NARIC
National Rehabilitation Information Center

reSearch

A collection of research reviews on rehabilitation topics from NARIC and other information resources.

Volume 5, Issue 1, January 2010

Autism Spectrum Disorders & Augmentative and Alternative Communication

In this edition of *reSearch* we explore the use of augmentative and alternative communication with individuals with autism spectrum disorders. Augmentative and alternative communication (herein referred to as AAC) "... includes all forms of communication (other than oral speech) that are used to express thoughts, needs, wants, and ideas" (Retrieved January 21, 2010 from http://www.asha.org/public/speech/disorders/AAC). This is especially important for individuals with autism spectrum disorders (herein referred to as ASD). According to the American Speech-Language-Hearing Association (ASHA) AAC is used to as a supplement to existing speech or to replace speech that is not functional. There are two types of communication systems: *unaided* and *aided*. *Unaided communication systems* rely on the user's body to convey messages through gestures, body language, and/or sign language. *Aided communication systems* involve the use of equipment in addition to the user's body. Examples include: pen and paper, communication books or boards, and voice output devices (speech degenerated devices or written output). These electronic communication aids allow users to express themselves by using pictures, symbols, letters, and/or words and phrases to convey messages. AAC can increase social interaction, academic performance, and self-esteem.

This edition of *reSearch* provides a "snapshot" of research on AAC as it relates to ASD over a 10 year period. Whenever possible, NARIC attempts to utilize and incorporate relevant citations from alternative databases within *reSearch*. In this edition, information specialists incorporated citations from the Evidence in Augmentative and Alternative Communication (EVIDAAC) database. EVIDAAC is a free database of appraised research evidence related to interventions in AAC. Funded by NIDRR, EVIDAAC is grounded in the intersections of AAC, disability and rehabilitation, evidence-based practice, knowledge translation, health communication, and e-health. The EVIDAAC database catalogs the following types of research evidence: systematic reviews, meta-analyses, narrative reviews, randomized control trials, non-randomized trials, case series, single-subject experimental design and comparative single subject experimental designs. (Retrieved January 21, 2010 from http://www.evidaac.com).

Combined search terms for this edition of *reSearch* included: Augmentative and Alternative Communication, AAC, Autism, Autism Spectrum Disorders, ASD, and Communication Strategies. A listing of approximately 100 additional descriptor terms between the NARIC, ERIC, EVIDAAC, and PubMed databases can be found at the end of this document. A search of the REHABDATA database resulted in 20 documents published between 2000 and 2008. The ERIC database resulted in 12 documents between 2000 and 2009. Finally the PubMed and EVIDAAC database searches resulted in two documents from 2004 and 2006, and four documents from 1997 through 2007 respectively. The number of PubMed citations would have been higher if not for the duplicate search results of the other databases. The complete citations are included in this research brief.

Citations:

American Speech-Language-Hearing Association (ASHA). **Augmentative and Alternative Communication (AAC).** Retrieved from http://www.asha.org/public/speech/disorders/AAC.

Blackstone, S., Dowden, P., Eysenbach, G., Raghavendra, P., Schlosser, R.W., & Sigafoos, J. (2007). **Evidence in Augmentative and Alternative Communication.** Retrieved from http://www.evidaac.com.

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NIDRR Funded Projects Related to Autism Spectrum Disorders & AAC

In addition to document searches, we searched our NIDRR Program Database to locate grantees/projects related ASD and AAC. The search resulted in 4 NIDRR funded projects — 4 currently funded and 12 which have completed their research activities. Project information and their publications are offered as additional resources for our patrons.

EVIDAAC: A Database of Appraised Evidence in Augmentative and Alternative Communication
Project Number: H133G070150
Phone: 617/373-3785
Email: r.schlosser@neu.edu
www.evidaac.com

Experimental Evaluation of the Online and Applied System for Intervention Skills (OASIS) Training Program Using Video-Conferencing for Parents of Children with an Autism Spectrum Disorder
Project Number: H133G090136
Phone: 913/588-5588
Email: lhpowell@ku.edu
www.jgcp.ku.edu

Rehabilitation Engineering Research Center for Communication Enhancement (AAC-RERC)
Project Number: H133E080011 (See also H133E030018)
Phone: 919/681-9983
Email: aac-rerc@mc.duke.edu
www.aac-rerc.com

Systematic Study of the Effectiveness of AAC Intervention to Improve Conversation in Individuals with Degenerative Language Disorders
Project Number: H133G080162
Phone: 503/494-2619
Email: friedm@ohsu.edu

The following projects have completed their research activities:

Advanced Prediction Methods for Augmentative Communication
Project Number: ED-98-CO-0031
Phone: 716/433-0608
Email: lesher@enkidu.net
www.enkidu.net

Do Interventions in Augmentative and Alternative Communication Really Work? A Research Synthesis
Project Number: H133F010010
Phone: 617/373-3785
Email: r.schlosser@neu.edu

Enhancing AAC Communication through Improved Access to Fringe Vocabulary Words
Project Number: H133G040051
Phone: 302/831-1956
Email: mccoy@cis.udel.edu

Functional Communication Training Using an Augmentative Communication System
Project Number: H133C90182

