

Longitudinal Follow-Up of Children With Autism Receiving Targeted Interventions on Joint Attention and Play

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Objective: This study examines the cognitive and language outcomes of children with an autism spectrum disorder (ASD) over a 5-year period after receiving targeted early interventions that focused on joint attention and play skills. **Method:** Forty children from the original study ($n = 58$) had complete data at the 5-year follow-up. **Results:** In all, 80% of children had achieved functional use of spoken language with baseline play level predicting spoken language at the 5-year follow-up. Of children who were using spoken language at age 8 years, several baseline behaviors predicted their later ability, including earlier age of entry into the study, initiating joint attention skill, play level, and assignment to either the joint attention or symbolic play intervention group. Only baseline play diversity predicted cognitive scores at age 8 years. **Conclusions:** This study is one of the only long-term follow-up studies of children who participated in preschool early interventions aimed at targeting core developmental difficulties. The study findings suggest that focusing on joint attention and play skills in comprehensive treatment models is important for long-term spoken language outcomes. *J. Am. Acad. Child Adolesc. Psychiatry*, 2012;51(5):487–495. **Key Words:** autism, intervention, joint attention, symbolic play, language

Young children with autism spectrum disorders (ASD) are noted for a constellation of developmental difficulties that differentiate them from other children.^{1,2} These early difficulties center primarily on social and communication skills, such as joint attention, imitation, affective sharing, and object play skills. Longitudinal studies document the importance of these early skills to later developmental outcomes and particularly spoken language, a core developmental problem of autism.^{1,3} Several examples include the following: motor imitation skills at age 2 years led to greater language at age 4 years, initiating joint attention at age 2 was associated with better language outcomes at age 5 years^{4,5}; and re-

sponding to joint attention at age 3 to 5 years predicted better language outcomes 1 year later³ and 8 years later.⁶ Theoretically, these early skills may affect language outcome because they require a shared focus of attention that enables the child to acquire the types of skills that are socially learned, such as language.^{7,8}

Perhaps the greatest goal of early intervention for children with autism is to gain functional spoken language by entry into school at age 5 years. Indeed, acquiring spoken language before age 5 has been heralded as the single most important achievement leading to the best social outcomes of children with autism.^{9–12} Thus one approach to improving spoken language outcomes is to target the prelinguistic skills that develop before the onset of spoken words (e.g., gestures used for sharing attention with another about an event or common interest) and that are impaired in children with autism.^{13,14} These gestures include pointing to share, showing an ob-



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ject, and coordinating looks between people and objects.

There is ample evidence that these early skills are important to later spoken language outcomes in children with autism and that they should be teaching targets for early intervention programs.^{1,15} Over the past 10 years, comprehensive early intervention programs have focused greater effort on improving joint attention, imitation, and play skills in young children.^{16,17} We also have amassed a great deal of evidence of the effectiveness of comprehensive early interventions on the developmental outcomes of children with ASD when interventions are delivered with intensity, at least 20 hours per week for several years.¹⁸ However, because early skills in joint attention and play are rarely assessed before and after intervention, we have little information on how they might change with specific interventions, and whether changes in these skills account for improvements in developmental outcomes. In general, greater change is identified in cognitive developmental domains compared to spoken language, with language outcomes requiring longer durations of intervention.¹⁸ For example, in two randomized controlled experiments examining outcomes of comprehensive intervention, spoken language standard scores significantly improved only after 2 years of intensive treatment in one study¹⁹ and were non-significant in the other.²⁰

An issue is whether interventions that directly target joint attention might yield better language outcomes.²¹ Recent studies that have directly taught these early skills have had mixed results. The reasons for these inconsistent findings may relate to the intensity in which the intervention was delivered and/or the method of delivery. For example, two studies implemented a parent education model in which there was only a small amount of direct intervention with children. One study found significant change in children's social communication skills when the intervention was delivered over 12 months,²² but neither study found significant main effects on language outcomes for the experimental intervention compared to a no-treatment control group.^{22,23} Thus, whether the intervention comprised 11 sessions of intervention over 3.5 months²³ or 18 sessions over 1 year,²² findings were similar and may relate to the minimal direct intervention with children (as opposed to parents), or to the low intensity of the intervention in general. Most

children participated in additional community interventions, with nonsignificant differences across groups. Similarly, in a toddler classroom study, overall improvements in cognition and language were noted for children in two classrooms, one in which joint attention and imitation were infused into the curriculum, and one in which this focus was not included.²⁴ Compared to children in the control classroom, the children in the experimental classroom showed significantly better imitation skills at the end of treatment. No other group main effects were noted at the end of treatment or in cognitive and language outcomes 6 months later.

Changes in language development may come about with a certain level of intensity of intervention, as well as targeted focus on the content of the interventions. For example, significant effects on joint attention skills were found in a study in which focused content on joint attention was delivered by skilled interventionists for 30 minutes daily over an average of 6 weeks and layered into an intensive early intervention program of 30 hours per week.²⁵ This randomized controlled study also included a targeted play intervention and a control group receiving only the standard preschool program. Not only did joint attention skills improve relative to the control group, but children also demonstrated significantly greater spoken language scores 1 year after the end of intervention.²⁶ In this study, children receiving the play intervention also demonstrated significantly improved language scores 1 year later, suggesting that the joint attention and play interventions had a common mechanism of joint engagement between adult and child affecting language. Theoretically, joint engagement serves as a platform for the continued development of social, communication, and language skills over time.

These data suggest there are benefits to focused content on joint attention and play skills in early intervention programs of sufficient intensity. Furthermore, language outcomes improved at least 1 year post intervention. However, to date we have limited data on the long-term effects of children's early intervention experiences. Indeed, most rigorously tested (randomized controlled) early intervention studies report limited or no follow-up data.^{19,20} One example of a long-term follow-up of early intervention was reported recently. This 7-year follow-up study was noncontrolled/nonexperimental; children

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