UNITED
FOR COMMUNICATION
CHOICE

A Selection of Supportive Peer-Reviewed Publications

Last updated July 16, 2018

There is abundant evidence to support the use of the Rapid Prompting Method, facilitated communication, and similar methodologies that teach individuals with unreliable speech to communicate effectively by typing or pointing to letters on a letterboard. Some of this research provides evidence that non-speaking individuals cannot be assumed to lack intelligence or a desire to communicate socially, and therefore should be presumed capable of expressing complex thought and engaging with others. This evidence shows that most assessments of intelligence are not reliable for autistics and anyone else who cannot speak or control their bodies reliably. Some of the research provides evidence that autism is primarily a neuro-motor condition rather than a social or behavioral one. Some of this research provides evidence of the need for and role of well-trained communication partners in both teaching and supporting the use of augmentative and alternative communication (AAC), especially in users with motor disabilities. Some of the research stresses the importance of communication choice, of the existence of individual idiosyncrasies in communication, and of the need to tailor training and AAC methods and devices to individual differences. And some of the research demonstrates that no single AAC training methodology or AAC method or device that allows an individual to communicate in an open-ended manner has been demonstrated in randomized controlled trial studies to be efficacious for non-speaking or unreliably-speaking autistics. Indeed, the research demonstrates that our understandings of both that segment of the autism population and of AAC are in their infancy.

Where possible, links are provided to open access versions of the articles. If you would like an article that is behind a paywall, you may be able to obtain the article for free by writing to one of the authors and requesting it.

I. Rapid Prompting Method Literature

McQuiddy, V., & Brennan, A.M. (2016), *Occupational Therapy Using Rapid Prompting Method: A Case Report*, Autism Open Access, 6:165 (open access here)

> Abstract: Individuals with autism spectrum disorders that are nonverbal or have significantly limited verbal ability often demonstrate difficulties with learning and communication that impact their ability to participate in everyday, functional activities. Healthcare providers and educators that provide intervention for individuals with autism spectrum disorders utilize a variety of interventions and treatment techniques while tailoring their interventions to consider the unique needs of the individual with autism. This case report reviews how incorporating Rapid Prompting Method, a relatively new

teaching technique for individuals with autism spectrum disorders, into occupational therapy treatment for a young adult male with autism with significantly limited verbal ability improved his functional participation, including communication, behavior, and engagement in routine activities of daily living.

Major Point: Case study highlighting idea that many difficulties and behavioral issues related to non-verbal or minimally verbal autism may be reduced with the Rapid Prompting Method, a relatively new intervention providing an alternative form of teaching and communication

Chen, G.M., Yoder, K.J., Ganzel, B.L., Goodwin, M.S., & Belmonte, M.K. (2012), *Harnessing Repetitive Behaviours to Engage Attention and Learning in a Novel Therapy for Autism: An Exploratory Analysis*, Frontiers in Psychology, 3:12 (open access here)

Abstract: Rigorous, quantitative examination of therapeutic techniques anecdotally reported to have been successful in people with autism who lack communicative speech will help guide basic science toward a more complete characterisation of the cognitive profile in this underserved subpopulation, and show the extent to which theories and results developed with the high-functioning subpopulation may apply. This study examines a novel therapy, the "Rapid Prompting Method" (RPM). RPM is a parent-developed communicative and educational therapy for persons with autism who do not speak or who have difficulty using speech communicatively. The technique aims to develop a means of interactive learning by pointing amongst multiple-choice options presented at different locations in space, with the aid of sensory "prompts" which evoke a response without cueing any specific response option. The prompts are meant to draw and to maintain attention to the communicative task—making the communicative and educational content coincident with the most physically salient, attention-capturing stimulus—and to extinguish the sensory–motor preoccupations with which the prompts compete. Video-recorded RPM sessions with nine autistic children ages 8–14 years who lacked functional communicative speech were coded for behaviours of interest. An analysis controlled for age indicates that exposure to the claimed therapy appears to support a decrease in repetitive behaviours and an increase in the number of multiple-choice response options without any decrease in successful responding. Direct gaze is not related to successful responding, suggesting that direct gaze might not be any advantage for this population and need not in all cases be a precondition to communication therapies.

Major Point: Highlights motor and sensory based approach of RPM and hypothesizes its possibilities as a communicative therapy for those with non-speaking autism

II. Facilitated Communication Literature

Mintz, K. (2017), *Ableism, ambiguity, and the Anna Stubblefield case*, Disability & Society, 32:10, 1666-1670 (open access here)

Abstract: This article discusses the ongoing case of Anna Stubblefield, a former Rutgers University philosophy professor who was convicted of the sexual assault of an African American man with cerebral palsy. On appeal, the conviction was reversed, and as of this submission Stubblefield is awaiting news from the state of New Jersey Supreme Court as to whether there will be a retrial. This piece engages with Sherry's article in this journal, and dissects the many layers of ableism at play in this case, arguing that justice will not be served until the alleged victim gets to be heard.

Major Point: The author—a Stanford PhD student who has cerebral palsy and communicates with AAC—identifies many levels of ableism in the Stubblefield case.

Ashby, C., Jung, E., Woodfield, C., Vroman, K., & Orsati, F. (2015), *"Wishing to go it alone": The complicated interplay of independence, interdependence and agency*, Disability and Society, 30:10, 1474-1489 (paywall access here)

Abstract: Some individuals with disabilities for whom verbal speech is not reliable use facilitated communication to express thoughts and ideas. While they may require intensive physical support initially, the goal is independent typing. However, this emphasis on fading support and independence bears consideration. We utilize a Disability Studies lens to frame practices around independence and the complicated interplay between interdependence, agency and voice. Based on qualitative analysis of communication training sessions, we present four findings: the complexity of the message versus fading of physical support, the emotional dimensions of independence, the facilitator's navigation of multiple roles, and the importance of facilitating agency. We also share implications of reframing independence and facilitating agency for the communication training process.

Major Point: Independence is a nuanced, complex and fluid concept; this paper examines those complexities in the lives of individuals working on fading support for communication.