LITERAAC: Literacy Interventions to Enhance Reading and Writing through Augmentative and Alternative Communication
Project Number: H133G30099
Phone: 919/966-7486 (V/TTY)
Email: astaples@email.unc.edu

Oregon Project Rehabilitation of Communication Skills in Dementia through AAC
Project Number: H133G040176
Phone: 503/494-2619
Email: friedm@ohsu.edu

Playmation: A Manipulative Story Animation System to Improve Language, Theory of Mind, and Sequencing Skills in Children with Autism
Project Number: H133S060050
Phone: 301/294-5230
Email: smayhew@I-A-I.com
www.I-A-I.com

Rehabilitation Engineering Research Center in Augmentative Communication
Project Number: H133E30010
Phone: 302/651-6840 (V), 302/651-6834 (TTY)
Email: rerc-aac@asel.udel.edu
www.asel.udel.edu

Rehabilitation Engineering Research Center on Communication Enhancement
Project Number: H133E980026 (See also H133E030018)
Phone: 919/681-9983
Email: aac-rerc@mc.duke.edu
www.aac-rerc.com

Speech Production Training Agent for Children with Language Challenges
Project Number: H133S040105
Phone: 650/533-6444
Email: info@animatedspeech.com
www.animatedspeech.com

StoryTiles: Programmable Manipulatives to Improve Language, Sequencing, Theory of Mind, and Play Skills in Children with Autism
Project Number: H133S040132
Phone: 301/294-5230
Email: smayhew@i-a-i.com
www.i-a-i.com

Utilization of Communication Frames to Develop Augmentative Communication Technologies
Project Number: H133F60010
Phone: 716/884-9410

Full-text copies of these documents may be available through NARIC's document delivery service.

To order any of the documents listed, please note the NARIC Accession Number (starts with a J, O, or R) and call an information specialist at 800/346-2742.

You may also order online at www.naric.com/services/requestform.cfm. There is a charge of five cents for copying and shipping with a $5 minimum on all orders. International shipping fees may apply.

Documents from NARIC's REHABDATA search listed are listed below:

2008

Bjorck-Akesson, E., Granlund, M., Wilder, J., & Ylven, R. (2008). **AAC interventions for children in a family environment: Implementing evidence in practice.** *Augmentative and Alternative Communication, 24*(3), 207-219.
NARIC Accession Number: J55484
ABSTRACT: Article reviews the research that has focused on parents as AAC interventionists, the family as a context for AAC intervention, and the effects of AAC interventions on children and other family members. The discussion is framed within the steps associated with the process of knowledge translation, or the process of implementing evidence in practice. This involves 4 steps: (1) deciding on desired outcomes of interventions, (2) evaluating evidence of the effectiveness of different AAC methods to obtain the desired outcomes, (3) translating the research evidence into everyday practice, and (4) implementing knowledge in practice.

Cook, K.E., Ganz, J.B., Sigafoos, J., & Simpson, R.L. (2008). **Generalization of a pictorial alternative communication system across instructors and distance.** *Augmentative and Alternative Communication, 24*(2), 89-99.
NARIC Accession Number: J55081
ABSTRACT: Study examined the use of a picture exchange communication system (PECS) to promote generalization of AAC across a variety of communicative partners and situations for a 12-year-old boy with autism. The PECS is a picture-based, aided AAC system that teachers a child to exchange a picture for a desired item. Results indicated that the boy was able to generalize his communication skills across a variety of instructors and to use functional non-verbal strategies to respond to communication obstacles.

Mirenda, P. (2008). **A back door approach to autism and AAC.** *Augmentative and Alternative Communication, 24*(3), 220-234.
NARIC Accession Number: J55485
ABSTRACT: Article encourages practitioners and researchers to examine current assumptions about autism and to invent and investigate new ways to support people with autism to communicate effectively. The conventional view is that most individuals with ASD have no significant motor impairments but do have severe intellectual disabilities. These assumptions impact the nature and types of AAC interventions that are typically provided, which tend to be narrowly focused on basic, functional communication skills such as requesting. However, recent research is reviewed that provides evidence that challenges these assumptions and suggests the potential of intervention approaches targeting motor, language, and literacy development.

Tien, K.C. (2008). **Effectiveness of the picture exchange communication system as a functional communication intervention for individuals with autism spectrum disorders: A practice-based research synthesis.** *Education and Training in Developmental Disabilities, 43*(1), 61-76.
NARIC Accession Number: J54648
ABSTRACT: This synthesis of the literature verifies the effectiveness of the Picture Exchange Communication System (PECS) for enhancing the functional communication skills of individuals with ASD. Analysis focused on the degree to which variations in the PECS training are associated with variations in functional communication outcomes. The communication consequences of PECS were examined in 13 studies, which included 125 participants with ASD who had been identified as having limited or no functional communication skills. Across the studies, participants who received the PECS training experienced positive gains in functional communication skills. The available research appears to support claims that PECS is an effective intervention for improving functional communication skills.

