

Age-related Difference In Visual Search And The Effect Of Distractor Suppression

Nwabunwanne Emele, (emelenwabu@gmail.com), Karin Reuwsaat, Brunno Freitas, Gabrielly Mansour, Jeremy Wolfe, Rogerio Panizzutti; Birgham & Women's Hospital /Harvard Medical School, Federal University of Rio de Janeiro

INTRODUCTION / BACKGROUND

Aging is accompanied by declines in cognitive, perceptual, and physiological processes that shape how individuals visually explore their environment. This study employed a conjunction visual search paradigm to investigate age-related differences in search efficiency and attentional control.

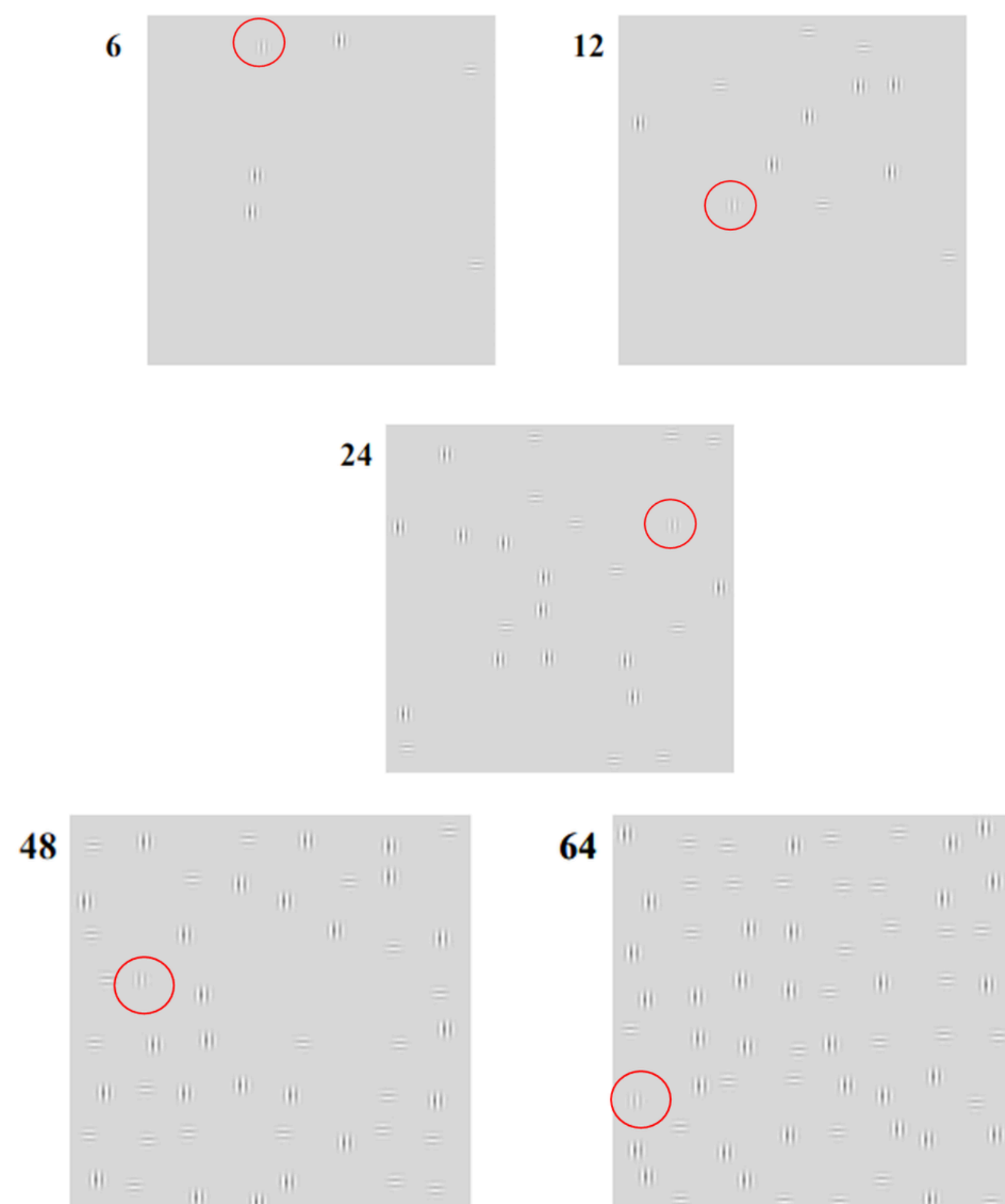
OBJECTIVES

- Evaluate for age related differences in search performance in a conjunction visual search experiment.
- Examine if older adults will exhibit difficulty in the strategic filtering of high contrast distractors to identify a low contrast target.
- Examine for search performance differences between healthy older adults (HOA) and mild cognitively impaired older adults (MCI)

METHOD

Participants were 49 Cognitively Unimpaired Adults (Age > 18 years), and 22 Mildly Cognitive Impaired Older Adults (Age >60)..

