

Introduction

There are times when we need to track multiple objects, for example, cars navigating an intersection or family members walking in a crowd.

In the multiple object tracking (MOT) task, participants track a varying number of objects as they move among distractors. The task requires selective attention to maintain focus and working memory to update object files for the moving targets.

Trick, Perl, and Sethi (2005) found that young adults could track 4 targets among 10 objects with over 90% accuracy. In contrast, older adults tracked 2 objects with over 90% accuracy and 4 targets with 70% accuracy.

To further explore age differences in tracking, we used a “Catch the Spies” version of the MOT task in which participants tracked 2-5 targets among 12 objects for 10 seconds.

Due to age-related declines in selective attention and working memory, we predicted that older adults would perform less accurately and track fewer targets than young adults.

Method

Participants

34 young adults ($M=18.8$ yrs; 18-23 yrs; 9 M/25 F)

34 older adults ($M=71.5$ yrs; 60-85 yrs; 12 M/22 F)

Stimuli and Procedure

Participants completed 40 trials (10 each of 2, 3, 4, and 5 targets).

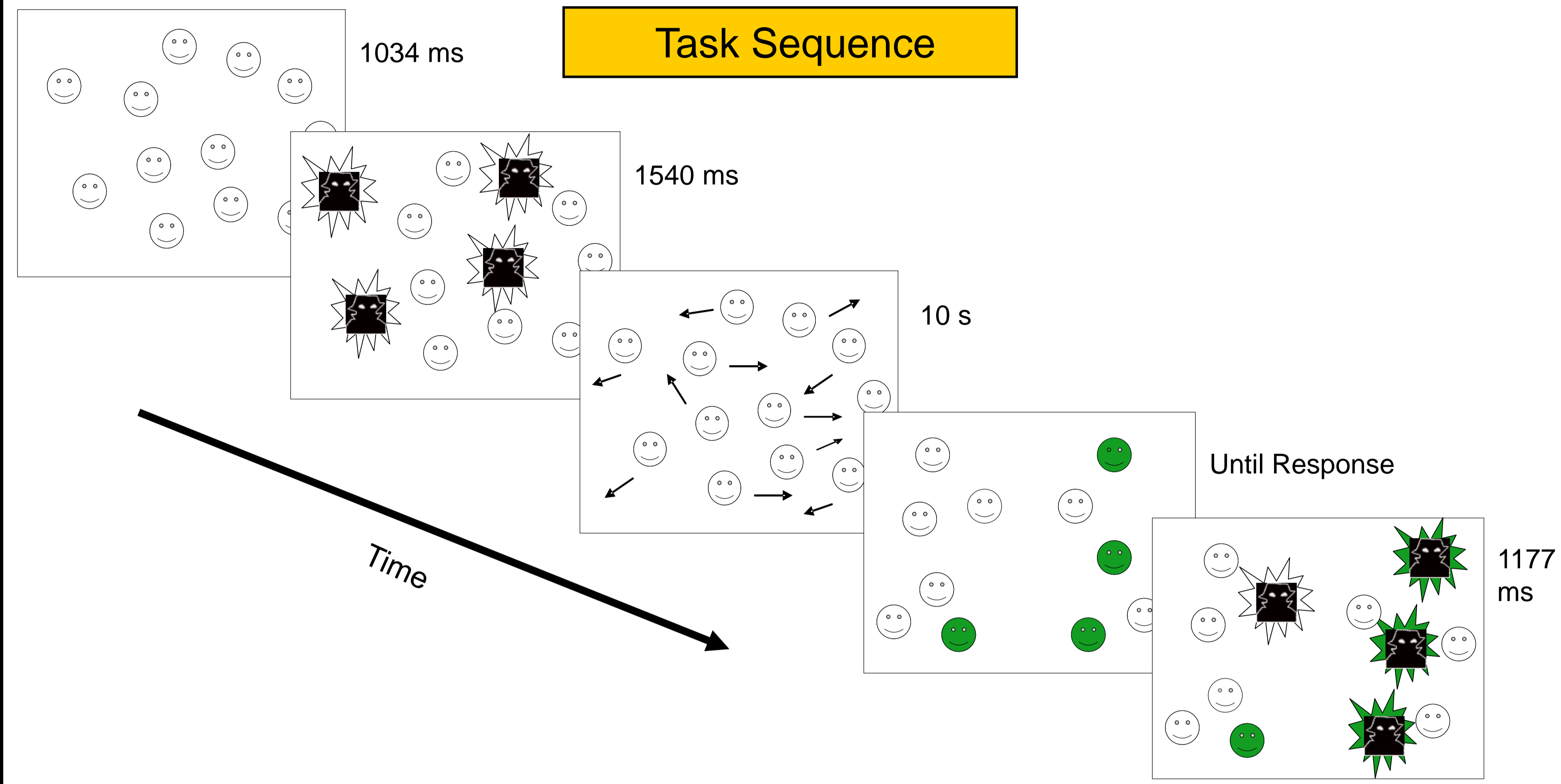
In a display of 12 smiley faces, 2-5 faces briefly changed to “spies” to reveal the objects to be tracked.