2006

Carrolus, L., Castellano, M., Drager, K.D.R., Gagliano, C., Glynn, J., & Postal, V.J. (2006). **The effect of aided language modeling on symbol comprehension and production in two preschoolers with autism.** *American Journal of Speech-Language Pathology, 15*(2), 112-125.
NARIC Accession Number: J53145
ABSTRACT: Study examined the effectiveness of aided language modeling (ALM) on symbol comprehension and expression in two preschool children with autism. ALM consists of engaging the child in interactive play activities and providing models of use of AAC symbols during play. The ALM intervention used both graphic and verbal stimuli to teach new symbol vocabulary. Four vocabulary items were taught to each child. Both children demonstrated increased symbol comprehension and elicited symbol production and that these improvements could be maintained. The children's performance on symbol comprehension and production, as well as on graphic stimuli alone or verbal stimuli alone, is discussed.

Flis, L.D., Rinaldi, C., & Stuart, S.K. (2006). **Connecting with families: Parents speak up about preschool services for their children with autism spectrum disorders.** *Teaching Exceptional Children, 39*(1), 46-51.
NARIC Accession Number: J51393
ABSTRACT: Study examined parents' perceptions of the services offered for their preschool children with ASD. Parents were questioned about the education elements most important to them and their experiences with various therapies. The elements parents were most concerned with included school climate, communication with teachers, and knowledge level of the staff. Applied behavioral analysis, visual strategies, and social stories were three strategies used at the preschool that parents found to be highly effective.

2005

Cafiero, J.M. (2005). ***Topics in autism: Meaningful exchanges for people with autism: An introduction to augmentative and alternative communication.*** Bethesda: Woodbine House, Inc.
NARIC Accession Number: R08654
ABSTRACT: This book provides an overview of AAC for people with ASD. AAC refers to any tool, device, picture, word, symbol or gesture that compensates for expressive and receptive communication deficits. The author explains why AAC is an effective and appropriate communication option for people with ASDs. An extensive section on ACC and special education law covers eligibility and entitlement issues; how to make sure a communication system is included in an individual education program and stays with a student from school to school; and who pays for a device. Real-life vignettes illustrate how various AAC tools increase communication with others and, consequently, improve quality of life. Appendices provide additional sources of information about specific devices and software, as well as listings of manufacturers and training opportunities.

Geluso, B. (2005). **Visual scene displays.** *Alternatively Speaking, 8*(2), 7.
NARIC Accession Number: J56436
ABSTRACT: Article briefly discusses visual scene displays, a new technology that uses digital photographs of personalized scenes rather than icons to represent language and support communication. Current research focuses on designs applicable to young children, adults with aphasia, children and youth with ASD, and individuals with significant cognitive and linguistic delays.

2004

Green, V.A., Lancioni, G.E., O'Reilly, M.F., Seely-York, S., Sigafoos, J., Son, S.H., Weru, J. (2004). **Transferring AAC intervention to the home.** *Disability and Rehabilitation, 26*(21/22), 1330-1334.
NARIC Accession Number: J48461
ABSTRACT: Case study evaluated the procedures for transferring AAC intervention from an initial clinical trial to the home setting for a 12-year-old boy with autism. The initial intervention goal was to teach the child to use a voice-output communication aid. After learning to use the device to request preferred objects in the clinical trial, the intervention was transferred to the home. Follow-up with the parent was conducted by e-mail and telephone. Videotapes were made of initial in-home sessions to enable evaluation of the child's progress. Results showed that the program was successful in teaching the participant to use a portable augmentative and alternative device during the clinical trial and then in two home-based activities.

2003

Diehl, S.F. (2003). **The SLP's role in collaborative assessment and intervention for children with ASD.** *Topics in Language Disorders, 23*(2), 95-115.
NARIC Accession Number: J45885
ABSTRACT: Article explains the speech-language pathologist's (SLP's) role as part of a collaborative team in assessing and developing interventions for deficits in social interaction and communication in children diagnosed with ASD. Two case studies illustrate the application of both the SLP's expert knowledge of communication with specific knowledge of ASD through the assessment and intervention process. Includes section on AAC evaluation and suggests AACs for use with children with ASD.

Diehl, S. (2003). **Epilogue: Autism spectrum disorder: The context of speech-language pathologist intervention.** *Language, Speech, and Hearing Services in Schools, 34*(3), 177-179.
NARIC Accession Number: J45913
ABSTRACT: Summarizes and comments on a series of articles focused on effective communication interventions for children with autism spectrum disorder (ASD). Topics discussed in the articles focused on (1) incorporating the family perspective in assessment and intervention; (2) considering the impact of social, behavioral, and communications challenges experienced by children with ASD; and (3) understanding how the perspective differences found in children with ASD affect communication assessment and treatment. Articles are included separately in the NARIC collection under accession numbers J45906 through J45912.

Diehl, S. (2003). **Prologue: Autism spectrum disorder: The context of speech-language pathologist intervention.** *Language, Speech, and Hearing Services in Schools, 34*(3), 177-179.
NARIC Accession Number: J45906
ABSTRACT: Introduces a series of articles focused on effective communication interventions for children with autism spectrum disorder (ASD). Articles respond to the increasing need for knowledge related to serving children with ASD and their families. Effective communication intervention with this population requires not only specialized knowledge in communication, but also a solid understanding of ASD. Meeting the social, behavioral, and communication challenges of this population requires a broad knowledge base with perspectives from many disciplines. Current research is integrated from many perspectives into recommendations for practice, and information is provided to supplement the communication support of children with ASD. Articles are included separately in the NARIC collection under accession numbers J45907 through J45913.

