



AOTA Evidence Briefs

Developmental Delay in Young Children

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

DD #8

Therapist-directed structured sensorimotor therapy and child-initiated sensorimotor exploration have beneficial outcomes for preschoolers with sensorimotor problems

DeGangi, G. A., Wietlisbach, S., Goodin, M., & Scheiner, N. (1993). A comparison of structured sensorimotor therapy and child-centered activity in the treatment of preschool children with sensorimotor problems. *American Journal of Occupational Therapy*, 47, 777–786.

Level: IB2a

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

Why research this topic?

Researchers have largely neglected to study the most effective ways to engage children with **sensorimotor** (see *Glossary*) deficits in therapy. Yet current theoretical thinking about sensorimotor performance calls for the child to be an active participant in the intervention.

What did the researchers do?

DeGangi and her colleagues (1993), variously affiliated with the Reginald S. Lourie Center for Infants and Young Children and the Ivymount School (both in Rockville, MD), compared the performance of preschool children with sensorimotor dysfunction under two types of therapeutic approaches. One emphasized child-initiated sensorimotor exploration during play interactions, and the other used therapist-directed, structured sensorimotor activities.

For inclusion in the study, children had to display motor delay, sensory processing disorder, or motor planning deficits. Children were excluded if they had moderate to severe cerebral palsy, major sensory impairments, major orthopedic handicaps, serious medical problems, or severe cognitive delays. Twelve children were chosen: 10 boys and 2 girls. They averaged 4.4 years in age.

Each child was tested, received 8 weeks of intervention under one approach, was tested again, and then received 8 weeks of intervention under the other approach. The order in which a child received the interventions was randomized. Six received the child-centered intervention first, and six the structured therapy intervention. Occupational therapists delivered the interventions once a week, 50 minutes at a time.

The researchers were interested in the following outcomes: *functional performance*, including self-care, fine motor skills, gross motor skills, and visuomotor skills (as measured by the Peabody Developmental Motor Scales and the therapists' observations); *months gained in fine and gross motor skills* (as measured by the Peabody Developmental Motor Scales); *sensory integrative functioning* (as measured by the DeGangi-Berk Test of Sensory Integration and the therapists' observations); and *behavior, attention, and play* (as measured by the therapists' observations).

What did the researchers find?

There were no order effects for the two interventions.

Under structured therapy, all the children made **significant** (see *Glossary*) progress in number of months gained in gross motor skills and functional skills. Also, in sensory integrative skills, there was an overall gain of 70% under structured therapy, versus 56% under child-centered activity.

In behavior, attention, and play, 4 children responded better to child-centered therapy, and 3 to structured therapy. Another 4 responded equally well to both interventions. One subject did not have any behavioral difficulties.

Examining whether there were commonalities among the children who responded better to one intervention than to the other, the researchers found no differences by intervention for children with difficult temperament, children with attention deficits, children with high family stress, children who had received treatment before, and children with moderate to severe sensorimotor problems. Child-centered therapy was better in helping behavior, attention, and play for children with low family stress, children with easy temperament, children who had just begun treatment, children with no attention difficulties, and children with mild sensorimotor problems.

What do the findings mean?

- The findings support motor learning that emphasizes the importance of developing motor programs through practice and directed feedback. Structured therapy was more useful than child-centered therapy in promoting gross motor skills, functional skills, and sensory integrative skills.
- Child-initiated sensorimotor exploration had a positive impact on behavior, attention, and play for certain children.
- The findings should boost confidence in funding structured therapy to promote gross motor skills and functional skills. The findings also suggest a productive direction for research—for example, replication of the study with larger samples.

What are the study's limitations?

- Method of subject recruitment is unknown.
- Small sample size. How size was determined is unknown.
- No **control group** (see *Glossary*) that did not receive treatment (maturation).
- Cohort dates unknown.
- Ten males, 2 females; all White.
- One metropolitan area; one treatment center involved.
- Reliability of assessors not stated.

Glossary

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

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.

■ 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 L. Diane Parham, PhD, OTR, FAOTA, and Nancy Bagatell, MA, OTR, with contributions from Christine R. Berg, PhD, OTR/L, and Patricia D. LaVesser, PhD, OTR/L.

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.



Copyright 2004 American Occupational Therapy Association, Inc. All rights reserved.

This material may be reproduced and distributed without prior written consent.