Cardinal, D., & Falvey, M. (2014), ***The Maturing of Facilitated Communication: A Means Toward Independent Communication*****, Research and Practice for Persons with Severe Disabilities, 39:3, 189-194 (open access here)**

Abstract: Facilitated communication (FC) can be a successful means for people to learn to communicate effectively and independently. The preponderance of peer-reviewed articles supports FC as a useful tool for developing communication skills. While there has been a chasm of difference in qualitative versus quantitative studies on FC, researchers have produced a body of current literature confirming the method. Many people with significant intellectual disabilities, through the use of FC, have been able to demonstrate their ability to successfully communicate. We, as a profession, now need to respond with collaborative scholarship. In addition, revised position statements must be developed reflecting the past research findings and encouraging future research.

Major Point: Traces the research history of FC and articulates the ways that studies in the last two decades have validated the effectiveness of the method

Bigozzi, L., Zanobini, M., Tarchi, C., Cozzani, F., & Camba, R. (2012), ***Facilitated communication and autistic children: the problem of authorship*****, Life Span and Disability, 15:2, 55-74 (open access here)**

Abstract: This paper explores the authorship of the written production of children with autism who need to be physically and emotionally supported by a competent interlocutor in order to communicate. Facilitated Communication is a technique developed for this purpose. However, a significant part of the scientific community considers it a controversial technique because of the difficulty in determining the authentic author of the message. The aim of this study is to examine the written communication of six autistic boys in order to investigate and determine direct or indirect evidence of authorship. In particular, the focus is on the process of communication itself, to find behaviours or written expressions that could disprove the hypothesis of a direct influence of the facilitator. Six secondary school students diagnosed with autism participated in this study. Each student participated in 8 sessions of facilitated communication, 4 with one parent at home, 4 with an educator at school, both parent and educator assuming the role of facilitator. According to our data, evidence of authorship was represented in all categories supporting our hypothesis that facilitated communication can be authentically based both on authentic interactions and messages between both partners.

Major Point: Focuses on authenticity of facilitated communication and finds evidence of authorship in messages written by participants during facilitated communication sessions

Grayson, A., Emerson, A., Howard-Jones, P., & O'Neil, L. (2012), *Hidden communicative competence: Case study evidence using eye-tracking and video analysis*, Autism, 16:1, 75-86 (paywall access here)

> Abstract: A facilitated communication (FC) user with an autism spectrum disorder produced sophisticated texts by pointing, with physical support, to letters on a letterboard while their eyes were tracked and while their pointing movements were video recorded. This FC user has virtually no independent means of expression, and is held to have no literacy skills. The resulting data were subjected to a variety of analyses aimed at describing the relationship between the FC user's looking and pointing behaviours, in order to make inferences about the complex question of 'authorship'. The eye-tracking data present a challenge to traditional 'facilitator influence' accounts of authorship, and are consistent with the proposition that this FC user does indeed author the sophisticated texts that are attributed to him; he looks for longer at to-be-typed letters before typing them, and looks ahead to subsequent letters of words before the next letter of the word is typed.
>
> Major Point: Uses video-tracking to verify that the facilitated communication users' eye gaze targets letters before they move their hand toward the target

Tuzzi, A. (2009), *Grammar and lexicon in individuals with autism: A Quantitative analysis of a large Italian corpus*, Intellectual and Developmental Disabilities*,* 47:5, 373-385 (paywall access here)

> Abstract: Statistical and linguistic procedures were implemented to analyze a large corpus of texts written by 37 individuals with autism and 92 facilitators (without disabilities), producing written conversations by means of PCs. Such texts were compared and contrasted to identify the specific traits of the lexis of the group of individuals with autism and assess to what extent it differed from the lexis of the facilitators. The purpose of this research was to identify specific language features using statistical procedures to analyze contingency lexical tables that reported on the frequencies of words and grammatical categories in different subcorpora and among different writers. The results support the existence of lexis and distributional patterns of grammatical categories that are characteristic of the written production of individuals with autism and that are different from those of facilitators.
>
> Major Point: Establishes that the grammatical and lexical patterns of language produced by autistic individuals using FC are quantitatively different from language produced by their non-autistic facilitators

Niemi, J., & Kärnä-Lin, E. (2002), ***Grammar and Lexicon in Facilitated Communication: A Linguistic Authorship Analysis of a Finnish Case,*** **Mental Retardation, 40:5, 347-357 (paywall access here)**

Abstract: This case study adds a new dimension to the discourse on the authorship issue in facilitated communication. The linguistic structure produced by a young Finnish man with severe cerebral palsy was examined. Data are based on transcripts he produced from 1993 until 1996 after facilitated communication had been introduced to him. In the data analysis, as explicit criteria for his idiosyncrasies, we used patterns typical of children acquiring Finnish as their first language and those found in normal slips of the tongue, acquired aphasia, and specific language impairment. Based on the analysis (i.e. the idiosyncrasy and agrammaticality of word-forms and sentences), we strongly suggest that his output can hardly be a product of any other speaker of Finnish, including that of his facilitators.

Major Point: Validates authorship of FC user by distinguishing between linguistic structure of language produced by the user and that of his facilitators and other Finnish speakers

Cardinal, D.N., Hanson, D., & Wakeham, J. (1996), ***Investigation of authorship in facilitated communication,*** **Mental Retardation, 34:4, 231-242 (paywall access here)**

Abstract: We examined whether facilitated communication users, under controlled conditions, could transmit rudimentary information to a naive facilitator. Forty-three students across 10 classrooms were shown a single randomly selected word with their facilitator out of the room. The facilitator then entered the room and asked the student to type the word, which was recorded exactly as typed and later evaluated; approximately 3,800 attempts were conducted over a 6-week period. Results showed that (a) under controlled conditions, some facilitated communication users can pass accurate information and (b) measurement of facilitated communication under test conditions may be significantly benefited by extensive practice of the test protocol, which could partially account for the inability of several past studies to verify facilitated communication-user originated output.

Major Point: Message passing study exploring the conditions under which message passing can be successful, suggesting that research design adopted unnecessary “over control” in early authorship studies

Sheehan, C.M., & Matuozzi, R.T. (1996), *Investigation of the Validity of Facilitated Communication Through the Disclosure of Unknown Information*, Mental Retardation, 34:2, 94-107 (paywall access here)

Abstract: Three individuals (8, 10, and 24 years old with diagnoses of autism and mental retardation) participated in a message-passing format to determine whether they could disclose information previously unknown to their facilitators. Results showed valid facilitated communication from each participant. The facilitated speakers participated in 14 sessions, each lasting approximately 1 to 1.5 hours. A wide range of information was collected, coded, and analyzed for validity, consistency, language difficulties, behavioral compliance, and style of facilitation. Out of 720 communicative interactions, participants disclosed 77 incidents of unknown information. Each participant revealed unique behaviors and styles of responding, and all were able to demonstrate genuinely independent communication through disclosure of specific information previously unknown to a facilitator, although much inconsistency was noted. Results suggest that a phenomena as complex as facilitated communication eludes a cursory exploration.