Evans, J., Johnston, S., Nelson, C., & Palazolo, K. (2003). **The use of visual supports in teaching young children with autism spectrum disorder to initiate interactions.** *Augmentative and Alternative Communication, 19*(2), 86-103.
NARIC Accession Number: J47021
Abstract: study examined the effectiveness of an intervention strategy in teaching three preschool children with autism spectrum disorder to use a visual support (a graphic symbol representing "Can I play?) to request entrance into play activities. The intervention strategy involved creating communicative opportunities, providing a model of the desired behavior, prompting the participant to engage in the desired behavior, and providing access to natural consequences for appropriate participant responses. Results showed that the intervention was effective in teaching participants to request entrance into play activities for all three participants. The collateral impact of graphic symbol use on verbal language and competing behaviors is discussed.

Mirenda, P. (2003). **Toward functional augmentative and alternative communication for students with autism: manual signs, graphic symbols, and voice output communication aids.** *Language, Speech, and Hearing Services in Schools, 34*(3), 203-216.
NARIC Accession Number: J45909
ABSTRACT: Article summarizes research and directions for future research with regard to two questions related to the delivery of AAC supports to children with autism: (1) what AAC modality is preferable to use? And (2) what do we know about the use of voice output communication aids (VOCAs) with people with autism? Evidence for and against the use of manual signing, graphic symbols, and VOCAs are presented. Issues that may influence the selection of one AAC technique over another include: natural speech development, practicality, and availability of natural communities of communication partners.

Neisworth, J.T., & Wert, B.Y. (2003). **Effects of video self-modeling on spontaneous requesting in children with autism.** *Journal of Positive Behavior Interventions, 5*(1), 30-34.
NARIC Accession Number: J45673
ABSTRACT: Study evaluates the use of video self-monitoring (VSM) to improve the social-communication skills of four young children with autism by increasing the frequency of spontaneous request behaviors. VSM allows individuals to develop and observe models of their own appropriate behavior. Results showed that VSM was effective in increasing spontaneous requesting behavior in all four participants.

2002

Bondy, A., & Frost, L. (2002). ***A picture's worth: PECS and other visual communication strategies in autism.*** Bethesda: Woodbine House, Inc.
NARIC Accession Number: R08218
ABSTRACT: Guide to the Picture Exchange Communication System (PECS), a visual communication strategy developed by the authors. PECS allows children with autism to use pictures to communicate without a prompt from another person. Presents many real-life case studies, along with a complete series of lessons, from beginner to more advanced techniques. Also provides an overview of other AAC systems.

2001

(2001). **Autism: Part I.** *Behavior Modification, 25*(5), 671-808.
NARIC Accession Number: R08203
ABSTRACT: Journal issue with seven articles related to behavior modification for children and adults with autism. Specific topics include: (1) the contribution of applied behavior analysis to the education of people with autism; (2) classification, causation, and early intensive behavioral intervention for autism; (3) Skinner's analysis of verbal behavior for children with autism; (4) the Picture Exchange Communication System; (5) identifying early intervention targets for children with autism in inclusive school settings; (6) including children with autism in general education; and (7) teaching social skills to people with autism.

Arnold, C.L., Frea, W.D., & Vittimberga, G.L. (2001). **A demonstration of the effects of augmentative communication on the extreme aggressive behavior of a child with autism within an integrated preschool setting.** *Journal of Positive Behavior Interventions, 3*(4), 194-198.
NARIC Accession Number: J43074
ABSTRACT: Article presents the positive effects of AAC strategies on the challenging behaviors of individuals with developmental disabilities. Case study demonstrates the effects of picture exchange communication on the extreme aggressive behavior of a child with autism. Results indicate aggression was reduced and eliminated in a short period of time when picture communication was introduced.

2000

Angelo, D.H. (2000). **Impact of augmentative and alternative communication devices on families.** *Augmentative and Alternative Communication, 16(*1), 37-47.
NARIC Accession Number: J38679
ABSTRACT: Study intended to identify the impact of AAC devices on families, and to determine implications for intervention. Data are from 114 responses to a survey of over 500 families whose children have received AAC devices in Pennsylvania from 1985 to 1996. Data include parental responses on a Likert scale to 76 statements regarding the impact of AAC on users and

family members, divided into the following categories: family roles and responsibilities; implementation of AAC devices; communication and relationships; reactions and concerns; opportunities and outcomes for AAC user; consumer satisfaction and funding; and involvement in advocacy.

Koegel, L.K. (2000). **Interventions to facilitate communication in autism.** *Journal of Autism and Developmental Disorders, 30*(5), 383-391.
NARIC Accession Number: J40771
ABSTRACT: Article discussing opportunities for research into interventions to improve communication by persons with autism based on current literature on the social/communicative aspects of development. Themes presented are: spontaneity, initiations, and the functions of language; the precursors related to positive outcomes and measurement; family involvement in intervention programs; the best practices for implementation of communicative interventions; the interrelationship between language and other behavioral symptoms of autism; and the social and pragmatic use of language. These areas are discussed in terms of improving assessment and intervention practices to produce greater long-term comunicative outcomes for individuals with autism.

