



AOTA Evidence Briefs

Brain Injury

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

BI #12

Compensatory strategies may improve visual processing in people with acquired brain injuries

Dirette, D. K., & Hinojosa, J. (1999). The effects of a compensatory intervention on processing deficits of adults with acquired brain injuries. *Occupational Therapy Journal of Research, 19*, 223–240.

Level: IIBb

Nonrandomized controlled trial, 2 groups, less than 20 participants per condition, moderate external validity (internal validity not reported)

Why research this topic?

Acquired brain injury is “trauma to the head or an internal pathology that results in damage to the brain, a loss of consciousness, and neurological impairments.” Persons with acquired brain injury commonly have difficulty processing or decoding incoming information. Rehabilitation may rely on remediation (improvement of performance subcomponents) or compensation (improvement of function through adaptive strategies). The latter approach is appropriate for occupational therapy because of its link to daily activities and performance.

What did the researchers do?

The researchers, of Western Michigan University (Kalamazoo) and New York University, respectively, designed a study to examine the effects of three compensatory strategies for visual processing—verbalization, chunking, and pacing. Verbalization involves orally repeating information gathered visually, chunking entails grouping information into segments to condense it, and pacing consists of pausing intermittently to decrease the effects of interference.

The study involved 20 men and 8 women, whose average age was 38 years and whose average time since injury was 5 months. They were first matched according to severity of injury, gender, age range, and time since injury. They then were randomly assigned to an experimental group or a control group. Treatment for the experimental group involved computerized instruction in verbalization, chunking, and pacing, in that order. Treatment for the control group consisted of remedial computer activities. All participants received six 1-hour treatment sessions, 1 week apart. At session one a speech pathologist conducted a pretest and the researchers took the first of weekly measures. At sessions two through five the participants received treatment for 45 minutes, within their assigned group, followed by weekly measures. At session six the speech pathologist conducted a posttest, and the researchers again took weekly measures.

The outcome area of interest to the researchers was *visual processing* (as measured by performance on functional computer tasks, the Paced Auditory Serial Addition Test, and the Matching Accuracy Test of the Brain game).

What did the researchers find?

The two groups improved **significantly** (*see Glossary*) from the measure of function taken before the intervention to the measure taken afterward, and on the weekly measures, but there was no difference in performance attributable to the intervention.

An auxiliary analysis, however, revealed that 80% of the participants in both groups used compensatory strategies. Those in the control group generated these strategies on their own.

What do the findings mean?

- For *therapists and other providers*, the findings suggest that the three compensatory strategies used in this study can produce improvements in functional measures in clients with acquired brain injury. More research is needed, however, to confirm any advantage that compensatory strategies may have over remedial strategies.
- The findings should encourage confidence in the use of compensatory strategies by occupational therapists. The findings also suggest a direction for research: an investigation of the process by which people gain the ability to use compensatory strategies, examination of people's ability to generate compensatory strategies on their own, and study of the carryover of compensatory strategies outside the clinic.

What are the study's limitations?

The researchers' method of selecting their study participants was not systematic; that is, their participants were people convenient to them. This flaw in the study's design lowers confidence that the results can be attributed to the intervention.

The study provides useful information. However, it has limited generalizability for the population of persons with traumatic brain injury across settings because the participants did not represent all age ranges and all types of head injuries.

Glossary

significance (or significant)—A statistical term, this refers to the probability that the results obtained in the study are not due to chance, but to some other factor (such as the treatment of interest). A significant result is one that is likely to be generalizable to populations outside the study.

Significance should not be confused with clinical effect. A study can be statistically significant without having a very large clinical effect on the sample. For example, a study that examines the effect of a treatment on a client's ability to walk, may report that the participants in the treatment group were able to walk significantly longer distances than the control. However, if you read the study you may find that the treatment group was able to walk, on average, six feet, while the control group was able to walk, on average, five feet. While the outcome may be statistically significant, a clinician may not feel that a one foot increase will make his or her client functional.

- Terminology used in this document is based on two systems of classification current at the time the evidence-based literature reviews were completed: *Uniform Terminology for Occupational Therapy Practice—Third Edition* (AOTA, 1994) and *International Classification of Functioning, Disability and Health (ICIDH-2)* (World Health Organization [WHO], 1999). More recently, the *Uniform Terminology* document was replaced by *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), and modifications to *ICIDH-2* were finalized in the *International Classification of Functioning, Disability and Health* (WHO, 2001).

This work is based on the evidence-based literature review completed by Beatriz C. Abreu, PhD, OTR, FAOTA, and colleagues.

For more information about the Evidence-Based Literature Review Project, contact the Practice Department at the American Occupational Therapy Association, 301-652-6611, x 2040.