Major Point: Study demonstrating genuinely independent communication of FC users who disclosed information previously unknown to their facilitator, while also failing in some instances to disclose relevant information

Weiss, M.J., Wagner, S.H., & Bauman, M.L. (1996), *A Validated Case Study of Facilitated Communication*, Mental Retardation, 34:4, 220-230 (paywall access here)

Abstract: The case of a 13-year-old boy with autism, severe mental retardation, and a seizure disorder who was able to demonstrate valid facilitated communication was described. In three independent trials, short stories were presented to him, followed by validation test procedures with an uninformed facilitator providing physical support to the subject's arm. In Trials 1 and 3, several specific answers were provided that clearly indicated that the young man, not the uninformed facilitator, was the source of the information. Moreover, some responses seemed to imply that the subject was employing simple inferential and abstract reasoning. This case study adds to the small, but growing number of demonstrations that facilitated communication can sometimes be a valid method for at least some individuals with developmental disabilities.

Major Point: Three independent trials of information passing were conducted with third-party referees observing Trials 2 and 3 for added independent verification. Responses in Trials 1 and 3 indicate the young man was the author of answers provided and not the uninformed facilitator.

Biklen, D., Saha, N., & Kliewer, C. (1995), *How Teachers Confirm the Authorship of Facilitated Communication: A Portfolio Approach*, Research and Practice for Persons with Severe Disabilities, 20:1, 45-56 (paywall access here)

Abstract: Facilitated communication has been characterized as an alternative to speech that involves providing physical and emotional support to individuals with severe communication impairments as they type or point to letters or pictures (Biklen, 1993). The method has been described as relevant for individuals who cannot speak, whose speech is extremely limited (e.g., echolalic, comprising a few words) and who cannot point independently and reliably (Biklen, Morton, Gold, Berrigan, & Swaminathan, 1992; Crossley 1992). Qualitative and controlled studies of the method demonstrate its usefulness for some individuals and that facilitators may influence the communication of some individuals. This qualitative study of seven speech and language teachers and classroom teachers working with 17 students, focused on how and on what basis the teachers determined for themselves that the words typed were authored by their students and not by them, the facilitators. The teachers provided and described evidence for 13 of the 17 students of message passing skills (i.e., typing information not known to their facilitators that could be verified as accurate). The teachers noted that 3 of these 13 and 4 of the total 17 achieved some independent typing beyond typing their names and the date. Sixteen of the 17 students were judged by their teachers to have confirmed their typing/communication ability by virtue of other features: unique physical characteristics in typing or pointing, personal themes, recurring phrases, and stylistic qualities. These features appeared in their individual work but not in others, even though several shared facilitators. These findings suggest the potential value of a communication portfolio approach to documenting individuals' abilities to communicate with facilitation.

Major Point: Finds evidence of successful message-passing for 13 out of 17 participants; proposes a portfolio approach for documenting authorship of individuals who type to communicate with support

Biklen, D., Morton, M.W., Gold, D., Berrigan, C., & Swaminathan, S. (1992), *Facilitated Communication: Implications for individuals with autism*, Topics in Language Disorders, 12:4, 1-28 (paywall access here)

Abstract: Describes the use of facilitated communication (FC) with 43 students and young adults (aged 3–26 yrs) with autism. The authors examined the processes that teachers and others used to help Ss get started with FC, as well as strategies teachers used to help Ss with echoed speech to type nonecholalic communications. Unobtrusive measures were used to verify Ss' abilities to communicate their own thoughts through facilitated means. The implications of FC for other behaviors associated with autism are discussed. Conditions that assisted Ss in getting started with FC were communication content (i.e., open-ended conversation), physical support for the typing task, and attitudinal support in creating opportunities for communication. It is noted that different forms of participation in society would depend as much on support from the people around Ss as from the Ss' own capacities.

Major Point: Describes key components of FC (physical, emotional, and communicative support), provides recommendations starting FC, and highlights the importance of a supportive environmental context for typer success

Calculator, S.N., & Singer, K.M. (1992), *Letter to the editor: Preliminary validation of facilitated communication*, Topics in Language Disorders, 12:4, ix-xvi (paywall access here)

Abstract: In a sample size of five, the authors compared PPVT-R results with and without FC to validate the impact of FC on uncovering students' underlying communication skills. Distractors were used for facilitators. Three of the five subjects showed big differences when facilitated. A fourth also did with a different facilitator. "The risk of harming subjects by subjecting them to testing may be more an artifact of the way in which such testing is conducted than its mere use. The examiner who communicates a lack of expectation and creates a negative testing environment is certainly one who could adversely affect any child's performance."

Major Point: Emphasizes the negative impact examiners can have on a testing environment and raises issues with how students are assessed

Crossley, R., & Remington-Gurney, J. (1992), *Getting the words out: Facilitated communication training*, Topics in Language Disorders, 12:4, 29-45 (paywall access here)

Abstract: Examines the DEAL Communication Centre's use of facilitated communication training with 430 intellectually impaired individuals who attended the Australian facility from 1986 to 1990. 117 Ss had autism, 81 Down's syndrome, 5 Rett's syndrome, 5 tuberous sclerosis, 3 phenylketonuria, and 219 Ss had other types of intellectual impairment not related to those mentioned. More than half of the Ss showed that they had the potential to use spelling to augment their speech. Many grew able to communicate through typing and produced written language of such complexity as to challenge the beliefs about the language of people diagnosed as autistic or significantly impaired.

Major Point: Study of 430 intellectually impaired individuals with various diagnoses finding more than 50% demonstrated potential for speech augmentation through spelling

Crossley, R. (1992), *Getting the words out II: Case studies in facilitated communication training*, Topics in Language Disorders, 12:4, 46-59 (paywall access here)

Abstract: Presents case studies of (1) a woman with athetoid cerebral palsy who was 13 in 1974 and had lived in a mental institution for 9 yrs; (2) a 25-yr-old woman with phenylketonuria; and (3) a 12-yr-old boy with Down's syndrome. The cases recount how these patients with different diagnoses, each of whom had been labeled as significantly intellectually impaired, developed communication through spelling. Each patient required physical assistance to overcome neuromotor problems affecting his or her ability to access a communication aid. Training in nonspeech communication enabled them to challenge the labels they had been given.