All objects returned to smiley faces and independently moved for 10 seconds.

Once the objects stopped moving, participants used the mouse to click on the “spies.”

Feedback was immediately given in the form of the “spies” being shown in alternation with the responses made.

Task Sequence



Results

Young adults were more accurate than older adults, $F(1,66) = 64.5, p < .0001$.

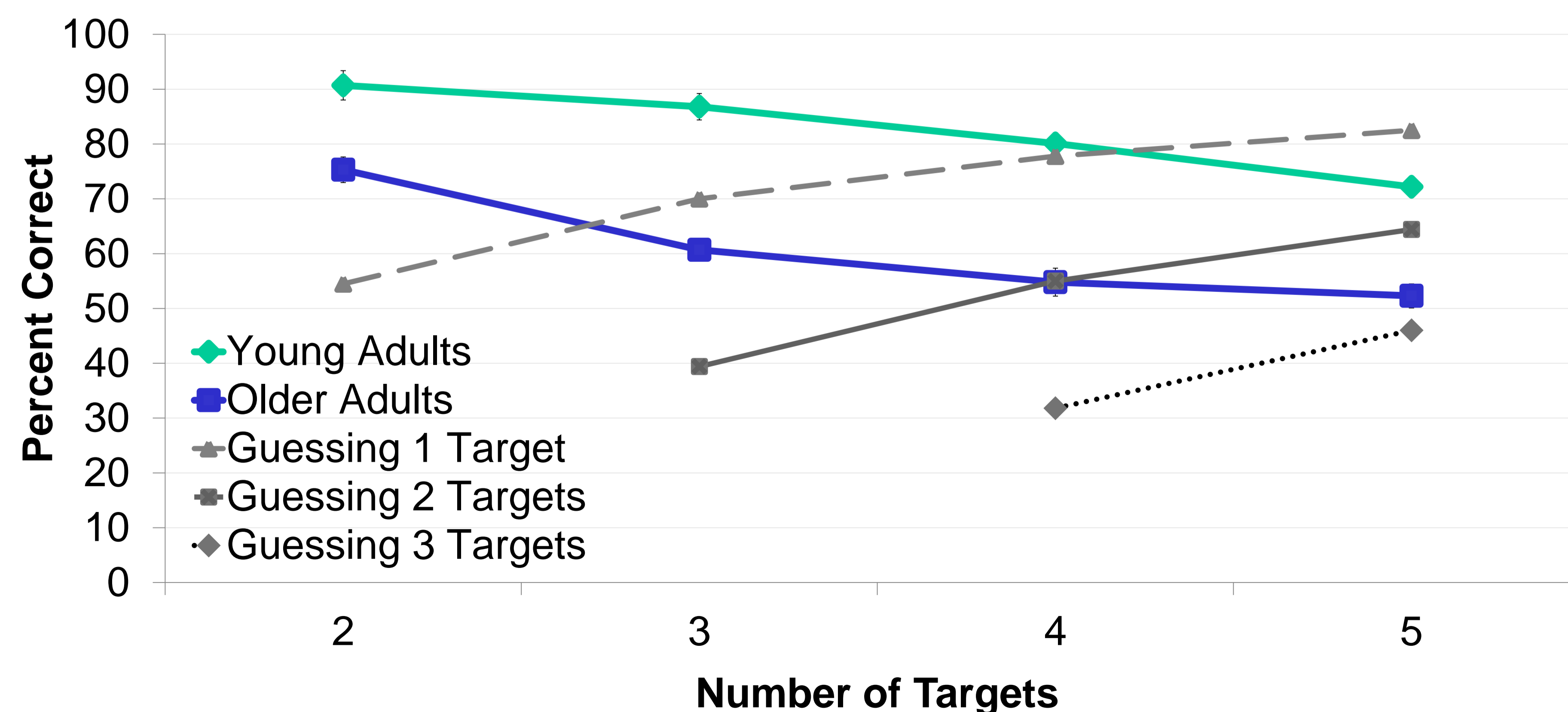
Accuracy decreased as the number of targets increased, $F(3,198) = 97.53, p < .0001$.

The Age x Target Number interaction, $F(3,198) = 7.55, p < .0001$, reflected a steeper decline in accuracy for older adults than for young adults as the number of targets increased.

We calculated accuracy rates if one or more targets was guessed rather than known (Freund, 1981; Trick, Perl, & Sethi, 2005). Comparing accuracy with guessing estimates, the following pattern emerged:

Young adults: track 4: guess 1; track 5: guess 1
 Older adults: track 3: guess 1; track 4: guess 2; track 5: guess 2.

Object Tracking Accuracy



Conclusions

As predicted, older adults tracked objects with lower accuracy than young adults.

Young adults successfully tracked 3-4 objects, and older adults tracked 2-3 objects.

The findings suggest that deficits in selective attention and/or working memory made it more challenging for older adults to track multiple objects.

Future research could tease apart attention and memory contributions to age deficits in MOT by manipulating the number of distracting objects or the amount of time objects are tracked.

We are also interested in training effects (e.g., video game training) on older adults' tracking ability.