Documents from the Education Resource Information Center (ERIC) search at www.eric.ed.gov are listed below:

2009

Ahlsen, E., Sandberg, A.D., & Thunberg, G. (2009). **Speech-generating devices used at home by children with autism spectrum disorders: A preliminary assessment.** *Focus on Autism & Other Developmental Disabilities, 24*(2), 104-114.
ERIC #: EJ838042
ABSTRACT: Three children diagnosed within the autism spectrum between the ages of 5 and 7 years at different stages of communication development were supplied with speech-generating devices (SGDs) in their homes. The parents were taught to introduce the SGDs into home routines and the effects were evaluated naturalistically. Videotapes recorded by the parents before and during SGD use were coded with respect to communication effectiveness, mode, role in turn taking, and engagement in activity. Findings varied among the children and activities, but an increased level of communication effectiveness was seen during SGD use for all children. Variations of outcome among the three children and factors of importance for effective SGD use in the homes of children with ASD are discussed. (Contains 6 tables.)

Brunner, D.L., & Seung, H.K. (2009). **Evaluation of the efficacy of communication-based treatments for autism spectrum disorders: A literature review.** *Communication Disorders Quarterly, 31*(1), 15-41.
ERIC #: EJ860385
ABSTRACT: This literature review examines the present level of evidence in support of communication-based treatments for children with ASD. Reviews to date have reported on research published through 2002. The current article included 36 studies published between 2002 and 2007. Best available evidence is presented for seven treatment categories: applied behavior analysis, naturalistic behavioral, developmental, classroom-based, video modeling, social skills, and AAC. Findings indicate that empirical support has been obtained for the efficacy of several methods, whereas other methods remain in an exploratory stage of investigation.

Moore, S., & Rettig, M.A. (2009). **Teaching partner-focused questions to students who use augmentative communication to initiate and lengthen their communication experiences.** *Washburn University, Department of Education: October, 2009.*
ERIC #: ED506663
Available in full-text at: http://eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED506663
ABSTRACT: Students that use augmentative communication often have a hard time breaking into conversations, initiating conversations and then being able to sustain a conversation. Students that use augmentative communication (ACC) need training in not only the use of the machine but in social communication rules, and in strategies on how to bypass functional limitations in the augmentative device. Just giving them the device will not make them competent communicators. This study involved procedures to teach students partner-focused questions in an attempt to increase the use of their ACC devices in social communication with others. The training provided to participants in the use of partner-fo-

cused questions did increase the number of such questions these students used. However, the most dramatic finding was the marked increase in extension statements or questions used by the participants. (Contains 3 tables.)

2008

Cafiero, J.M., & Meyer, A. (2008). **Your child with autism: When is augmentative and alternative Communication (AAC) an appropriate option?** *Exceptional Parent, 38*(4), 28-30.
ERIC #: EJ790016
ABSTRACT: The incidence of ASD is increasing at an alarming rate. Autism affects the ability to communicate and, in fact, between 33 and 55 percent of individuals with ASD never develop communication skills that are sufficient to meet their most simple daily needs. The National Research Council stated in its 2001 landmark publication, Educating Children with Autism, that functional spontaneous communication is a critical skill that must be addressed in all interventions for children with ASD. Communication is an essential part of humanity. Every individual with communication difficulties must be provided with the tools, strategies, and technology needed to be able to communicate. Communication supports must be provided as soon as a child is diagnosed with ASD. AAC is any tool, strategy, or technology that compensates for, enhances, expands, or helps develop communication skills. AAC can be unaided or aided. Examples of unaided AAC are manual signs, gestures, and body language. Examples of aided AAC include communication boards, speech generating devices, keyboards, email, and instant messaging. This article will address aided AAC. (Contains 1 table and 1 figure.)

Chiang, H.M., & Lin, Y.H. (2008). **Expressive communication of children with autism.** *Journal of Autism & Developmental Disorders, 38*(3), 538-545.
ERIC #: EJ787424
ABSTRACT: Expressive communication of Australian and Taiwanese children with autism who had limited spoken language was observed in naturalistic settings. Communicative forms, functions, and partners were investigated. No significant differences existed in the characteristics of expressive communication between children with speech and those without speech. No significant differences existed in characteristics of expressive communication between children who used aided AAC and those who did not use aided AAC. Children with autism who were observed at regular schools communicated with their peers more often than did those who were observed at special schools.

Nunes, D.R.P. (2008). **AAC interventions for autism: A research summary.** *International Journal of Special Education, 23*(2), 17-26.
ERIC #: EJ814395
Available in full-text at: http://eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=EJ814395
ABSTRACT: Fifty-six studies from 1980 to 2007 involving the use of AAC by individuals with autism were reviewed. The majority of the studies used single-subject research designs and emphasized language production skills. Many investigations were held in artificial language learning settings, and a few involved parents and teachers as intervention agents. Gaps in the provision of the participants' cognitive, language, and sensory-motor measures were detected in the analysis of the 51 studies that provided individual participant data. Despite these limitations, this report revealed that communication interventions for individuals with autism that have incorporated sign language/total communication, visual-graphic symbols, and/or speech generating devices have had successful outcomes.