Major Point: Study of three individuals, each with a different diagnosis, who all were able to develop communication through spelling, all requiring physical assistance to overcome neuromotor challenges

Biklen, D., & Schubert, A. (1991), *New Words: The Communication of Students with Autism*, Remedial and Special Education, 12:6, 46-57 (paywall access here)

Abstract: People with autism have a variety of communication difficulties that have been assumed to be related to cognitive deficits. The communication difficulties include an inability to speak words, speaking with echolalia or repetition of words or phrases previously heard, pronominal reversals, seeming inattentiveness, problems with social interaction, and lack of responsiveness to external events. This study reports on the effects of a method called facilitated communication in helping students with autism to unlock their ideas and to communicate through typing. The 21 students in this study reveal unexpected literacy and numeracy skills. The content and form of their communication challenges traditional assumptions about autism, especially the ability of people with autism to analyze and use language.

Major Point: Early qualitative study comparing spoken communication versus typed communication (FC) of individuals with autism, suggesting that with support, individuals may exhibit previously unknown competencies such as math or reading. Includes examples of typer authorship such as typing information unknown to the facilitator and unique spelling or typographical errors.

Biklen, D. (1990), *Communication Unbound: Autism and Praxis*, Harvard Educational Review, 60: 291-314 (paywall access here)

Abstract: Presents a qualitative study of a facilitative communication method developed by R. Crossley and colleagues in Melbourne, Australia. People who have been labeled severely autistic can selectively communicate with certain facilitators and in certain circumstances. In so doing, they not only challenge widely held assumptions about autism and the ability of people with autism to communicate, but also illustrate the effectiveness of an education-through-dialogue approach in which teachers and students learn from each other and where school validates personal expression. An outline of attitudinal dimensions and the range of skills needed for the practice of facilitated communication is included.

Major Point: First peer-reviewed article in the United States describing FC; challenges validity of competence assessments of individuals with autism who do not use their physical voices to communicate

III. Other AAC Literature

Gernsbacher, M. (2018), ***More Shared Responsibility for "More Appropriate Communication*****," Perspectives of the ASHA Special Interest Groups, 3:2, 58-67 (open access here)**

Abstract: The term "more appropriate communication" appears in more than 400 scholarly articles (according to Google Scholar). I examined the first 100 scholarly articles that pertained to communication between humans (rather than communication between computer networks). The question I sought to answer was who, according to the scholarly literature, bears responsibility for achieving "more appropriate communication?" Of the 100 scholarly articles examined, only a slim minority (N = 7) imply that more appropriate communication is a responsibility shared among two or more communication partners, and most of these articles address more appropriate communication between literal peers, such as undergraduate students with other undergraduate students. The majority of scholarly articles (N = 61) imply that the responsibility for more appropriate communication lies with the more powerful communication partners (i.e., people who have more status, experience, or resources). The remaining third of the scholarly articles (N = 32) imply that responsibility for more appropriate communication lies with the less powerful communication partners, and these less powerful communication partners are frequently children with developmental disabilities. I conclude by suggesting that the responsibility for more appropriate communication, particularly with developmentally disabled children, either should be assumed by the more powerful communication partners or should be shared.

Major Point: "[T]he responsibility for more appropriate communication, particularly with developmentally disabled children, either should be assumed by the more powerful communication partners or should be shared."

Morin, K.L, Ganz, J.B., Gregori, E.V., Foster, M.J., Gerow, S.L., Genç-Tosun, D., & Hong, E.R. (2018), ***A systematic quality review of high-tech AAC interventions as an evidence-based practice*****, Augmentative and Alternative Communication, 34:2, 104-117 (paywall access here)**

> Abstract: Although high-tech augmentative and alternative communication (AAC) is commonly used to teach social-communication skills to people with autism spectrum disorder or intellectual disabilities who have complex communication needs, there is a critical need to evaluate the efficacy of this approach. The aim of this systematic review was to evaluate the quality of single-case experimental design research on the use of high-tech AAC to teach social-communication skills to individuals with autism spectrum disorder or intellectual disabilities who have complex communication needs, to determine if this intervention approach meets the criteria for evidence-based practices as outlined by the What Works Clearinghouse. Additionally, information on the following extended methodological standards is reported on all included studies: participant description, description of setting and materials, interventionist description, baseline and intervention description, maintenance, generalization, procedural integrity, and social validity. The results from 18 multiple-baseline or multiple-probe experiments across 17 studies indicate that using high-tech AAC to teach social-communication skills to individuals with autism spectrum disorder or intellectual disabilities and complex communication needs can be considered an evidence-based practice, although the review of comparison (i.e., alternating treatment) design studies did not indicate that high-tech AAC is significantly better than low-tech AAC.
>
> Major Point: High tech AAC is evidence-based practice in teaching social-communication skills to individuals with autism spectrum disorder or intellectual disabilities and complex communication needs.

Kent-Walsh, J., & Binger, C. (2018), ***Methodological advances, opportunities, and challenges in AAC research*****, Augmentative and Alternative Communication, 34:2, 93-103 (paywall access here)**

> Abstract: Since its inception in 1985, the AAC journal has been publishing scientific articles related to the field of augmentative and alternative communication (AAC) that (a) report research concerning assessment, treatment, rehabilitation, and education of people who use or have the potential to use AAC systems and (b) cover theory, technology, and systems development relevant to AAC. The journal has maintained a consistent focus on the science and practice of AAC while also advancing in varied and impressive ways. Among the many developments apparent in AAC over the years, methodological advancements emerge as pivotal within the evolution of the science of AAC. This report examines the state of the science in behavioral AAC research with

specific regard to changes and opportunities in research methodology. Illustrations from articles published in Volume 1 (1985) and Volume 32 (2016) of AAC are used in this paper to frame commentary on (a) contextual consideration in conducting AAC research, (b) types of research design, (c) considerations of procedural rigor, and (d) future methodological directions and resources. If the AAC field is to meet the goal of ensuring that all individuals with complex communication needs achieve their full potential, meaningful questions must be posed to address key problems, and rigorous scientific methods must be employed to answer these questions.