Conjunction search task:



Experiment consists of 5 set size conditions i.e 6, 12, 24, 48, 64 stimuli. Targets are patches of low contrast with vertical line orientation. 50% of distractors consist of vertical line orientation and high contrast and the other 50% consist of horizontal line orientation and low contrast. 100 total trials (80 experimental and 20 practice)

RESULTS

	Cognitively unimpaired Adults N = 49 Mean (S.D)	Mild Cognitively Impaired Older Adults (MCI) N = 22 Mean (S.D)	Statistics (P - value)
Age	46.35 (23.98)	71.86 (9.57)	<0.01
MoCA	27.37 (2.14)	21.17 (2.43)	<0.01
Male/Female	11/38	9/13	

Table 1. Demographic characteristics: Comparison between groups were performed using Mann-Whitney test for age and MoCA score. Values are shown as mean (M) and standard deviation (SD). MoCa range 0-30 points

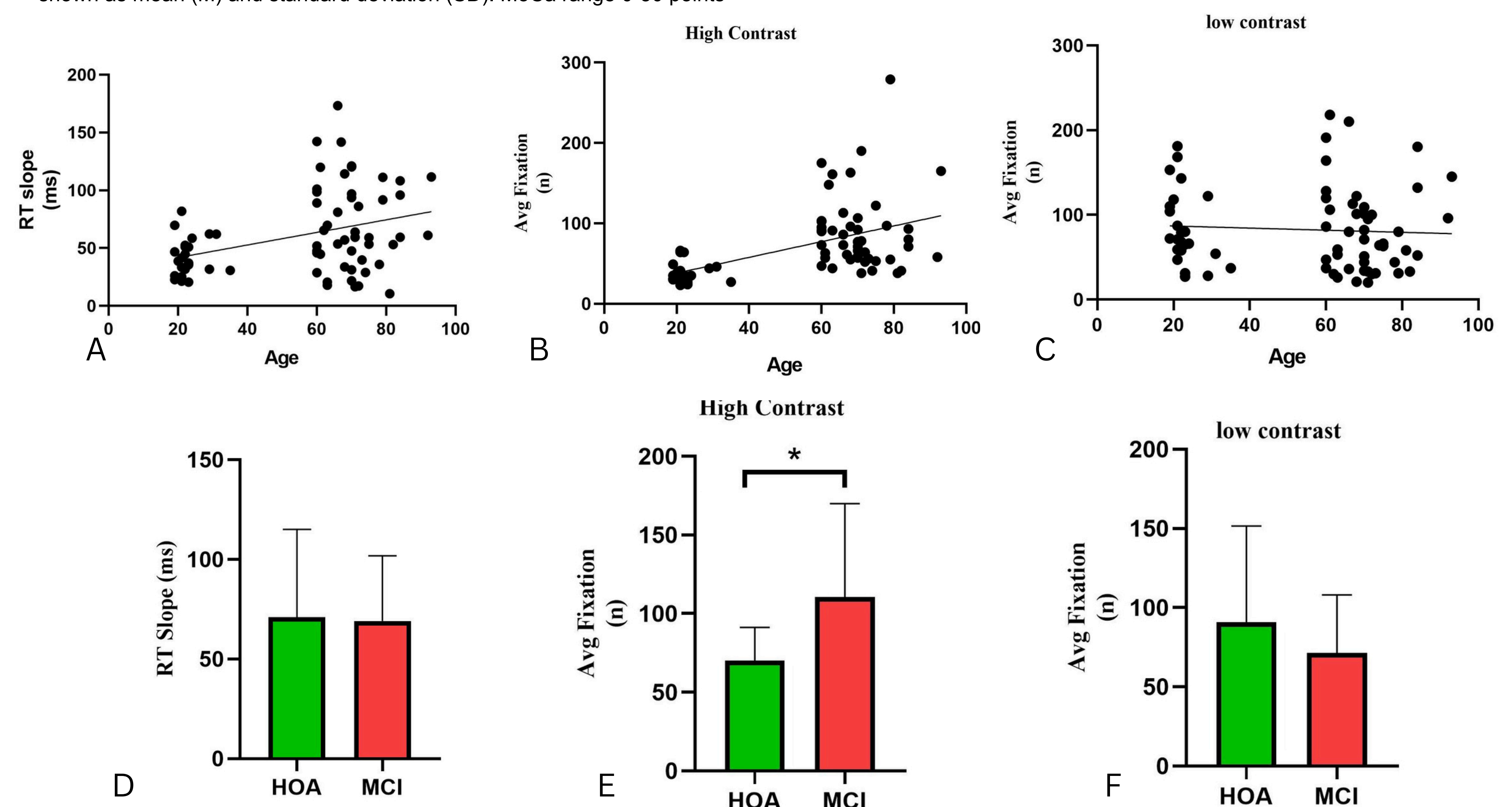


Fig.1. (A) Overall performance: Positive association between RT and age ($\rho = 0.2942$, $p = 0.013$). (B) Positive association between age and number of fixations to the high contrast distractors ($\rho = 0.505$, $p < 0.01$). (C) No significant association between age and number of fixations to the low contrast distractors ($\rho = -0.17$, $p = 0.156$). (D) No significant differences between Healthy Older Adults (HOA) and Mild Cognitively Impaired Older Adults (MCI) for RT slope values ($t = 0.168$, $P = 0.868$). (E) Significant group difference between HOA and MCI for average fixation on high contrast distractors ($U = 158$, $P = 0.012$). (F) No observed significant difference between groups for average fixation to low contrast distractors ($U = 237.5$, $P = 0.431$).

CONCLUSION

- Age-Related Slowing in Conjunction Visual Search - Older adults require more time to identify targets as search complexity increased.
- Ageing and Increased Attentional Capture by Salient Distractors - Older adults show reduced ability to inhibit gaze toward irrelevant but highly salient stimuli.
- Differences in Distractor Processing Between Healthy Older Adults and MCI - Individuals with MCI exhibit greater difficulty suppressing salient irrelevant information.
- Age-related declines in attentional control and visual exploration contribute to poorer performance in complex visual search tasks.

FUNDING SOURCES

Fundação de Amparo à Pesquisa do Estado do Rio de Janeiro (FAPERJ) (Grant E-26/110.305/2014), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) (Grant 400455/2012-9), and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) - finance code 001.