



AOTA Critically Appraised Topics and Papers Series
**Driving and Community Mobility
for Older Adults**

**A product of the American Occupational Therapy Association's
Evidence-Based Literature Review Project*

CRITICALLY APPRAISED PAPER (CAP)

Focused Question

What is the evidence for the effect of interventions to address cognitive and visual function, motor function, driving skills intervention, self-regulation/self-awareness, and the role of passengers and family involvement in the driving ability, performance, and safety of the older adult? Intervention approaches include adaptation, remediation, prevention, and maintenance.

Ball, K. K., Beard, B. L., Roenker, D. L., Miller, R. L., & Griggs, D. S. (1988). Age and visual search: Expanding the useful field of view. *Journal of the Optical Society of America*, 5, 2210–2219.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

Older adults report difficulty with activities that require peripheral vision, such as driving and mobility in general. Perimetry tests measure only lighted targets and not the clutter experienced in the real world of peripheral vision. In addition, research has shown that older adults have difficulty processing information in the peripheral visual fields.

RESEARCH OBJECTIVE(S)

List study objectives.

The purpose of this study was to examine how aging and practice affect the extent of the peripheral field within which a target can be localized, while manipulating several variables that make this task difficult for older observers. The researchers wanted to determine if distractors affect one's ability to attend to a central task or useful field of view. The researchers examined the effects of training on visual localization of a target with distractors.

A long-term goal was to determine the bases for age-related decrements in visual processing as well as for improved performance after practice and to gain a better understanding of how these changes affect the functional vision available to older adults on a daily basis.

DESIGN TYPE:

Randomized control trial

Level of Evidence:

I

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *If no, explain.*

Yes

No

SAMPLE SELECTION

How were subjects selected to participate? Please describe.

Convenience sample—volunteers

Inclusion Criteria

Younger and middle-aged adults were in good ocular health. All older subjects lived independently in the community and were in good general health. Ocular health was generally good, with lens density typical of aging. Oldest age group had good visual acuity, but differed significantly from the younger groups.

Exclusion Criteria

Specific information other than in the inclusion criteria not reported

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

SAMPLE CHARACTERISTICS

N = 24

% Dropouts

#/(%) Male

#/(%) Female

Ethnicity

Disease/disability diagnosis

NR = Not reported.

Check appropriate group:

<20/study group <input checked="" type="checkbox"/>	20–50/study group	51–100/study group	101–149/study group	150–200/study group
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Sample Characteristics Bias: If no, explain.

If there is more than one study group, was there a similarity between the groups?

Yes

No

Were the reasons for the dropouts reported?

Yes

No

INTERVENTION(S)—Included are only those interventions relevant to answering the evidence-based question.

After initial pretesting, each age group was randomly divided into 2 training groups. Training was on the Useful Field of View (UFOV), where subjects were given a stimulus on a computer screen and asked to identify what they saw embedded with distractors. One group received high distractors (47) and another group received low distractors (23). Each subject received 6 blocks of trials per practice session, 2 under each of the 3 conditions, for 5 training sessions. After training, each observer was retested under the initial 9 conditions to assess the effects of training.

Add groups if necessary.

Group 1

Brief Description	Low distractors in training
Setting	University lab
Who Delivered?	Researcher, psychologist
Frequency?	Subjects received 6 blocks of trials
Duration?	5 training sessions

Group 2

Brief Description	High distractors in training
Setting	University lab
Who Delivered?	Researcher, psychologist
Frequency?	Subjects received 6 blocks of trials
Duration?	5 training sessions

Intervention Biases: *Explain if needed.*

Contamination

Yes

No

Co-intervention

Yes

No

Timing

Yes

No

Site

Yes

No

Use of different therapists to provide intervention

Yes

No

NR

MEASURES AND OUTCOMES—Included are measures relevant to answering the focused question.

Name of measure:

Useful Field of View (UFOV)

Outcome(s) measured (what was measured?):

Number of center task misses

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

Pretest, intervention, and posttest

Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes

No

Recall or memory bias? *If yes, explain.*

Yes

No

Others (list and explain):

Limitations (appropriateness of outcomes and measures) *If no, explain.*

Did the measures adequately measure the outcome(s)?

Yes

No

RESULTS

List results of outcomes relevant to answering the focused question.

Include statistical significance where appropriate ($p < 0.05$).

Include effect size if reported.

Change in performance for the middle and old age groups was significant. Change in performance, however, was not significant for the young group.

Was this study adequately powered (large enough to show a difference)? *If no, explain.*

Yes

No

Were appropriate analytic methods used? *If no, explain.*

Yes Researchers examined practice effects and placement of distractors.

No

Were statistics appropriately reported (in written or table format)? *If no, explain.*

Yes

No

CONCLUSIONS

State the authors' conclusions that are applicable to answering the evidence-based question.

The researchers concluded that before training, localization becomes increasingly difficult with increasing eccentricity. Older observers encounter more difficulty than do either young or middle-aged observers. The performance of middle-aged observers after practice closely resembles that of young observers before practice. The performance of older observers after practice closely resembles that of middle-aged observers before practice.

Were the conclusions appropriate for the Study Design (Level of Evidence)? *If no, explain.*

Yes

No

Were the conclusions appropriate for the statistical results? *If no, explain.*

Yes

No

Were the conclusions appropriate given the study limitation and biases? *If no, explain.*

Yes

No

IMPLICATIONS FOR OCCUPATIONAL THERAPY

This section provides guidance about clinical practice, program development, and other implications of the study findings as they relate to the focused question.

This study determined that the total visual field area, in which useful information can be acquired without eye and head movement (UFOV), reduces with age. This may have an impact on the task of driving, as drivers must be aware of and respond to objects and events in the driving scene. Yet, it is unclear that training on UFOV would actually transfer to improvement in everyday activities such as driving.

This work is based on the evidence-based literature review completed by Linda Hunt, PhD OTR.

CAP Worksheet adapted from: Critical Review Form – Quantitative Studies ©Law, M., Stewart, D., Pollack, N., Letts, L., Bosch, J., & Westmorland, M., 1998, McMaster University. Used with permission.

For more information about the Evidence-Based Literature Review Project, contact the American Occupational Therapy Association, 301-652-6611, x 2052.



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Contact: copyright@aota.org