Major Point: Provides an overview of the progression of AAC research methodologies dating back to 1985; emphasizes need for continued research to ensure the communication needs of all individuals are met to enable achievement of their full potential

Ganz, J.B., Morin, K.L., Foster, M.J., Vannest, K.J., Tosun, D.G., Gregori, E.V., & Gerow, S.L. (2017), *High-technology augmentative and alternative communication for individuals with intellectual and developmental disabilities and complex communication needs: a meta-analysis*, Augmentative and Alternative Communication, 33:4, 224-238 (paywall access here)

Abstract: The use of mobile technology is ubiquitous in modern society and is rapidly increasing in novel use. The use of mobile devices and software applications ("apps") as augmentative and alternative communication (AAC) is rapidly expanding in the community, and this is also reflected in the research literature. This article reports the social-communication outcome results of a meta-analysis of single-case experimental research on the use of high-tech AAC, including mobile devices, by individuals with intellectual and developmental disabilities, including autism spectrum disorder. Following inclusion determination, and excluding studies with poor design quality, raw data from 24 publications were extracted and included 89 A-B phase contrasts. Tau-U nonparametric, non-overlap effect size was used to aggregate the results across all studies for an omnibus and moderator analyses. Kendall's S was calculated for confidence intervals, p-values, and standard error. The omnibus analysis indicated overall low to moderate positive effects on social-communication outcomes for high-tech AAC use by individuals with intellectual and developmental disabilities.

Major Point: ". . . low to moderate positive effects on social-communication outcomes for high-tech AAC use by individuals with intellectual and developmental disabilities"

Holyfield, C., Drager, K.D.R., Kremkow, J.M.D., & Light, J. (2017), *Systematic review of AAC intervention research for adolescents and adults with autism spectrum disorder*, Augmentative and Alternative Communication, 33:4, 201-212 (paywall access here)

> Abstract: Much of augmentative and alternative communication (AAC) research for individuals with autism spectrum disorder has focused on young children. Given that the lives, communication, strengths, and needs of adolescents and adults with autism spectrum disorder are quite different from those of young children, the purpose of the current study was to consolidate current AAC intervention research findings specific to these individuals. A systematic review was conducted to identify and evaluate relevant research. Results indicate that AAC intervention benefits adolescents and adults with autism spectrum disorder. However, more research is urgently needed. Future research focused on supporting communicative functions other than requesting (e.g., social closeness, information transfer) while participating in contexts important to the lives of adolescents and adults may be particularly valuable.
>
> Major Point: AAC can benefit adolescents and adults with ASD, but more research is needed.

Iacono, T., Trembath, D., & Erickson, S. (2016), *The role of augmentative and alternative communication for children with autism: current status and future trends*, Neuropsychiatric Disease and Treatment, 12: 2349-2361 (open access here)

> Abstract: Augmentative and alternative communication (AAC) interventions are used for children with autism, often as stand-alone communication interventions for those who are minimally verbal. Our aim was to synthesize the evidence for AAC interventions for children (up to 21 years), and then consider the role of AAC within established, comprehensive, evidence-based autism interventions targeting learning across multiple developmental domains. We completed a systematic search of three databases (OVID Medline, PsycINFO, ERIC) as well as forward citation and hand searches to identify systematic reviews of AAC intervention efficacy research including children with autism, published between 2000 and March 2016 in peer-reviewed journals. Data pertaining to the quality indicators of included studies, effect sizes for intervention outcomes, and evidence for effectiveness were extracted for descriptive analysis. The search yielded 17 systematic reviews. Most provided indicators of research quality for included studies, of which only relatively few provided conclusive results. Communication targets tended to be focused on teaching children to make requests. Still, effect size measures for included studies indicated that AAC was effective to highly effective. There is growing evidence for the potential benefits of AAC for children with autism, but there is a need for more well-designed studies and broader, targeted outcomes. Furthermore, a lack of evidence for the role of AAC within comprehensive intervention programs may account

for a tendency by autism researchers and practitioners to neglect this intervention. Attempts to compare evidence for AAC with other interventions for children with autism, including those in which the use of AAC is delayed or excluded in pursuit of speech-only communication, must take into account the needs of children with the most significant learning needs. These children pose the greatest challenges to achieving large and consistent intervention effects, yet stand to gain the most from AAC interventions.

Major Point: Analyzes 17 systematic reviews of the AAC literature and finds very little high quality AAC research on the autistic population, and those with the most significant learning needs. Most AAC research evaluates the effectiveness of requesting methods rather than AAC that enables robust communication. The paper questions the appropriateness of randomized controlled trial studies in assessing the effectiveness of AAC for those with complex communication needs. “The underlying tenets of AAC research are that communication is multimodal and that individuals differ in terms of those modalities that may best suit their learning needs and preferences.”

Brady, N.C., Bruce, S., Goldman, A., Erickson, K., Mineo, B., Ogletree, B.T., Paul, D., Romski, M., Sevcik, R., Siegel, E., Schoonover, J., Snell, M., Sylvester, L., & Wilkinson, K. (2016), *Communication services and supports for individuals with severe disabilities: Guidance for assessment and intervention*, American Journal on Intellectual and Developmental Disabilities, 121:2, 121-138 (open access here)

Abstract: The National Joint Committee for the Communication Needs of People With Severe Disabilities (NJC) reviewed literature regarding practices for people with severe disabilities in order to update guidance provided in documents originally published in 1992. Changes in laws, definitions, and policies that affect communication attainments by persons with severe disabilities are presented, along with guidance regarding assessment and intervention practices. A revised version of the Communication Bill of Rights, a powerful document that describes the communication rights of all individuals, including those with severe disabilities is included in this article. The information contained within this article is intended to be used by professionals, family members, and individuals with severe disabilities to inform and advocate for effective communication services and opportunities.

