

# Assessing visual attention in young children and adolescents with severe mental retardation utilizing conditional-discrimination tasks and multiple testing procedures

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## Abstract

To effectively reduce overselective attention, a fine-grained analysis of the control exhibited by compound training cues is first needed. Computer software was developed in this study to administer two different stimulus control-testing procedures to assess how three young children of normal development and three adolescents with severe mental retardation attended to stimulus compounds when conditional-discrimination tasks were provided. One test assessed stimulus control by determining response accuracy for each component of the S+ compounds. The other testing procedure measured the response topographies of the compound stimuli using a touch screen attached to a computer monitor screen. After pretraining each stimulus component, all three children attended simultaneously to two elements in a conditional-discrimination task with few errors occurring. The adolescents with mental retardation eventually attended to both elements simultaneously but required more pretraining and exposure to the conditional-discrimination tasks before simultaneous attention occurred. Since the adolescents with severe mental retardation learned to simultaneously attend to multiple cues in the conditional-discrimination tasks, this demonstrated that restricted attention is not an unmodifiable perceptual characteristic among individuals with developmental disabilities. Recording response topographies with a touch screen was also discovered to be a sensitive measure of stimulus preferences for both groups. Utilizing touch-screen technology may prove to be critical for accurately identifying stimulus preferences and

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contribute to the understanding and treatment of overselective attention in students with attentional deficits.

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## 1. Introduction

The intent of this investigation was to utilize computer touch-screen technology for assessing visual attention. The specific computer instructional program involved procedures which determined how young children of normal development and adolescents with severe mental retardation, both groups having comparable mental age, attended to compound visual cues when conditional-discrimination tasks were provided. This kind of assessment is important because it can reveal perceptual abnormalities that prevent or delay acquisition of essential skills. One type of attentional deficit, for example, that can interfere with a child's development is overselective attention in which the child attends only to restricted portions of complex stimulus displays. Children with overselective visual attention demonstrate a type of "tunnel vision" in which they attend to only a limited number of elements in a visual compound. Overselective attention has been reported in students with developmental disabilities (Bailey, 1981; Koegel & Wilhelm, 1973; Lovaas & Schreibman, 1971; Lovaas, Schreibman, Koegel, & Rehm, 1971; Rincover & Ducharme, 1987; Schreibman & Lovaas, 1973; Schreibman, Kohlenberg, & Britten, 1986; Stromer, McIlvane, Dube, & Mackay, 1993; Ullman, 1974; Whiteley, Zaparniuk, & Asmundson, 1987; Wilhelm & Lovaas, 1976), and this attentional deficit can be very extreme among individuals with autism and severe levels of mental retardation (Rincover & Ducharme, 1987; Whiteley et al., 1987; Wilhelm & Lovaas, 1976). Stimulus overselectivity may explain the difficulty in acquiring appropriate social, language, play, and emotional behaviors commonly demonstrated by children with developmental disabilities (Burke, 1991; Dunlap, Koegel, & Burke, 1981).

The current study used conditional-discrimination tasks requiring simultaneous attention to multiple cues to assess the presence of overselective attention in young children of normal development and adolescents with severe mental retardation. The stimulus compounds were composed of letters and symbols, and conditional-discrimination tasks were presented, which required simultaneous attention to two elements of the training compounds to maintain continuous reinforcement. An advantage of using a conditional-discrimination paradigm requiring simultaneous attention to multiple cues is that it tests directly whether or not overselective attention is evident. Since responding to only one component would produce errors and prevent the student from achieving continuous reinforcement, selective attention is immediately revealed. In contrast, tests which consist of presenting individual components alone after the acquisition of compound discriminations can only infer attentional patterns produced by the

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