2007

Hanline, M.F., & Nunes, D. (2007). **Enhancing the alternative and augmentative communication use of a child with autism through a parent-implemented naturalistic intervention.** *International Journal of Disability, Development, & Education, 54*(2), 177-197.
ERIC #: EJ764328
ABSTRACT: The effects of a parent-implemented naturalistic intervention on the communication skills of a 4-year-old boy with autism using an alternative and augmentative communication system were investigated. The child's mother was taught to use four naturalistic teaching strategies that incorporated a picture communication system during two typical home routines. Generalization probes to assess the caregiver's use of the intervention techniques and generalization of the child's communication outcomes were conducted in two similar interactions. A multiple baseline design was used to evaluate the effects of the intervention. Data indicated an increase in the use of two caregiver-teaching strategies across two routines following treatment. No consistent changes were observed in the use of the other caregiver strategies across the routines. An increase in

the child's frequency of initiations and responses and the use of the communication system also were observed. (Contains 3 tables and 11 figures.)

2006

Noens, I., van Berckelaer-Onnes, I., van Duijn, G., & Verpoorten, R. (2006). **The ComFor: An instrument for the indication of augmentative communication in people with autism and intellectual disability.** *Journal of Intellectual Disability Research, 50*(9), 621-632.
ERIC #: EJ740657
ABSTRACT: Background: The ComFor (Forerunners in Communication) is an instrument to explore underlying competence for augmentative communication. More specifically, it measures perception and sense-making of non-transient forms of communication at the levels of presentation and representation. The target group consists primarily of individuals with autism and intellectual disability (ID) without or with only limited verbal communication. The ComFor is suitable for children and adults with a developmental level between 12 and 60 months. This paper describes the theoretical framework and structure of the ComFor, the results of a study on its psychometric properties and its clinical uses. Method: The ComFor was tested on a sample of 623 children and adults from the Netherlands and Flanders: a group with autism and ID (n=310); a group with ID without autism (n=174); and a control group of typically developing children (n=139). Results: The data generally support the reliability and validity of the ComFor. Internal consistency, inter-rater and test—retest reliability were found to be good. Construct validity (internal structure, convergent and divergent patterns) was established in different ways. The criterion-related validity has yet to be established, as predictive data are not available at the moment. Conclusion: Taken together, the results indicate that the ComFor is a promising instrument to explore underlying competence for augmentative communication. Areas for future research are outlined and the clinical relevance is discussed.

2001

Drasgow, E., & Sigafoos, J. (2001). **Conditional use of aided and unaided AAC: A review and clinical case demonstration.** *Focus on Autism & Other Developmental Disabilities, 16*(3), 152-61.
ERIC #: EJ634886
ABSTRACT: This article examines the use of multimodal AAC with individuals with autism and other developmental disabilities. It also reviews instructional strategies for developing conditional use of aided and unaided AAC. A case study of an adolescent boy illustrates the acquisition of aided and unaided AAC based on the presence or absence of an aided device. (Contains references.)

Harn, W.E., & Ogletree, B.T. (2001). **Augmentative and alternative communication for persons with autism: History, issues, and unanswered questions.** *Focus on Autism & Other Developmental Disabilities, 16*(3), 138-40.
ERIC #: EJ634884
ABSTRACT: This introductory article to a special issue on the use of AAC for persons with autism briefly reviews the history of AAC with this population, summarizes issues identified in the following articles, and notes questions that remain unanswered. (Contains references.)

Koul, R.K., Sancibrian, S., & Schlosser, R.W. (2001). **Effects of symbol, referent, and instructional variables on the acquisition of aided and unaided symbols by individuals with autism spectrum disorders.** *Focus on Autism & Other Developmental Disabilities, 16*(3), 162-69.
ERIC #: EJ634887
ABSTRACT: This article reviews research on the role of symbolic, referent, and instructional variables on the acquisition of AAC symbols by individuals with autism and severe speech and language impairments. Two vignettes illustrate findings of the review. (Contains references.)

Mirenda, P. (2001). **Autism, augmentative communication, and assistive technology: What do we really know?** *Focus on Autism & Other Developmental Disabilities, 16*(3), 141-51.
ERIC #: EJ634885
ABSTRACT: This article provides a critical review of empirical investigations on the use of AAC and assistive technology with individuals with autism or pervasive developmental disorder. The review is presented by six topic areas: assessment, staff/family training, supports for augmented input, supports for augmented input plus output, supports for augmented output, and assistive technology. (Contains references.)

Documents from the National Library of Medicine PubMed search at www.pubmed.com are listed below:

2006

Lancioni, G.E., O'Reilly, M., Sigafoos, J., & Son, S.H. (2006). **Comparing two types of augmentative and alternative communication systems for children with autism.** *Pediatric Rehabilitation, 4,* 389-395.
PMID #: 17111565
ABSTRACT: This study compared acquisition and preference for two types of AAC systems in three preschoolers with autism. Acquisition of requesting behavior using a picture-exchange system verses a voice-output communication aide (VOCA) was compared in an alternating treatments design. Following acquisition, both ACC systems were simultaneously available and the child could select which one of the two systems to use. There was little difference between picture-exchange and VOCA in terms of acquisition rates. Two children demonstrated a consistent preference for picture-exchange and the third showed a preference for the VOCA. Both speed of acquisition and system preference should be considered when designing AAC interventions for children with autism and related developmental disabilities.

