



# AOTA Evidence Briefs

## School-Based Interventions

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

### SCH #6

## **Occupation-based activity intervention may yield gains in measures of intelligence and language/communication in children ages 2 to 6 years old.**

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Barcai, A., Umbarger, C., Pierce, T. W., & Chamberlain, P. (1973). A comparison of three group approaches to under-achieving children. *American Journal of Orthopsychiatry*, 43, 133–141.

#### **Level: IIB3b**

Nonrandomized controlled trial, 2 groups, fewer than 20 participants per condition, low internal validity, moderate external validity

#### **Why research this topic?**

Projects to improve the academic performance of underachieving children from low socioeconomic backgrounds have used varying approaches but have failed to identify the single most effective aspect of their approach.

#### **What did the researchers do?**

Barcai, of the University of Pennsylvania, Philadelphia, and his colleagues (1973) sought “to determine which of...three approaches would be most effective in upgrading intelligence and improving classroom behavior with the least amount of personnel or structural changes within the school” (p. 134). The three approaches they studied were an art activity, which represented an action-oriented approach; group counseling, which represented a language-oriented approach emphasizing discussion of thoughts and feelings as well as listening; and group remediation, which represented a language-oriented approach emphasizing formal teaching and learning of skills.

The participants in the study were 62 fourth- and fifth-grade students (gender and average age not reported) from an urban elementary school serving a low socioeconomic population. They came from two classes in the school's middle track, designated for students not achieving at grade level but capable of better performance. The children were assigned to one of three groups corresponding to the approach to be followed. The researchers used a matching procedure to make the groups as similar as possible in age, gender, grade, achievement test scores, and severity of behavior problems.

Two graduates of a local art college led the art activity group. They were instructed “to be benevolent, exciting, and support the children creatively” (p. 137). There was no express focus on communication skills in this group. “Instead, children acted freely and spontaneously through the art medium” (p. 137).

The counseling group involved children in discussions of their understanding of themselves and their effects on others. The group leaders, two of the researchers, emphasized the importance of listening to others. The approach to communication skills was a focus on “the ‘whys,’ and on understanding cause and effect, and their implications for one's behavior” (p. 137).

In the remediation group, the children performed tasks structured like games (e.g., a listening task based on the game Simon Says and a categorizing task based on the game Twenty Questions). The children performed the tasks in front of a one-way mirror while two classmates at a time judged them from behind it. Judging was based on student performance rather than behavior. The approach to communication in this group was a focus on the “hows,” on achieving mastery through participation in games of skill.

All three interventions consisted of 14 1-hour sessions over 14 weeks.

The outcome areas of interest to the researchers were *intelligence* (as measured by the Coding, Digit Span, Similarities, and Picture Completion subtests of the Wechsler Intelligence Scale for Children or the Wechsler Bellevue, used alternately); *storytelling* (as rated by three independent evaluators); and *classroom behavior* (as rated by the teachers of the two classes from which the participants came). Regarding the latter outcome area, the researchers expected the two teachers involved in the study to “react differently to any changes in the behavior of their pupils introduced by the three intervention procedures” (p. 135) because the two teachers were distinctly different in personality and the kind of environmental climate they created in their classrooms.

A fourth outcome area of interest, *achievement* (as measured by the Iowa achievement tests), is reported in a later article (presumably).

### **What did the researchers find?**

On the intelligence measure, the counseling and remediation groups improved **significantly** (see *Glossary*) from before the intervention to after it, on each subtest, and on the average of the four. The remediation and counseling groups improved significantly more than the art activity group. The counseling and remediation groups differed significantly on only one measure, Coding, with the remediation group performing better.

On the storytelling measure, there was **no significant** (see *Glossary*) difference between the counseling and remediation groups, so the researchers combined their results. The difference between the combined group and the art activity group was significant, with the combined group clearly improving more on its second story than the art activity group did.

On the measure of classroom behavior, the fourth-grade teacher perceived the behavior of all children in his grade as having significantly improved, whereas the fifth-grade teacher perceived the behavior of all children in his grade as having significantly deteriorated.

### **What do the findings mean?**

For therapists and other providers, the findings suggest that structured, time-limited intervention with underachieving students from a low socioeconomic urban area may produce temporary gains on intelligence subtests and in storytelling ability. Structured, programmed intervention appears to be more effective in upgrading intellectual achievement than unstructured, caring interventions. In this study, both counseling (conversational approach) and remediation (task-oriented approach) appear to be equally beneficial.

### **What are the study's limitations?**

This study has several limitations. Baseline test scores revealed that the counseling group and remediation group were similar but differed significantly from the art activity group prior to intervention. This initial group inequality may have contributed to the results of this study. Differences in teacher expectations and attitudes towards students and interventions also may have influenced student performance and outcomes. Similarly, evaluators were aware of the participant group status as well as the purpose of the study. Lastly, the sample size may be too small to detect other statistically significant or clinically important differences between intervention groups.

## Glossary

**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 (like 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, 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).

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