



# AOTA Evidence Briefs

## Autism Spectrum Disorder

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

### Problem Behavior Interventions for Young Children with Autism

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Horner, R., Carr, E., Strain, P., Todd, A., & Reed, H. (2002). Problem behavior interventions for young children. *Journal of Autism and Developmental Disorders*, 32(5), 423–446.

#### Level I

Systematic review

#### Why research this topic?

Children with **autism** (see *Glossary*) are at risk to develop problem behaviors. Problem behaviors observed with autism include physical aggression, self-injury, property destruction, **pica** (see *Glossary*), **stereotypy** (see *Glossary*), and tantrums. These behaviors can be highly disruptive to classroom, community, and home environments. Problem behaviors are reinforced by the disruption they create and, without intervention, they are more likely to increase than improve.

These researchers completed a Level I systematic review because they were cognizant that standards for behavioral interventions had changed and the specific effects of behavioral interventions with young children were not known. New standards for practice include preventive measures as well as reactive interventions. Preventive measures are based on functional behavioral assessment to determine (a) the antecedent events that lead to a problem behavior, (b) the consequences of problem behaviors that are reinforcing, and (c) the context for the consequences. Current comprehensive programs use functional behavioral assessment and apply individualized interventions that are consistently applied throughout the day. An understanding of the effectiveness of these comprehensive programs based on the empirical evidence is needed.

#### What did the researchers do?

This Level I systematic review involved two separate research syntheses. In the first synthesis, Horner et al. identified nine published reviews of interventions for problem behaviors. Of these nine, five reviews met the authors' criteria for inclusion in their review; that is, the participants were younger than 8 years of age and had autism, and the review examined intervention effects on problem behaviors. In the second synthesis, the authors located and analyzed peer-reviewed publications from 1996 to 2000 reporting research of interventions for problem behaviors in young children with autism. Horner et al. identified nine studies and assessed their

demographics, assessment practices, intervention procedures, research design integrity, and outcome measures. The emphasis of both reviews was to identify and describe the different types of interventions that have been applied to prevent or remediate behavior problems and the major findings about their effects.

### **What did the researcher find?**

The researchers identified eight interventions used to reduce problem behaviors in children with autism. These behavioral and educational interventions involved change of environmental stimuli, instruction, extinction, reinforcement, or punishment. Other interventions included pharmacology and systems change. Often these interventions were combined. Important themes identified across the review papers were that behavioral interventions were effective in reducing problem behaviors, that functional behavioral assessment increases the likelihood of intervention success, that interventions implemented in natural environments are more effective than interventions in nonnatural settings (e.g., hospitals), and that systems change (i.e., creating an environment structured to consistently respond to the child's behavior) increases the likelihood that the intervention will succeed.

The findings of the nine studies, published from 1996 to 2000, complemented the conclusions of the review papers. These studies targeted tantrums, aggression, stereotypy, and self-injury. The majority of studies (67%) used functional behavioral assessment. All applied behavioral interventions, most using multiple techniques that included stimulus-reinforcement, instruction, extinction, and punishment. In 62% of the comparisons, interventions were applied in the natural environment (e.g., home or school).

Across all comparisons within the studies, the average reduction of problem behaviors was 85%. Almost 60% of the comparisons demonstrated a reduction of at least 90% of the problem behaviors. Six of the nine studies showed that the reduction was fairly well maintained (within 15% of posttest level) when assessed an average of 12 weeks after the intervention.

In summary, the authors concluded that most studies of problem behaviors in young children with autism focus on aggression, disruptive behaviors, tantrums, self-injury, and stereotypy. Behavioral interventions, particularly positive behavioral interventions, are effective in reducing problem behaviors by 80% to 90%. Interventions based on functional behavioral assessment appear to be most effective in reducing problem behaviors.

### **What do the results mean?**

Based on this review, the authors identified the aspects of intervention that appear to be most beneficial and effective in reducing problem behaviors. Problem behaviors are prevented when aversive events are minimized and children are given access to rewarding activities and outcomes. When environments promote the child's engagement, give access to preferred activities, include consistent scheduling, provide access to typical peers, and include effective communication systems, problem behaviors are prevented.

