



# AOTA Evidence Briefs

## School-Based Interventions

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

### SCH #2

## Self-instruction may improve children's handwriting skills

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Robin, A. L., Armel, S., & O'Leary, K. D. (1975). The effects of self-instruction on writing deficiencies. *Behavior Therapy*, 6, 178–187.

### Level: IB2b

Randomized controlled trial, fewer than 20 participants per condition, moderate internal validity, moderate external validity

### Why research this topic?

Research on the effects of self-instruction (a form of self-guided verbalization) on children's performance on standardized tests has produced mixed results. In 1971 a pair of researchers concluded that self-instruction had a therapeutic effect on performance. In 1973 a researcher replicating the 1971 study found no **significant** (see *Glossary*) differences in the performances of children using self-instruction and children receiving direct training.

### What did the researchers do?

Robin and his colleagues (1975), of the State University of New York at Stony Brook, designed a study to compare the effects of self-instruction and direct training on children's handwriting. The participants were 30 kindergarten children in a local elementary school. They represented the 15 lowest scorers from two classrooms on a handwriting test administered to all kindergartners. The children's teachers confirmed that these children had handwriting deficiencies. Seventeen were boys; 13 were girls. Their average age was 5.5 years.

The researchers randomly assigned the children to one of three groups: self-instruction, which included feedback, reinforcement, and self-instruction training; direct training, which included feedback and reinforcement; or control. Equal numbers from each class were assigned to each group.

Experimenters worked individually with the children in the direct-training group about three times a week for 7 weeks (for a total of 20 sessions). During each session the children copied two training letters seven times each. As they worked, the experimenters gave them feedback on their responses and praise for the correct ones.

Experimenters trained the self-instruction group in a five-step procedure for guiding themselves to copy the letters. The procedure involved, among other activities, the children talking aloud to themselves about what they had to do and how to do it. The children then copied letters as the direct-training children did, and received similar feedback and praise.

The **control group** (see *Glossary*) received no intervention.

The outcome area of interest was *children's performance in writing four uppercase letters on which they received training, and uppercase letters on which they received no training* (as measured by points earned for conformity to certain criteria).

Before the intervention began, the researchers tested the children on the training letters and on other letters, the latter to test for generalization. They conducted similar tests after the intervention concluded.

## What did the researchers find?

Both intervention groups performed **significantly** (see *Glossary*) better than the control group on the training letters. Also, the self-instruction group performed significantly better than the direct-training group.

## What do the findings mean?

For therapists and other providers, the findings suggest that self-instruction plus direct training is more effective than direct training alone in improving children's handwriting deficiencies. However, self-instruction as formulated for this and earlier studies may be limited in practicality. It is difficult to teach and cumbersome to implement. Also, it may account for only a small part of the effect.

## What are the study limitations?

The study has several limitations. First, the sample size is small and may lack the power to detect meaningful differences between intervention groups. Although self-instruction appeared to be effective in improving children's handwriting, study findings are inconclusive regarding the specific mediating role of verbalizations in self-instructional handwriting training. Furthermore, evaluators were aware of the purpose of the study and group assignments, which may have influenced the results. Variations in the amount and quality of social reinforcement given to participants may have also influenced student performance and outcomes.

## Glossary

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

**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, 6 feet, while 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).

This work is based on the evidence-based literature review completed by Mary Law, PhD, OT(C); Nancy Pollock, MSc, OT(C); Debra Stewart, BSc, MSc, OT(C); Brenda McGibbon Lammi, BPHE, BHSc (OT), MSc.

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.

