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Object lessons: How children with autism spectrum disorders use objects to interact with the physical and social environments

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ABSTRACT

Most of the literature on young children with autism spectrum disorders (ASDs) has emphasized their interactions with people, as opposed to objects. An assessment instrument designed to describe object interaction skills in nonverbal children with severe disabilities, *Hands-On Learning* [Rowland, C., & Schweigert, P. D. (2003). *Hands-On Learning at Home/School*. Portland, OR: Oregon Health & Science University] was administered to 2–5-year-old children with ASD by their teachers and parents and to 1–5-year-old children without disabilities by their parents. The instrument includes four strands: Ways to Obtain Objects, Practical Uses of Objects, Representational Uses of Objects and Social Uses of Objects. Parent and teacher assessments showed high levels of agreement. Children with ASD scored significantly lower than age peers on all four strands of the instrument, with lowest performance and greatest discrepancies on representational and social uses of objects. Despite these delays, acquisition of the object interaction skills investigated follows a similar course for both groups of children.

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Although some early research suggested striking anomalies in the toy play of children with autism spectrum disorder (ASD) (e.g. Tilton & Ottinger, 1964), abnormalities related to object relationships in ASD initially were not accorded diagnostic value. Now, however, the criteria in the *Diagnostic and statistical manual of mental disorders* (4th ed., text revision) include “restrictive repetitive and

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stereotyped patterns of behavior, interests and activities” (American Psychiatric Association, 2000). Nonetheless, the bulk of research and intervention efforts involving children with ASD has addressed social/communicative interactions with peers and adults. The research reported here addresses the object interaction skills that young children with ASD use as they negotiate the physical and social environments.

1. The physical environment, object interaction skills and play

Negotiating the physical environment involves initiating actions on objects, materials, equipment, and spaces and responding appropriately to the opportunities, problems and demands that they pose. Children’s interactions with the physical environment reflect their understanding of the physical world and how to use it to achieve their own ends, be those social or nonsocial in nature. Object interaction skills involve not only the physical manipulation of objects, but also an understanding of the uses of objects, of ways to gain access to desired objects, of the relationships between objects, and of relationships between the self and objects. The object relationships of typical young children, most often revealed in their toy play, serve an important role in both cognitive and social skill development. In the words of [Toth, Munson, Meltzoff, and Dawson \(2006\)](#) “. . . through toy play and imitation, the child not only comes to an understanding of the world around him—what people do and think and how objects work—but also has the opportunity to demonstrate that understanding” (p. 1001). The primary context for examining the development of early object interaction skills is play. Longitudinal studies show a developmental sequence of broad categories of object relationships in children’s play over time, progressing from play involving single objects to play involving the combination of two or more objects, from undifferentiated sensorimotor actions to more controlled, coordinated play guided by the unique properties of objects, and finally to increasingly sophisticated symbolic play schemes (for reviews see [Casby, 2003](#) and [Rogers, Cook, & Meryl, 2005](#)).

2. Object interactions of children with ASD

A number of studies addressing the object interaction skills of children with ASD have focused on specific Piagetian tasks, such as sorting and classification; many of these studies suggest that children with ASD experience difficulties with specific aspects of such tasks (e.g. [Shulman, Yirmiya, & Greenbaum, 1995](#)). In sharp contrast to the Piagetian studies are those that paint a picture of object interaction using the broad brush strokes of major categories of play. These studies of object play have focused on three categories: sensorimotor, functional and symbolic play and the relative preponderance of these forms. The earliest form of play, sensorimotor play, is closely tied to the senses and movement. Functional play involves the use of objects in accordance with their conventional purposes. Symbolic play involves substituting one object for another object or person, or pretending to be another person or an object.

Since ASD is often not diagnosed prior to two years of age, little is known about early object play ([Watson, Baranek, & DiLavore, 2003](#)). A retrospective study of home movies suggested that excessive mouthing of objects was present in the first year that distinguished children with ASD from typically developing (TD) children ([Banarek, 1999](#)). [Richler, Bishop, Kleinke, and Lord \(2007\)](#) found more repetitive use of objects in 2-year olds with ASD as compared to TD children. [Zwaigenbaum et al. \(2005\)](#) were able to relate the status of some sensorimotor skills (visual tracking, disengagement of visual attention and sensory oriented behaviors) at 12 months to 24-month diagnostic outcomes for children who were at high risk for ASD as the younger siblings of children with autism. [Dominguez, Ziviani, and Rodger \(2006\)](#) observed more relational play (combining objects in nonfunctional and nonsymbolic ways), sensorimotor play and exploratory play behaviors in 3–7-year olds with ASD as compared to TD children. [Libby, Powell, Messer, and Jordan \(1998\)](#) found more sensorimotor play in the spontaneous object play of 5–16-year olds with ASD as compared to TD 1–2-year olds. Overall, children with ASD are more likely to use proximal senses to explore than vision, to become preoccupied with parts of objects, and to persist in undifferentiated manipulation of objects longer than expected in their sensorimotor play ([Williams, 2003](#)).

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