Critical elements of effective intervention were identified and have important implications for occupational therapists. Intervention for children with behavioral problems should begin by using functional behavioral assessment to operationally define the problem behaviors. Through

this assessment, the antecedent events that lead to the behavior and the contingent events that maintain the behavior can be identified. Effective behavioral interventions limit the child's access to aversive events and give access to preferred events, teach socially appropriate behaviors, organize consequences to prevent reinforcement of problem behavior, and reward appropriate behaviors. Effective interventions emphasize education of the persons around the child who will implement the program and data collection to monitor the intervention effects.

### **What are the strengths and limitations of this study?**

This synthesized review realizes a comprehensive, in-depth examination of the effectiveness of interventions to reduce problem behaviors in young children with autism. Although the researchers were not occupational therapists, the concepts and strategies can be embedded in occupational therapy interventions. Most of the studies reviewed used **single-subject design** (see *Glossary*), which allowed for an in-depth analysis of each child, application of individualized intervention, and testing of its specific effect; however, single-subject design limits generalizability. By combining the five reviews and nine studies, the authors have strengthened their findings. A potential bias of the review is that the authors, Horner, Carr, Strain, Todd, and Reed, are known proponents of functional behavioral assessment and positive behavioral supports; therefore, they may have introduced some **bias** (see *Glossary*) into the overwhelmingly positive support that that study gives to those methods.

## Glossary

**Autism—Autism Spectrum Disorder—Pervasive Developmental Disorders (PDD)** is the diagnosis used in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.), text revision (DSM-IV-TR; American Psychiatric Association [APA], 2000), and in the International Classification of Diseases (ICD-10; World Health Organization, 1993) to describe children with a cluster of symptoms that vary widely in type and severity. The symptoms are grouped into three broad categories: (a) qualitative impairment in social interaction; (b) communication disorders; and (c) stereotyped, repetitive patterns of behaviors or a restricted range of interests. Depending on the level and distribution of impairment across these categories, a child can be diagnosed with Autistic Disorder, Asperger syndrome, or Pervasive Developmental Disorder—Not Otherwise Specified (PDD—NOS). All three of these diagnoses are usually included under the umbrella term *autism spectrum disorders* (ASDs).

The Individuals with Disabilities Education Improvement Act of 2004 (IDEA, Pub. L. 108-446) also includes autism as a disability category under which children might be eligible for special education and related services. The IDEA regulations define *autism* as “a developmental disability significantly affecting verbal and nonverbal communication and social interaction generally evident before age 3 that adversely affects a child’s educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences” (34 C.F.R., §300.7[c][1][i]).

**Biased/biases**— Biases are systematic errors within a study. When a study is biased, the means of treatment and/or control groups are artificially inflated or reduced. This artificial inflation or reduction can cause the study’s results to be incorrect; the treatment will appear to have an effect, when in reality it does not, or vice versa. Many of the limitations reported in these evidence briefs are related to biases.

**Pica**—Pica is an appetite for nonnutritive substances (e.g., coal, soil, chalk, paper, etc.) or an abnormal appetite for some things that may be considered foods, such as food ingredients (e.g., flour, raw potato, starch). For these actions to be considered pica, they must persist for more than 1 month, at an age where eating such objects is considered developmentally inappropriate.

**Single-subject design**—Single-subject/case research involves one client, or a number of clients, followed over time or evaluated on outcomes of interest. The basic feature of any single-subject design is the evaluation of clients for the outcome(s) of interest both before (baseline) and after the intervention. This design allows an individual to serve as his or her own “control.” However, it is difficult to conclude that the intervention alone resulted in any differences, because other factors may change over time (e.g., the disease severity may change).

**Stereotypy**—Stereotypy or self-stimulatory behavior refers to repetitive body movements or repetitive movement of objects. This behavior is common in many individuals with developmental disabilities; however, it appears to be more common in autism. Stereotypy can involve any one or all senses. Some examples of stereotypy are: staring at lights, repetitive blinking, moving fingers in front of the eyes, and hand-flapping.

## References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.—Text Revision). Washington, DC: Author.

Individuals with Disabilities Education Improvement Act (IDEA) of 2004. Public Law 108-446, 20 U.S.C.

World Health Organization. (1993). *International classification of diseases: Diagnostic criteria for research* (10th ed.). Geneva, Switzerland: World Health Organization.

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For more information about the Evidence-Based Literature Review Project, contact the Practice Department at the American Occupational Therapy Association, 301-852-6611, x 2040.



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