2004

Jørgensen, K.K., Ormhaug, B.M., Øvreeide, K.D., Oxholm, B., von Tetzchner, S., Warme, R. (2004). Acquisition of graphic communication by a young girl without comprehension of spoken language. Disability & Rehabilitation, 26(21-22), 1335-46.
PMID #: 15513734
ABSTRACT: PURPOSE: To describe a graphic-mode communication intervention involving a girl with intellectual impairment and autism who did not develop comprehension of spoken language. The aim was to teach graphic-mode vocabulary that reflected her interests, preferences, and the activities and routines of her daily life, by providing sufficient cues to the meanings of the graphic representations so that she would not need to comprehend spoken instructions. METHOD: An individual case study design was selected, including the use of written records, participant observation, and registration of the girl's graphic vocabulary and use of graphic signs and other communicative expressions. RESULTS: While the girl's comprehension (and hence use) of spoken language remained lacking over a 3-year period, she acquired an active use of over 80 photographs and pictograms. CONCLUSIONS: The girl was able to cope better with the cognitive and attentional requirements of graphic communication than those of spoken language and manual signs, which had been focused in earlier interventions. Her achievements demonstrate that it is possible for communication-impaired children to learn to use an AAC system without speech comprehension, provided the intervention utilizes functional strategies and non-language cues to the meaning of the graphic representations that are taught.

Documents from the Evidence in Augmentative and Alternative Communication (EVIDAAC) search at www.evidaac.com are listed below:

According to EVIDAAC evidence is rated using scales that are appropriate for the specific design being appraised. The following rating scales are used: EVIDAAC Systematic Review Scale, adapted PEDro Scale, EVIDAAC Single Scale, and the EVIDAAC Comparative Single-Subject Experimental Design System (CSSEDARS). Studies are rated in terms to their methodological quality and studies are rated differently depending on the design being used. For example, randomized control trials (RCTs); non-RCTs; and case series are rated using the adapted PEDro Scale. Single-subject experimental designs are appraised using the CSSEDARS. For further information and for the full-text versions of the rating scales please visit www.evidaac.com/ratings.

2007

Nye, C., & Schwartz, J.B. (2007). **A systematic review, synthesis, and evaluation of the evidence for teaching sign language to children with autism.** *EBP Briefs, 1,* 1-17.
Design: Systematic Review/Meta-Analysis. Score: 15 out of 20
ABSTRACT: One of the signature characteristics of children with autism is failure to develop adequate communication skills. Clinicians often are faced with the decision of selecting and implementing an aided or unaided augmentative or alternative communication system for these individuals. Given that a clinician may recommend sign language training for a child with autism, what evidence is available upon which to base this decision?

2006

Mancil, G.R. (2006). **Functional communication training: A review of the literature related to children with autism.** *Education and Training in Developmental Disabilities, 41,* 213-224.
Design: Systematic Review. Score: 4 out of 14
ABSTRACT: Numerous researchers have employed functional communication training (FCT) to address both the communication and behavioral needs of children with autism. Thus, the purpose of this review is to examine FCT, particularly, the environments and individuals involved in the training and the effectiveness of ECT with children who have a diagnosis of Autism Spectrum Disorder (ASD) and to provide suggestions for practitioners and researchers. FCT consistently reduces challenging behavior and increases communication; however, the majority of research is clinically based and focuses on one communication mand. Future research teams should address maintenance and generalization by training collecting data across time.

2004

Bopp, K.D., Brown, K.D., & Mirenda, P. (2004). **Speech-language pathologists roles in the delivery of positive behavior support for individuals with developmental disabilities.** *American Journal of Speech-Language Pathology, 13,* 5-19.
Design: Narrative Review. Score: 1 out of 14
ABSTRACT: Positive behavior support interventions such as functional communication training (FCT) and visual schedules are increasingly being used with individuals with autism and other severe developmental disabilities who engage in problem behavior and use AAC. The increasing use of these communication interventions has implications for speech-language pathologists who provide support to these individuals. The purpose of this tutorial is to summarize the research regarding the use of FCT/AAC interventions and visual schedules, and to provide suggestions for the roles that speech language pathologists can play with regard to assessment, intervention design, and implementation in school and home settings.

1997

Mirenda, P. (1997). **Supporting individuals with challenging behavior through functional communication training and AAC: Research review.** *Augmentative and Alternative Communication, 13,* 207-225.
Design: Narrative Review. Score: 2 out of 14
ABSTRACT: The term "functional communication training" (FCT) has been used over the past decade to refer to a set of procedures designed to reduce challenging behavior by teaching functionally equivalent communication skills. Functional communication training requires a thorough assessment to identify the function (or "message") of the behavior of concern and systematic instruction related to the new communicative behaviors. The growing body of empirical literature demonstrating the efficacy and mechanisms of this procedure has included a number of examples in which AAC techniques were used during intervention. The purpose of this review is to summarize the extant FCT/AAC research in an accessible format and to identify areas for future research in this area.