Major Point: Revises the Communication Bill of Rights

Sennot, S.C., Light, J.C., & McNaughton, D. (2016), *AAC modeling intervention research review*, Research and Practice for Persons with Severe Disabilities, 41: 101-115 (paywall access here)

> Abstract: A systematic review of research on the effects of interventions that include communication partner modeling of aided augmentative and alternative communication (AAC) on the language acquisition of individuals with complex communication needs was conducted. Included studies incorporated AAC modeling as a primary component of the intervention, defined as the communication partners (a) modeling aided AAC as they speak and (b) participating in the context of a naturalistic communication interaction. This review used a best-evidence approach, including nine single-case studies, with 31 participants, and 70 replications, and one quasi-experimental randomized group design study, including 63 participants. The results of the review indicated that AAC modeling intervention packages led to meaningful linguistic gains across four areas including (a) pragmatics, marked by increases in communication turns; (b) semantics, marked by receptive and expressive vocabulary increases; (c) syntax, marked by multi-symbol turn increases; and (d) morphology, marked by increases in target morphology structures.
>
> Major Point: AAC modeling can be an effective means to improve language abilities.

Smith, M. (2016), *Evidence for Impact and Impact of Evidence*, Augmentative and Alternative Communication, 32:4, 227-232 (paywall access here)

> Abstract: The author reflects on the new focus of research in measuring impact of the study to make a difference. She agrees that in research, difficulties are encountered in forging the link between practice and research evidence. An overview of different perspectives about evidence-based practice (EBP), the value of evidence and meaningful research impact is given. The author suggests the need for collaboration in measuring evidence and its impact for structuring interventions to maximize benefits.
>
> Major Point: Points out the value and relevance of a variety of forms of "evidence," specifically in understanding the use of AAC.

Hengst, J., McCartin, M., Valentino, H., Devanga, S., & Sherrill, M. (2016), *Mapping Communicative Activity: A CHAT Approach to Design of Pseudo-Intelligent Mediators for Augmentative and Alternative Communication (AAC)*, Outlines, Critical Practice Studies, 17:1, 5-38 (open access here)

> Abstract: The development of AAC technologies is of critical importance to the many people who are unable to speak intelligibly (or at all) due to a communication disorder, and to their many everyday interlocutors. Advances in digital technologies have

revolutionized AAC, leading to devices that can “speak for” such individuals as aptly as it is illustrated in the case of the world famous physicist, Stephen Hawking. However, given their dependence on prefabricated language (and constant management by teams of people), current AAC devices are very limited in their ability to mediate everyday interactions. We argue here that the limits of AAC are firstly theoretical—grounded in prosthetic models that imagine AAC devices as replacements for damaged body parts and in transmission models of language production as communication. In contrast, our multidisciplinary team aims to design pseudo-intelligent mediators (PIMs) of communication by blending strengths of human mediators with features of current AAC technologies. To inform the design process, we report here our initial situated studies focusing on the distributed nature of everyday communicative activities conducted with potential AAC/PIM users. Our analysis focuses on the discursive alignments of these participants and their interlocutors, attending especially to the various ways their personal aides function as human mediators. Specifically, we focus on mapping the communicative activity around each of these differently-abled individuals (the majority of whom have cerebral palsy) as they navigated a university campus. We profile the everyday interactional patterns within functional systems and across settings, and present close discourse analysis of one interaction to highlight the diverse roles personal aides adopted in mediating communication. Finally, we argue that attending to differently “abled” bodies as they move through everyday communicative environments pushes CHAT to more fully theorize physicality, individual mobilities, and the roles of bodies in the laminated assemblage of functional systems.

Major Point: Describes the many elements of communication and support that go into enabling people with and without disabilities to communicate, characterizing AAC as much more than a device; uses examples of Stephen Hawking and AAC users on a college campus

McNaughton, D., & Light, J. (2015), *What We Write about When We Write About AAC: The Past 30 Years of Research and Future Directions*, Augmentative and Alternative Communication, 31:4, 261-270 (open access here)

Abstract: For the past 30 years, the Augmentative and Alternative Communication (AAC) journal has both documented and instigated change in the field of AAC. We reviewed the papers published in the AAC journal from 1985–2014 in order to identify trends in research and publication activities. Intervention research made up the largest proportion of the four types of research (i.e., intervention, descriptive, experimental, and instrument and measurement development) reported in the journal. Intervention research has most commonly focused on the individual with complex communication needs, and most frequently on younger individuals (aged 17 and younger) with developmental disabilities. While much has been learned in the past 30 years, there continues to be a need for high

quality research in a large number of areas. There is a special need for reports of interventions with older individuals with complex communication needs as a result of acquired disabilities, and for information on effective interventions for the communication partners of persons with complex communication needs.

Major Point: Notes that the field of AAC emerged only in the mid-1980s, and there is very little published research (a) on AAC interventions that allow the user to communicate more than just simple requests, (b) conducted in the natural environment, (c) using natural communication partners rather than researchers themselves, (d) conducted over more than a six-week intervention period, and (e) on adults with complex communication needs

Kent-Walsh, J., Murza, K.A., Malani, M.D., & Binger, C. (2015), *Effects of Communication Partner Instruction on the Communication of Individuals Using AAC: A Meta-Analysis*, Augmentative and Alternative Communication, 31:4, 271-284 (paywall access here)

Abstract: The purpose of this study was to conduct a systematic review and meta-analysis of the augmentative and alternative communication (AAC) partner instruction intervention literature to determine (a) the overall effects of partner interventions on the communication of individuals using AAC, and (b) any possible moderating variables relating to participant, intervention, or outcome characteristics. Seventeen single-case experimental design studies (53 participants) met the inclusion criteria and were advanced to the full coding and analysis phase of the investigation. Descriptive analyses and effect size estimations using the Improvement Rate Difference (IRD) metric were conducted. Overall, communication partner interventions were found to be highly effective across a range of participants using AAC, intervention approaches, and outcome measure characteristics, with more evidence available for participants less than 12 years of age, most of whom had a diagnosis of autism spectrum disorder or intellectual/developmental disability. Aided AAC modeling, expectant delay, and open-ended question asking were the most frequently targeted communication partner interaction skills. Providing a descriptive overview, instructor modeling, guided practice, and role plays were the most frequently incorporated communication partner intervention activities within the included studies.

