



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.

Mazer, B. L., Sofer, S., Korner-Bitensky, N., Gelinas, I., Hanley, J., & Wood-Dauphinee, S. (2003). Effectiveness of a visual attention retraining program on the driving performance of clients with stroke. *Archives of Physical Medicine and Rehabilitation*, 84, 541–550.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

Prior research showed that older adults with diminished visual attention had higher accident rates than older adults without impaired visual attention. The study is based on the idea that if impaired visual attention is improved through training, then driving performance may also improve. Since people with strokes usually have impaired visual attention, this would be a group to retrain in an attempt to improve impaired visual attention.

RESEARCH OBJECTIVE(S)

List study objectives.

To evaluate the effectiveness of a visual attention retraining program using the Useful Field of View (UFOV) visual attention analyzer compared with traditional visuoperception treatment on the driving performance of clients with stroke as indicated by a pass or fail on the on-road driving evaluation. The secondary objective was to determine the effects of UFOV training on visuoperception and attention.

DESIGN TYPE:

Randomized controlled trial with stratified block design

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.

Consecutive—in the order entering clinic or program

Inclusion Criteria

All clients were recruited from acute care and rehabilitation centers in the Montreal area. Inclusion criteria were a hemispheric stroke that occurred within the previous 6 months, licensed to drive before the referent stroke, having driven in the 6 months before the stroke, and desire to return to driving.

Exclusion Criteria

Exclusion criteria included those indicated by the Canadian Medical Association: visual homonymous hemianopsia, primary visual impairment inadequately improved with corrective lenses, class IV cardiac status, and seizure activity within the previous year. In addition, clients with a bilateral lesion; cerebellar or brainstem stroke; severe cognitive deficit as indicated by a score of less than 6 on the Pfeiffer Short Portable Mental Status Questionnaire; severe perceptual, comprehension, or motor deficit, as determined by the treating medical team; or an inability to communicate in English or French. Eligible subjects were included in the study if they were willing to participate in either 20-session retraining program, were available during daytime hours, and agreed to sign an informed consent form.

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

SAMPLE CHARACTERISTICS

$N = 97$

% Dropouts 15 Subjects dropped out for the following reasons: became medically unfit to drive ($n = 3$), decided not to return to driving ($n = 5$), moved ($n = 1$), were unable to drive due to legal infractions ($n = 1$), and were deceased ($n = 3$). In addition to the 84 who were tested, 2 subjects were tested on the visuoperception tests and the Test of Everyday Attention (TEA) but failed to complete the on-road evaluation.

#/(%) Male

#/(%) Female

Ethnicity

Disease/disability diagnosis

NR = Not reported

Check appropriate group:

<20/study group	20–50/study group <input checked="" type="checkbox"/>	51–100/study group	101–149/study group	150–200/study group
-----------------	---	--------------------	---------------------	---------------------

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.

Participants who agreed to participate in the training program completed 20 training sessions and were then reassessed on the UFOV to identify changes in performance after training. Training on the UFOV consisted of manipulating several parameters that enabled practice sessions to be offered at a level of difficulty appropriate to the individual participants. Training was on 3 modules: processing speed, divided attention, and selective attention.

Add groups if necessary

Group 1

Brief Description	Training Group with UFOV (computer with touch screen)
Setting	Hospital Rehabilitation Department
Who Delivered?	Occupational therapist
Frequency?	20 training sessions
Duration?	30–60 minutes per session (mean 34 minutes), 2–4 sessions per week

Group 2

Brief Description	Session using commercial software to retrain perceptual and cognitive functions except for visual processing (computer with touch screen)
Setting	Hospital Rehabilitation Department
Who Delivered?	Occupational Therapist
Frequency?	20 training sessions
Duration?	30–60 minutes per session (mean 43 minutes), 2–4 sessions per week

Intervention Biases: *Explain, if needed.*

Contamination

Yes

No

Co-intervention

Yes It is not explained what other types of therapy participants may be engaged in.

No

Timing

Yes It is possible that the sequelae of stroke may have contributed to results.

No

Site

Yes

No

Use of different therapists to provide intervention

Yes

No

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

Name of measure:

On-road driving evaluation

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

Driving behaviors, knowledge, application of driving regulations, and ability to maneuver the vehicle safely

Is the measure reliable (as reported in article)?

Yes Interrater reliability of the pass, fail, or lessons rating was 100%.

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?

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):

Name of measure:

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

Is the measure reliable (as reported in article)?

Yes Test-retest reliability of .70

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?

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 It is not clear. The study seems to have measured performance on a visual attention analyzer, but the retest was the same measure trained on rather than another measure of visual attention that would have been new to the participant.

RESULTS

List results of outcomes relevant to answering the focused question.

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

Include effect size if reported.

There was a significant difference in the training group ($p = .009$) on divided attention and selective attention ($p = .0001$). There was not a significant difference in processing speed ($p = .09$).

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

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.

Eighty-four participants completed the outcome evaluation. There were no significant differences between groups on any of the outcome measures. In addition, there was no significant difference between experimental and historical control group (Group 3) with respect to passing on the driving test. There was, however, an almost 2-fold increase (52.4% vs. 28.6%) in the rate of success on the on-road driving evaluation after UFOV training for subjects with right-sided lesions. Rehabilitation that targets visual attention skills was not significantly more beneficial than traditional perceptual training in improving the outcome of on-road driving evaluation. However, results suggest a potential improvement for subjects with right-sided lesions, indicating that training must target specific skills.

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 The diagnosis of stroke may lead to multiple deficits in vision and perception. It may be that participants needed to be screened for a specific visuoperception problem to know if this particular training has an impact. In addition, there was no pretest driving evaluation.

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.

- It is unknown whether improved performance on the UFOV visual attention analyzer translates into improved functional performance on an activity such as driving. Improvement may be attributed to the training on the evaluation measure. Additionally, the sequelae of stroke may have resolved some of the visual attention problems over time.
- Preliminary results suggest that the UFOV may be a useful tool to assist occupational therapists in the treatment of impairments in visual attention, but the impact of this approach to training on the performance of functional tasks is not yet known.
- It is difficult to make conclusions from this study, as driving skills were not evaluated prior to the interventions used.
- Preliminary results suggest that the UFOV may be a useful tool to assist occupational therapists in the treatment of impairments in visual attention for those with right-sided brain lesions. Again, this is a stretch since both a pre- and postdriving test were not administered.

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.



Copyright 2007 American Occupational Therapy Association, Inc. All rights reserved.
For personal or educational use only. All other uses require permission from AOTA.
Contact: copyright@aota.org