Quick Looks

Autism and AAC Online Resources

AAC Institute
Contact: www.aacinstitute.org/AACInstituteInformation/contactus.html
www.aacinstitute.org

AAC Terminology
Organized for Augmentative and Alternative Communication by Dr. Beukelman & Dr. Mirenda, 1992. By Gary D. Cumley, University of Wisconsin-Stevens, gcumley@uwsp.edu. Website maintained by Barkley AAC Center and the Munroe-Meyer Institute for Genetics and Rehabilitation at the University of Nebraska.
AAC Links: aac.unl.edu/AAClinks.html
aac.unl.edu/academic/AACGBM1.html

American Speech Language Hearing Association (ASHA)
Toll Free Professionals/Students:
800/498-2071 (V), 301/897-5700 (TTY)
Toll Free Public: 800/638-8255
Email: actioncenter@asha.org
www.asha.org

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Quick Looks continued...

Autism and AAC Online Resources

Augmentative and Alternative Communication (AAC) Connecting Young Kids (YAACK)
aac.unl.edu/yaack

Autism Research Institute (ARI)
Toll Free: 866/366-3361
www.autism.com

Autism Speaks
Email: contactus@autismspeaks.org
www.autismspeaks.org

Autism Society of America (ASA)
Toll Free: 800/328-8476, 301/657-0881
Email: www.autism-society.org/site/PageServer?pagename=asa_contact
Locate a Local Chapter: www.autism-society.org/site/PageServer?pagename=ChapterMap
www.autism-society.org

Autism 101: A Free Online Course form the ASA
www.autism-society.org/site/PageServer?pagename=about_course

Autism Source: The ASA's Online Referral Database
www.autismsource.org

Autism Support Network
Email: info@AutismSupportNetwork.com
www.autismsupportnetwork.com

Center for AAC & Autism
Toll Free: 866/998-1726
Email: lamp@aacandautism.com
www.aacandautism.com

First Signs, Inc.
Email: info@firstsigns.org
www.firstsigns.org

International Society for AAC
Contact/Chapters: www.isaac-online.org/en/contact.html
www.isaac-online.org/en/home.shtml

Let's Cook: Life Skills for Kids on the Autism Spectrum
www.mywire.com/pubs/Lets-Cook

National Association of Residential Providers for Adults with Autism
Email: info@narpaa.org
www.narpaa.org

National Autism Association (NAA)
Toll Free: 877/622-2884
Email: naa@nationalautism.org
www.nationalautismassociation.org

National Institute on Deafness and Other Communication Disorders (NICHD)
Toll Free Information Line:
800/241-1044 (V), 800/241-1055 (TTY)
Email: nidcdinfo@nidcd.nih.gov
www.nidcd.nih.gov

Online Asperger Syndrome Information and Support @ MAAP
Email: info@aspergersyndrome.org
aspergersyndrome.org

Organization for Autism Research (OAR)
Contact: www.researchautism.org/contact/index.asp
www.researchautism.org

SEDL's Vocational Rehabilitation Service Models for Individuals with Autism Spectrum Disorders
Phone: 512/476-6861
Email: john.westbrook@sedl.org
www.autism.sedl.org

U.S. Autism & Asperger Association
Email: information@usautism.org
www.usautism.org

United States Society for Augmentative and Alternative Communication
Email: info@ussaac.org
www.ussaac.org

Search Terms for Autism Spectrum Disorders & Augmentative and Alternative Communication

- Adjustment
- Assistive Technology
- Audiovisual Materials
- Augmentative and Alternative Communication
- AAC
- Autism/Spectrum Disorders
- ASD
- Behavior Modification
- Caregivers
- Case Studies
- Child Development
- Children with Disabilities
- Communication Aids/Devices/Disorders/ Interpersonal/Nonverbal/Skills/Strategies/Verbal
- Community Living
- Comparative Analysis
- Culture
- Daily Living Skills
- Developmental Disabilities
- Diversity
- Early Intervention
- Emotions
- Evaluation Methods/Program/Techniques
- Families
- Family/Centered Care/Life
- Goal Setting
- Home-Based
- Inclusion
- Information Resources
- Instructional Methods
- Intervention
- Language
- Learning
- Literature Reviews
- Modeling
- Motivation
- Naturalistic Observation
- Outcomes
- Parent Child Relationship
- Parent Education
- Parent Participation
- Parenting Skills
- Parents
- Pictorial Stimuli
- Preschool
- Quality of Life
- Questioning Techniques
- Rehabilitation Engineering Centers
- Remote Service Delivery
- Research/Development/Methodology/Reviews/ Utilization
- Secondary Education
- Social Skills
- Socialization
- Speech/Therapy
- Symbolic Language/Learning
- Teaching/Methods
- Training Programs
- Transition
- Treatment Outcomes

The jigsaw ribbon is recognized as the official ribbon for the National Autism Association.

Autism awareness ribbon meaning:

The puzzle pattern on the awareness ribbon reflects the mystery and complexity of the autism spectrum. The autism awareness puzzle ribbon colors and shapes represent the diversity of the people and families living with the condition. The brightness of the puzzle ribbon color signals hope that through increased awareness of autism, early intervention, and appropriate treatments, people with autism will lead fuller, more complete lives.

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- Education Resources Information Center
- National Clearinghouse of Rehabilitation Training Materials
- Campbell and Cochrane Collaborations
- PubMed and other National Library of Medicine databases
- Agency for Health Care Policy and Research databases
- Center for International Rehabilitation Research Information and Exchange
- and other reputable, scholarly information resources.

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