

## Communication

The following articles were selected from a search of over 40 articles using the search terms (1) communication and autism and preschoolers, (2) communication and autism and infants, (3) wetherby and communication and infants, and (4) Goldstein and communication and autism. Databases searched were CINAHL Plus with Full Text, Pre-CINAHL, PsycINFO, PsycARTICLES, PsycEXTRA, and ERIC. This search was limited by time and does not represent all of the research available on the broad topic of communication and autism.

### Literature Review

Goldstein, H. (2002). Communication intervention for children with autism: A review of treatment efficacy. *Journal of Autism and Developmental Disorders*, 32(5), 373-396.

Abstract: Seventeen empirical studies evaluating speech and language intervention procedures applied to children with autism are reviewed, and the documented benefits are summarized. In particular, interventions incorporating sign language, discrete-trial training, and milieu teaching procedures have been used successfully to expand the communication repertoires of children with autism. Other important developments in the field stem from interventions designed to replace challenging behaviors and to promote social and scripted interactions. The few studies of the parent and classroom training studies that included language measures also are analyzed. This article seeks to outline the extent to which previous research has helped identify a compendium of effective instructional practices that can guide clinical practice. It also seeks to highlight needs for further research to refine and extend current treatment approaches and to investigate more comprehensive treatment packages.

### Individual Studies

Sullivan, M., Finelli, J., Marvin, A. Garrett-Mayer, E., Bauman, M., & Landa, R. (2007). Response to joint attention in toddlers at risk for autism spectrum disorder: A prospective study. *Journal of Autism and Developmental Disorders*, 37(1), 37-48.

Abstract: Response to joint attention (RJA) is impaired in preschoolers with autism spectrum disorder (ASD) and is pivotal to social and communication development. Response to joint attention was examined at 14 and 24 months in 51 children at high risk for autism (siblings of children with autism). Outcome groups at age 3 years included ASD (n = 16), broader autism phenotype (n = 8), and non-broader autism phenotype (n = 27). The ASD group made minimal improvement in RJA between 14 and 24 months, but stability of RJA across tasks increased for all three groups. Significantly, lower RJA was observed for the ASD group at 24 months. Response to joint attention performance at 14 months predicted ASD outcome. Response to joint attention is an important screening and early intervention target.

Yoder, P., & Stone, W.L. (2007). A randomized comparison of the effect of two prelinguistic communication interventions on the acquisition of spoken communication in preschoolers with ASD. *Journal of Speech, Language & Hearing Research*, 49(4): 698-711.

Abstract: PURPOSE: This randomized group experiment compared the efficacy of 2 communication interventions (Responsive Education and Prelinguistic Milieu Teaching [RPMT] and the Picture Exchange Communication System [PECS]) on spoken communication in 36 preschoolers with autism spectrum disorders (ASD). METHOD: Each treatment was delivered to children for a maximum total of 24 hr over a 6-month period. Spoken communication was assessed in a rigorous test of

generalization at pretreatment, posttreatment, and 6-month follow-up periods. RESULTS: PECS was more successful than RPMT in increasing the number of nonimitative spoken communication acts and the number of different nonimitative words used at the posttreatment period. Considering growth over all 3 measurement periods, an exploratory analysis showed that growth rate of the number of different nonimitative words was faster in the PECS group than in the RPMT group for children who began treatment with relatively high object exploration. In contrast, analogous slopes were steeper in the RPMT group than in the PECS group for children who began treatment with relatively low object exploration.

Boulware, G., Schwartz, I., Sandall, S.R., McBride, B.J. (2006). Project DATA for Toddlers: An inclusive approach to very young children With autism spectrum disorder. *Topics in Early Childhood Special Education*, 26(2), 94-105.

Abstract: Because more children under the age of 3 years are being diagnosed with autistic spectrum disorder (ASD), early interventionists face the challenge of identifying appropriate programs to meet the unique needs of very young children with ASD and their families. Project DATA (Developmentally Appropriate Treatment for Autism) for Toddlers is an inclusive early intervention program for children between 1 year and 3 years old who have been diagnosed with ASD and is based on an existing program for preschoolers with ASD at the University of Washington. Project DATA for Toddlers uses the effective preschool model and makes modifications to meet the unique developmental needs of toddlers. In this article, the authors describe the components of Project DATA for Toddlers and present preliminary findings, specifically, child outcome data from the areas of cognition, communication, self-regulation, functional skills, and elementary school placement. They also discuss the implications for early intervention service delivery programs.

Drager K.D.R., Postal V.J., Carrolus L., Castellano M., Gagliano C., & Glynn J. (2006). The effect of aided language modeling on symbol comprehension and production in 2 preschoolers with autism. *American Journal of Speech-Language Pathology*, 15(2), 112-25.

