



# AOTA Evidence Briefs

## Developmental Delay in Young Children

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

### DD #5

## Sensory integrative therapy improves reading skills in children at risk for reading failure

Grimwood, L. M., & Rutherford, E. M. (1980). Sensory integrative therapy as an intervention procedure with Grade One “at risk” readers—a three-year study. *Exceptional Child*, 27, 52–61.

### Level: IB1a

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

### Why research this topic?

Many children with learning disabilities also show signs of inadequate **sensorimotor** (see *Glossary*) development. Researchers have studied remedial approaches to supplement classroom teaching. Strict scrutiny of such approaches is necessary before they are included in special education curricula.

### What did the researchers do?

Grimwood and Rutherford (1980), of the Western Australian Institute of Technology (Perth), set up a study to determine whether sensory integrative therapy was a beneficial intervention with children at risk for reading failure. Sensory integrative therapy helps patients organize their responses to sensory input.

In February 1976, of the 124 children in grade 1 of two primary schools in the Perth metropolitan area, 21 (16 boys and 5 girls) were identified using the Satz criteria (specified in other research studies) as being at risk for reading failure. Their average age was 5 years, 7 months. The researchers randomly assigned these children to a treatment or a **control group** (see *Glossary*). The resulting groups numbered 11 and 10, respectively. However, by the time of the first assessment after the intervention, the researchers had dropped two children from the treatment group because of extended absences. Further, at the 2-year follow-up, they were unable to contact one child in the treatment group and one in the control group.

All the children in the study were assessed regarding their sensory integrative function. Subsequently the treatment group received sensorimotor therapy according to an individualized education plan based on the results of the assessment. The children left the classroom on a rotating basis for therapy so that no child was regularly absent from a particular lesson. The therapy took place in two 30-minute periods a week, for 24 weeks. It provided controlled sensory input with a particular emphasis on the children’s tactile, **proprioceptive** (see *Glossary*), and **vestibular** (see *Glossary*) systems. The therapists also employed neuromuscular therapy in conjunction with sensory integrative therapy to facilitate postural and equilibrium reactions. Further, they provided activities to encourage bilateral motor coordination, to assist automatic crossing of the midline of the body, and to develop gross and fine motor skills. For example, therapy with one child involved, in part, his hitting a large ball with both hands to help him integrate motor movement and cross his midline without hesitation.

The outcome areas of interest to the researchers were *reading-related skills* (as measured by the Iota Word Test at the end of the intervention period [November 1976], by the St. Lucia Graded Word Reading Test 1 year later [November 1977], and by the Neale Analysis of Reading Ability [Accuracy and Comprehension] and the St. Lucia test 2 years later [November 1978]).

## What did the researchers find?

The children in the treatment group achieved **significantly** (see *Glossary*) higher scores than the children in the control group on all the tests. Also, their results on all the tests were on a par with those of the total group in their grade.

## What do the findings mean?

- The findings support the use of sensory integrative therapy with children at risk for reading failure. Not only were significant gains present at the end of the intervention, but they were sustained over the 2 years following.
- The findings should boost confidence in funding programs that use sensory integrative therapy with children at risk for reading failure. They also suggest a productive direction for research—for example, replicating the study using a larger sample and a longer intervention period, and identifying children at risk by another means.

## What are the study's limitations?

- The study began in 1976 (30 years ago).
- The SCSIT battery was used as outcome measure.
- Small sample size.
- Individualized treatment; not replicable.
- How subjects were determined to be at risk for reading failure was not stated.
- How 21 subjects were randomly allocated was not clear.
- The control group received no treatment; possible Hawthorne effect for treatment subjects.
- Only a single case study was offered within this article.

## Glossary

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

**proprioceptive**—capable of receiving stimuli originating in the muscle, tendons, and other internal tissues.

**sensorimotor**—of, relating to, or functioning in both sensory and motor aspects of bodily activity.

**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, 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.

**vestibular**—relating to balance.

- 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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