Major Point: Reviews 17 studies of communication partner interventions, finding such interventions are very important to the communication of individuals who use AAC

Radtke, J.V., Baumann, B.M., Garrett, K.L., & Happ, M.B. (2011), *Listening to the Voiceless Patient: Case Reports in Assisted Communication in the Intensive Care Unit*, Journal of Palliative Medicine, 14:6, 791-795 (open access here)

Abstract: Communication problems experienced by nonspeaking, critically ill patients in the Intensive Care Unit (ICU) have serious implications for the physical and psychological well-being of patients and the quality of their care. These problems are most profound for those with prolonged critical illnesses who are at the highest risk of dying. Recently, speech language pathologist (SLP) services have been used to provide augmentative and alternative communication (AAC) assistance to this vulnerable group of patients, their caregivers, and medical staff. Here we present three clinical cases that illustrate the application of AAC strategies across different levels of illness severity and communication impairment for nonspeaking patients in the ICU. Both high-tech communication devices with voice output and low-tech options were used for each patient according to their motor and cognitive abilities. To accommodate fluctuations in patient status and communication needs, multiple AAC strategies were integrated into the communication repertoire and tailored for each case. Medical personnel involved in these cases attributed enhanced communication efficiency, improved ventilator weaning trials, and increased patient engagement to the AAC techniques. This approach has the potential to improve symptom communication and to ease suffering for seriously ill ICU patients with speech limitations.

Major Point: Advocates using multiple AAC strategies with ICU patients who have difficulty communicating

Flippin, M., Reszka, S., & Watson, L.R. (2010), *Effectiveness of the Picture Exchange Communication System (PECS) on Communication and Speech for Children With Autism Spectrum Disorders: A Meta-Analysis*, American Journal of Speech-Language Pathology, 19:2, 178-195 (open access here)

Abstract: This meta-analysis reviews the current empirical evidence for PECS in affecting communication and speech outcomes for children with ASD. A systematic review of the literature on PECS written between 1994 and June 2009 was conducted. Quality of scientific rigor was assessed and used as an inclusion criterion in computation of effect sizes. Effect sizes were aggregated separately for single-subject and group studies for communication and speech outcomes. Results: Eight single-subject experiments (18 participants) and 3 group studies (95 PECS participants, 65 in other intervention/control) were included. Results indicated that PECS is a promising but not yet established evidence-based intervention for facilitating communication in children with ASD ages 1–11 years. Small to moderate gains in communication were demonstrated following training. Gains in speech were small to negative. Conclusions:

This meta-analysis synthesizes gains in communication and relative lack of gains made in speech across the PECS literature for children with ASD. Concerns about maintenance and generalization are identified. Emerging evidence of potential preintervention child characteristics is discussed. Phase IV was identified as a possibly influential program characteristic for speech outcomes.

Major Point: Finds that PECS is a promising but not yet evidence-based intervention for facilitating communication in children with ASD ages 1 to 11 years

Lasker, J., & Bedrosian, J. (2009), *Promoting acceptance of augmentative and alternative communication by adults with acquired communication disorders*, Augmentative and Alternative Communication, 17:3, 141-153 (paywall access here)

Abstract: This article discusses components of the AAC Acceptance Model, a theoretical framework for understanding the factors involved in the acceptance of augmentative and alternative communication (AAC) by adults with acquired communication disorders. To clarify the AAC Acceptance Model, a case study is provided of an individual with acquired aphasia and apraxia of speech who seemed initially to be an "ideal" candidate for optimal use of AAC. A trial period conducted prior to acquisition of an AAC system included analysis of the client's communication behaviors using an AAC loaner device in conversation with unfamiliar partners in the clinical setting. After a device was acquired, the individual was reluctant to use it in public places with unfamiliar partners. Clinicians employed specific treatment techniques to promote AAC acceptance. Intervention focused on increasing the user's communicative effectiveness and comfort level in community-based interactions. This case study highlights the importance of all three branches of the AAC Acceptance Model (milieu, person, and technology) in the clinical decision-making process. In addition, the case study illustrates the need for appropriate clinical outcome measures for adults with aphasia.

Major Point: Finds that familiar communication partners and settings are important to AAC users' ability to communicate using AAC, even when users are not developmentally disabled but acquired their disability as adults

Gernsbacher, M.A., Morson, E., & Grace, E. (2015), *Language Development in Autism*, Neurobiology of Language, 879-886 (open access here)

Abstract: Abnormal language development used to define autism, but no longer does. Indeed, language development no longer even figures into contemporary diagnostic criteria, although early delays in language often lead to parents' concerns. In this chapter, we review recent empirical research on language development in autism. To paint a contemporary picture, we restrict our review to studies published in the 21st century. We conclude that language development in autism is often delayed, but not deviant; that a delay in language development is not unique to autism; and that language development in autism is remarkably heterogeneous.

Major Point: Reviews empirical research on language development in autism, concludes that language delay is not a necessary feature of autism, and supports the idea that speech delay is not the same thing as language delay

Mirenda, P. (2008), *A Back Door Approach to Autism and AAC*, Augmentative and Alternative Communication, 24:3, 220-234 (paywall access here)

Abstract: The conventional view is that most individuals with autism or pervasive developmental disorder-not otherwise specified (PDD-NOS) have no significant motor impairments but do have severe intellectual disabilities. These assumptions impact the nature and types of augmentative and alternative communication (AAC) interventions that are typically provided, which tend to be narrowly focused on basic, functional communication skills such as requesting. However, recent research has provided evidence that challenges these assumptions and suggests the potential of intervention approaches targeting motor, language, and literacy development. The author encourages practitioners and researchers to examine current assumptions about autism and to invent and investigate new ways to support people with autism to communicate.

Major Point: Advocates for new ways to support people with autism to communicate

Kent-Walsh, J., & McNaughton, D. (2005), *Communication Partner Instruction in AAC: Present Practices and Future Directions*, Augmentative and Alternative Communication, 21:3, 195-204 (open access here)

Abstract: The success of communicative interaction is dependent on the communication skills of each individual participating in the exchange. Accordingly, in the case of an interaction involving an individual using augmentative and alternative communication (AAC), the success of the interaction depends not only on the skills of this individual, but also on those of the communication partner. Current literature indicates that communication partner instruction is a critical intervention component. Furthermore, there is evidence that, with instruction, communication partners can learn to use facilitative interaction skills and strategies to better support the communication of individuals using AAC. To date, however, little attention has been paid to the most effective and efficient instructional methods for communication partner intervention programs. Therefore, in this paper, we propose an eight-step strategic model for use in communication partner instruction programs, and identify future research directions related to this model.

Major Point: Discusses the importance of skilled and well-trained communication partners in interactions between individuals with complex communication needs who use AAC and others. Notes that little attention has been paid to communication partner instruction and proposes avenues for more research and focus in this important aspect of AAC.