Abstract: PURPOSE: The purpose of the present study was to examine the effectiveness of an instructional procedure called aided language modeling (ALM) on symbol comprehension and expression in 2 preschool children with autism who used few words functionally. ALM consists of engaging the child in interactive play activities and providing models of use of augmentative and alternative communication symbols during play. METHOD: A multiple-baseline design across sets of symbol vocabulary was used with 2 children who had autism. Four vocabulary items were taught in each of 3 legs of the design, for each child. RESULTS: Both participants demonstrated increased symbol comprehension and elicited symbol production. In addition, both participants demonstrated that symbol comprehension and symbol production could be maintained. For both children, performance on symbol production lagged behind rate of responses on symbol comprehension. CONCLUSIONS: The current research presents preliminary evidence that a modeling intervention may be effective in increasing symbol comprehension and production, and may be an appropriate intervention strategy for some preschoolers with autism. Future research should continue to investigate this strategy and its effects on functional communication.

Kashinath, S., Woods, J., & Goldstein, H. (2006). Enhancing generalized teaching strategy use in daily routines by parents of children with autism. *Journal of Speech, Language, and Hearing Research*, 49(3), 466-485.

Abstract: Purpose: The purpose of this study was to examine the effects of facilitating generalized use of teaching strategies by parents of children with autism within daily routines. Method: Five

preschool children with autism participated in intervention with a parent within daily routines in the family's home. Parents learned to include 2 teaching strategies in target routines to address their child's communication objectives. Parent-child interactions in routines were videotaped for data coding and analysis. Proactive programming of generalization occurred by systematic selection of intervention routines and by embedding intervention in multiple routines. Generalization data were collected by measuring strategy use in untrained routines. A multiple baseline design across teaching strategies was used to assess experimental effects. Results: All parents demonstrated proficient use of teaching strategies and generalized their use across routines. The intervention had positive effects on child communication outcomes. All parents perceived the intervention to be beneficial. Conclusion: Results from this study add to the limited body of evidence supporting parent-implemented interventions in natural environments with young children with autism spectrum disorder. Additional research that replicates this approach with children of varying ages and disabilities and families with diverse characteristics is needed to support the generality of these findings.

Triesch, J., Teuscher, C., DeÁjk, G.O., & Carlson, E.(2006). Gaze following: Why (not) learn it? *Developmental Science*,9(2), 125-147.

Abstract: We propose a computational model of the emergence of gaze following skills in infant-caregiver interactions. The model is based on the idea that infants learn that monitoring their caregiver's direction of gaze allows them to predict the locations of interesting objects or events in their environment (Moore & Corkum, 1994). Elaborating on this theory, we demonstrate that a specific Basic Set of structures and mechanisms is sufficient for gaze following to emerge. This Basic Set includes the infant's perceptual skills and preferences, habituation and reward-driven learning, and a structured social environment featuring a caregiver who lends to look at things the infant will find interesting. We review evidence that all elements of the Basic Set are established well before the relevant gaze following skills emerge. We evaluate the model in a series of simulations and show that it can account for typical development. We also demonstrate that plausible alterations of model parameters, motivated by findings on two different developmental disorders--autism and Williams syndrome--produce delays or deficits in the emergence of gaze following. The model makes a number of testable predictions. In addition, it opens a new perspective for theorizing about cross-species differences in gaze following.

Landa, R. (2005). Assessment of social communication skills in preschoolers. *Mental Retardation and Developmental Disabilities Research Reviews*,11(3), 247-252.

Abstract: This paper orients the reader to social communication assessment and reviews methods for assessing social communication behavior in children from toddlerhood through the preschool years. Most standardized, normed tests of language in this age range focus on morpho-syntactic and semantic comprehension and production abilities. While social communication is perhaps one of the most important skills for peer acceptance, these skills are often overlooked in language evaluation with children. However, there are a number of caregiver questionnaires, interviews, or direct social-communication sampling methods that are available to assist clinicians or researchers in documenting social-communication skills or behaviors. Since assessment of social communication is essential in clinical work with children with an autism spectrum disorder, some of the tools described below are outgrowths of autism research or provide autism-related scores. While many children receiving social communication assessments do not have autism, the need to assess social communication skills in children with language impairment is highlighted by the growing literature documenting social and pragmatic difficulties in this population

Wetherby, A.M., Woods, J., Allen, L., Cleary, J., Dickinson, H., Lord, C. (2004). Early indicators of autism spectrum disorders in the second year of life. *Journal of Autism and Developmental Disorders*, 34(5), 473-493.

