AOTA Evidence Briefs
Substance-Use Disorders

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

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In mild to moderately impaired men with alcohol dependence, self-administered cognitive stimulation may produce experience-dependent recovery of neurological function that transfers to acquisition of elements of relapse prevention

Roehrich, L., & Goldman, M. S. (1993). Experience-dependent neuropsychological recovery and the treatment of alcoholism. *Journal of Consulting and Clinical Psychology*, *61*, 812–821.

Level: IB1a

Randomized control trial, less than 20 participants per condition, high internal validity, high external validity

Why research this topic?

Many alcoholics admitted to treatment facilities exhibit neuropsychological dysfunction, such as difficulty learning novel or complex tasks. Researchers have identified two mechanisms by which alcoholics recover some lost function: one that depends on time and one that depends on experience. The former occurs spontaneously; the latter requires external mental stimulation. An important finding in relation to experience-dependent recovery is "that training on one task will transfer not only to similar tasks but also to tasks only distantly related in content and format" (p. 812). However, previous research has focused primarily on transfer from one neuropsychological task to others, not to daily life skills.

What did the researchers do?

Roehrich and Goldman (1993), of the University of South Florida (Tampa), designed a study to test whether cognitive stimulation would help alcoholics respond positively to a specific component of alcoholism treatment, namely prevention of relapse. They also sought to assess whether self-administered cognitive stimulation would be effective and whether cognitive stimulation using traditional neuropsychological tasks would be more effective than cognitive stimulation using more "ecologically relevant" tasks (tasks more closely related to daily living).

The researchers recruited participants for their study from people successively admitted to the inpatient alcohol treatment program at the Veterans Administration Medical Center in Bay Pines, Florida. The sample consisted of 80 men, all with a primary diagnosis of alcohol dependence and all with mild to moderate neuropsychological impairment. Their average age was a little more than 42 years. Sixty-one of the men completed the study.

Within two age groupings (younger than 40 years, or 40 years and older), the participants were randomly assigned to one of four groups: neuropsychological remediation, ecologically relevant remediation, "placebo" (used here to mean an activity not thought to have much effectiveness), or control. The **control group** (see *Glossary*) received no intervention. The other groups received self-guided workbooks, which they completed during four 1-hour sessions spread over the last 2 weeks of their inpatient treatment. (They received the workbooks 10–12 days after admission.) The first two workbooks presented every exercise twice in a graded-difficulty format (simple and then more complex) and included an answer booklet in which the participants could check the accuracy of their answers. The neuropsy-

chological remediation group's workbook consisted of exercises graded in difficulty, progressing from simple connect-the-dots pictures, mazes, and missing-object tasks to more complex ones, such as Sternberg's digit symbol substitution task. The ecologically relevant remediation group's workbook consisted of exercises also graded in difficulty but promoting "sustained attention and the use of reasoning and problem-solving skills" (p. 815). The placebo group's workbook required the participants "to respond to statements about alcoholism and then to provide a written rationale for their choices" (p. 815).

The outcome areas of interest were as follows: *acquisition of the elements of relapse prevention* (as measured by an RP [Relapse Prevention] Content Test); *patients' awareness of their level of functioning* (as measured by the Patient Assessment of Own Functioning Inventory); *intellectual and neuropsychological functioning* (as measured by the Shipley Institute of Living Scale, the Digit Symbol subscale of the Wechsler Adult Intelligence Scale–Revised, and the Halstead Trail-Making Test); *depression* (as measured by the Beck Depression Inventory); and anxiety (as measured by the State–Trait Anxiety Inventory). All instruments were administered before and after the intervention except the Shipley Institute of Living Scale, which was administered before the intervention only.

What did the researchers find?

The two remediation groups showed **significant** (see *Glossary*) improvement across the two assessments of intellectual and neurological functioning. They also exhibited considerably more improvement than the placebo or control groups on those measures. These findings established that experience-dependent recovery had indeed occurred. There were **no significant** (see *Glossary*) differences between the two remediation groups, however.

The two remediation groups also showed more improvement than the placebo and control groups on the two transfer tasks (contained in the Digit Symbol subscale). These findings established that transfer had indeed occurred. Again, the two remediation groups achieved similar results with no significant difference between the two forms of remediation. The neuropsychological remediation group performed significantly better than the placebo or control group on the test of acquisition of the content of relapse prevention. Both remediation groups also performed significantly better than the placebo or control group on the test of acquisition of the "cognitive flexibility" ("the capacity to generate alternative solutions to high-risk situations"—p. 817) needed for relapse prevention. The neuropsychological remediation group performed slightly better than the ecologically relevant remediation group.

On the measure of depression, the two remediation groups showed a significantly greater decrease than the other groups, and on the measure of awareness of level of functioning, they showed a significantly greater increase in cognitive self-appraisals.

There were no differential effects of cognitive stimulation by age. Both those younger than age 40 and those age 40 and older showed recovery of function.

What do the findings mean?

For therapists and other providers, the findings suggest that in mild to moderately impaired men with alcohol dependence, self-administered cognitive stimulation using traditional neurological tasks or ecologically relevant tasks can produce experience-dependent recovery of neurological function. Further, they suggest that the learning can transfer to acquisition of a specific component of alcoholism treatment, namely relapse prevention. Cognitive stimulation using traditional neurological tasks may have a slight advantage over cognitive stimulation using ecologically relevant tasks.

The fact that the remediation was self-administered should be of interest to health care administrators and policy makers. The availability of self-guided manuals should make cognitive stimulation more accessible to treatment programs.

What are the study's limitations?

The study has one limitation: The test used to measure acquisition of the elements of relapse prevention was not tested for reliability and validity.

GLOSSARY

control group—A group that received special attention similar to that which the treatment group received but did not receive the treatment.

nonsignificant (or no significance)—A statistical term that refers to study findings that are likely to be due to chance differences between the groups rather than to other factors (e.g., the treatment of interest). A nonsignificant result is not generalizable outside the study. Like significance, a nonsignificant result does not indicate the clinical effect. Often studies will show nonsignificant results, yet the treatment group's mean will be better than the control group's. This is usually referred to as a trend in the right direction. Because significance is closely determined by sample size, nonsignificant results would often become significant if the sample size were increased.

significance (or significant)—A statistical term that refers to the probability that the results obtained in the study are not due to chance but to some other factor (e.g., the treatment of interest). A significant result 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 those in the control group. However, after reading the study one may find that the treatment group was able to walk, on average, 6 feet, whereas the control group was able to walk, on average, 5 feet. Although the outcome may be statistically significant, a clinician may not feel that a 1-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).

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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.

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