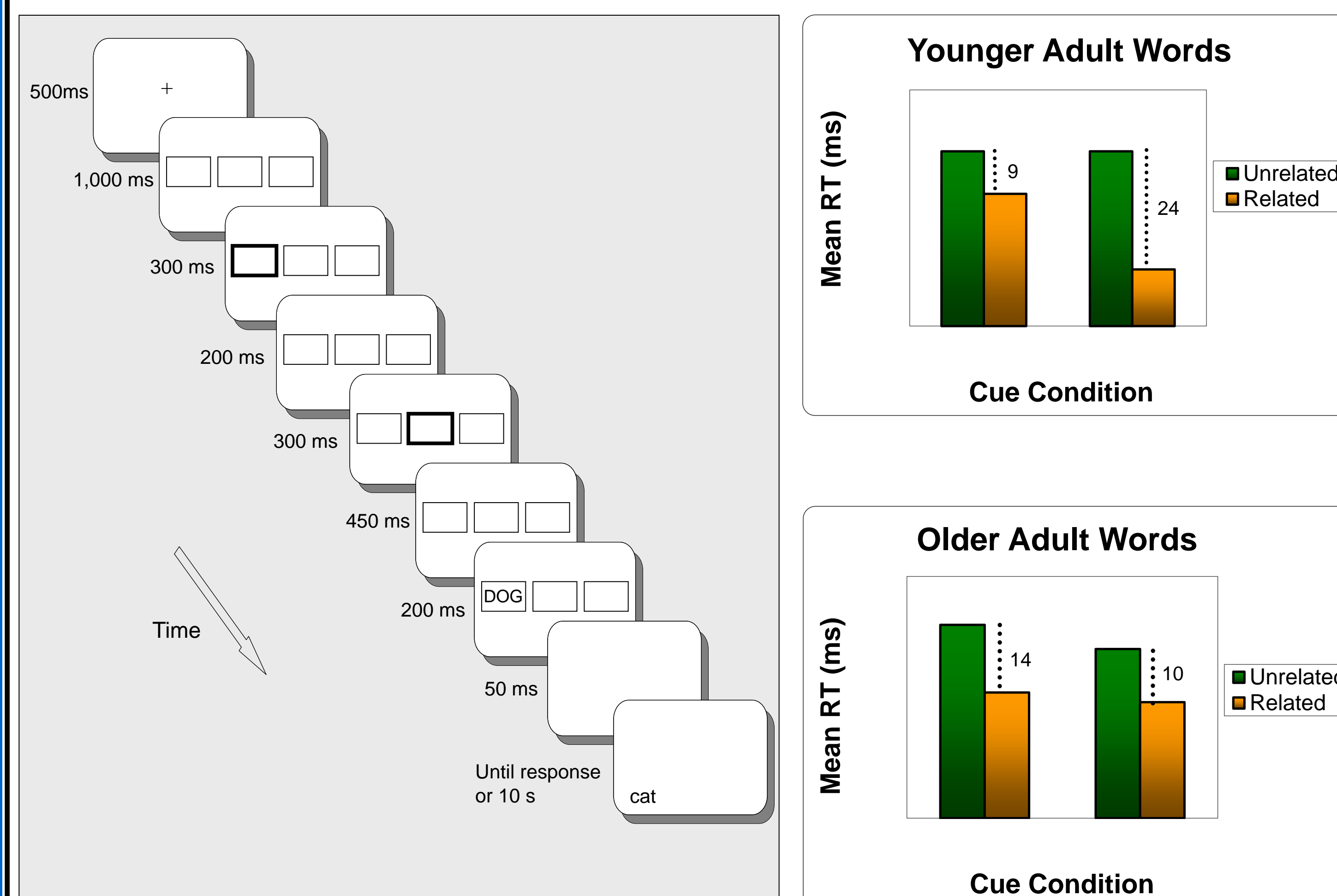
Participants

- Experiment 1: 44 younger adults (18-33 years); 44 older adults (60-78 years)
- Experiment 2: 36 younger adults (18-25 years); 36 older adults (60-76 years)

Tasks

- In both experiments, a peripheral cue directed attention away from fixation, while a central cue returned attention to fixation. The target (Exp 1) or prime word (Exp 2) was presented either in the same location as the cue (*cued condition*) or at the other peripheral location (*uncued condition*). Three cue-target SOAs were used for Experiment 1.
- In Experiment 1, the target stimulus consisted of colored Xs (*neutral condition*) or a color word in an incongruent color (*incongruent condition*). Participants pressed a button on the response box to indicate the ink color of the target (red, green, or blue).
- In Experiment 2, the prime word was followed by a target *word/nonword*, which appeared directly beneath the prime word. The target was *related* or *unrelated* to the prime word. Participants made a lexical decision to the target with a button press.

Experiment 2



Conclusions

- Both younger and older adults showed normal IOR (Experiment 1).
- Younger adults showed inhibitory tagging in terms of reduced Stroop effects (Experiment 1) and reduced priming effects (Experiment 2) at inhibited locations.
- There was no evidence for inhibitory tagging for older adults in either experiment.
- It can be concluded that different inhibitory processes are associated with spatial orienting and that these inhibitory processes are differentially affected by age.

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