Abstract: Three groups of 18 children were selected for this study, one group with autism spectrum disorders (ASD), one group with developmental delays in which ASD was ruled out (DD), and one group with typical development (TD), from a pool of 3026 children who were screened with the Communication and Symbolic Behavior Scales Developmental Profile (CSBS DP, Wetherby & Prizant, 2002) Infant-Toddler Checklist under 24 months of age. The CSBS DP Behavior Sample was videotaped on selected children as a second-level evaluation during the second year of life. The Infant-Toddler Checklist had a sensitivity and specificity of 88.9% for this sample of children. Significant group differences were found on the Infant-Toddler Checklist and the Behavior Sample, However, these differences did not distinguish children with ASD and DD with high accuracy. The videotapes of the Behavior Sample were reanalyzed to identify red flags of ASD. Nine red flags differentiated children in the ASD group from both the DD and TD groups and four red flags differentiated children in the ASD Group from the TD group but not the DD group. These 13 red flags were found to discriminate the three groups with a correct

Woods, J., Kashinath, S., & Goldstein, H., (2004). Effects of embedding caregiver-implemented teaching strategies in daily routines on children's communication outcomes. *Journal of Early Intervention*, 26(3), 175-193.

Abstract: Effects of instructing caregivers to implement teaching strategies within daily routines were investigated using a multiple baseline design across caregiver strategies and participants. Four toddlers with developmental delays participated in intervention conducted by their primary caregiver within the family's preferred play routines. To assess generalization, caregiver teaching strategy use was observed during other caregiving and outdoor play routines. Caregiver strategy use increased subsequent to instruction within indoor play routines. Generalization to other routines, however, was limited in three of the four dyads. All four children demonstrated gains in communication objectives and test scores across multiple developmental domains improved. This study demonstrates the viability of teaching caregivers to embed effective teaching strategies within daily routine to improve the communication skills of toddlers

Charman, T., Baron-Cohen, S., Swettenham, J., Baird G., Drew, A., & Cox, A. (2003). Predicting language outcome in infants with autism and pervasive development disorder. *International Journal of Language & Communication Disorders*, 38(3), 265-85.

Abstract: BACKGROUND: To examine longitudinal associations between diagnosis, joint attention, play and imitation abilities and language outcome in infants with autism and pervasive developmental disorder. METHODS AND PROCEDURES: Experimental measures of joint attention, play and imitation were conducted with a sample of infants with autism spectrum disorder at age 20 months. Language outcome was assessed at age 42 months. A within-group longitudinal correlational design was adopted. OUTCOMES AND RESULTS: Language at 42 months was higher for children with a diagnosis of pervasive developmental disorder than for children with a diagnosis of autism. Language at follow-up was also positively associated with performance on experimental measures of joint attention and imitation, but not with performance on experimental measures of play and 'goal detection' at 20 months, nor with a non-verbal intelligence quotient, although these associations were not examined independent of diagnosis. However, floor effects on the measure of play at 20 months and the small sample size limit the conclusions that can be drawn. CONCLUSIONS: Individual differences in infant social-communication abilities as well as diagnosis may predict language outcome in preschoolers with autism spectrum disorders. Attention should be directed at assessing

these skills in 2- and 3-year-old children referred for a diagnosis of autism spectrum disorder. Imitation and joint attention abilities may be important targets for early intervention.

Koppenhaver, D.A., & Erickson, K.A. (2003). Natural emergent literacy supports for preschoolers with autism and severe communication impairments. *Topics in Language Disorders*, 23(4), 283-92, 344-50.

Abstract: Print materials, experiences, and writing technologies were introduced into a preschool classroom for children with autism spectrum disorders, including three 3-year-olds with severe communication impairments. The goal was to increase natural literacy learning opportunities and to explore the effects on children's emergent literacy behaviors and understandings. Findings suggest that the children found the materials and experiences interesting and that their understanding and use of print materials and tools increased in sophistication.

Woods, J.J., & Wetherby, A.M., (2003). Early identification of and intervention for infants and toddlers who are at risk for autism spectrum disorder. *Language, Speech, and Hearing Services in Schools*, 34(3), 180-193.

Abstract: Providing intensive early intervention is critical to maximizing outcomes for children with autism spectrum disorder (ASD), and evidence suggests that the earlier intervention can begin, the better the outcome. The first purpose of this article is to review the earliest indicators of ASD in very young children--social and communication impairments--which have important implications for early identification. The second purpose is to review evidence-based intervention practices for children with ASD and to develop a set of guiding principles for providing intervention for infants and toddlers who are at risk for ASD. Issues that are delineated include providing intervention in natural environments, supporting families in early intervention, and embedding intervention in daily routines.

## Resources on the Web

Vicker, B. (2004). *Selected bibliography: Communication literature related to autism spectrum disorders*. Bloomington, IN: Indiana Resource Center for Autism. Retrieved January 10, 2008 from <http://www.iidc.indiana.edu/irca/communication/bibLit.html>.