Gernsbacher, M.A. (2004), *Language is More than Speech: A Case Study*, The Journal of Developmental and Learning Disorders, 8: 79-96 (open access here)

Abstract: Some individuals face severe challenges with producing oral language (i.e., speech). In this article a case study of a child who experienced severe challenges with speech development is presented. Medical records, historical home videos, audio recordings, and photographs, in conjunction with an extensive journal maintained by the child's mother provide the basis for this report, which profiles the child's development from birth to age 8;0. This child's development demonstrates the necessity of distinguishing between language—the mental representation of concepts and their relations—and speech—one means for communicating mental representations.

Major Point: Powerful case study drawing from detailed records kept by mother of individual who communicates by spelling, demonstrating that lack of speech cannot be assumed to mean lack of language or intelligence

Wu, Y., & Voda, J. (1985), *User-Friendly Communication Board for Nonverbal, Severely Physically Disabled Individuals*, Archives of Physical Medicine and Rehabilitation, 66:12, 827-828 (open access here)

Abstract: The inability to communicate personal needs, feelings, and ideas is a frustrating barrier for nonverbal patients with severe physical disabilities. It hampers the physician-patient relationship and medical services. This problem has been diminished with the use of a new communication board for patients with brain stem involvement. The communication board display is comprised of 36 squares in a 6 X 6 matrix. The alphabet is arranged in this matrix according to the normal sequence, and each row begins with a vowel. Selection of a desired alphabet letter is done by naming the vowels vertically until the appropriate row is reached, then the individual consonants horizontally until the proper one is indicated by the patient. With this new arrangement, the patient, attendant, or staff can memorize and functionally use the new communication board in a few minutes.

Major Point: An article by a physician and speech-language pathologist from 1985 describing how patients, staff, and caregivers can use letterboards to help individuals with disabilities to communicate

IV. Autism-Specific Literature

Cooper, R.A., & Simons, J.S. (2018), *Exploring the neurocognitive basis of episodic recollection in autism*, Psychonomic Bulletin Review, 1-19 (open access here)

Abstract: Increasing evidence indicates that the subjective experience of recollection is diminished in autism spectrum disorder (ASD) compared to neurotypical individuals. The neurocognitive basis of this difference in how past events are re-experienced has been debated and various theoretical accounts have been proposed to date. Although each existing theory may capture particular features of memory in ASD, recent research questions whether any of these explanations are alone sufficient or indeed fully supported. This review first briefly considers the cognitive neuroscience of how episodic recollection operates in the neurotypical population, informing predictions about the encoding and retrieval mechanisms that might function atypically in ASD. We then review existing research on recollection in ASD, which has often not distinguished between different theoretical explanations. Recent evidence suggests a distinct difficulty engaging recollective retrieval processes, specifically the ability to consciously reconstruct and monitor a past experience, which is likely underpinned by altered functional interactions between neurocognitive systems rather than brain region-specific or process-specific dysfunction. This integrative approach serves to highlight how memory research in ASD may enhance our understanding of memory processes and networks in the typical brain. We make suggestions for future research that are important for further specifying the neurocognitive basis of episodic recollection in ASD and linking such difficulties to social developmental and educational outcomes.

Major Point: Observes substantial differences in episodic memory between autistic and neurotypical individuals; provides a theoretical basis for why subjecting autistic students of FC and RPM to tests that rely on perception and memory and querying them about their past may be inappropriate

Jaswal, V., & Akhtar, N. (2018), *Being vs. Appearing Socially Uninterested: Challenging Assumptions about Social Motivation in Autism*, Behavioral and Brain Sciences, 1-84 (paywall access here)

Abstract: Progress in psychological science can be limited by a number of factors, not least of which are the starting assumptions of scientists themselves. We believe that some influential accounts of autism rest on a questionable assumption that many of its behavioral characteristics indicate a lack of social interest—an assumption that is flatly contradicted by the testimony of many autistic people themselves. In this paper, we challenge this assumption by describing alternative explanations for four such behaviors: (a) low levels of eye contact, (b) infrequent pointing, (c) motor stereotypies, and (d) echolalia. The assumption that autistic people's unusual behaviors indicate diminished social motivation has had profound and often negative effects on the ways they are studied and treated. We argue that understanding and supporting autistic individuals will require interrogating this assumption, taking autistic testimony seriously, considering alternative explanations for unusual behaviors, and investigating unconventional—even idiosyncratic—ways that autistic individuals may express their social interest. These steps are crucial, we believe, for creating a more accurate, humane, and useful science of autism.

Major Point: Argues that the conventional wisdom that infers social motivation from stereotypically autistic behaviors needs to be questioned

Friedner, M., & Block, P. (2017), *Deaf studies meets autistic studies*, The Senses and Society, 12:3, 282-300 (paywall access here)

Abstract: What might deaf studies and autistic studies have in common? Why, in many cases, is deafness considered to be a norm to be analyzed through linguistic and cultural frameworks, while autism is (still) seen as pathological? Utilizing ethnographic research, participation in two conferences on autism and sign language, and an analysis of deaf peoples' and autistic peoples' self-(re)presentation, we attend to sensory solidarities that might exist between deaf and autistic people, communities, and studies. We argue that an analysis of the two fields side-by-side offers important insights into new ways of conceptualizing sociality, identity, and community both in the specific cases of deafness and autism, and more broadly. Additionally, attending to deaf and autistic peoples' language and communication desires and practices opens up analytic and empirical space for considering interdependent and multimodal communicative approaches.

Major Point: Draws parallels between communicative and cultural components of individuals who identify as Deaf and Autistic, arguing that Deaf studies offers a new frame to interpret autism not as pathology but as a linguistic and cultural minority group

Subramanian, K., Brandenburg, C., Orsati, F., Soghomonian, J.J., Hussman, J.P., & Blatt, G.J. (2017), *Basal Ganglia and Autism – A Translational Perspective*, Autism Research, 10:11, 1751-1775 (paywall access here)

> Abstract: In typically developing individuals, the basal ganglia plays an important role in: eye movement, movement coordination, sensory modulation and processing, eye-hand coordination, action chaining, and inhibition control. Genetic models have proved to be useful toward understanding cellular and molecular changes at the synaptic level in the basal ganglia that may in part contribute to these autism-related behaviors. In autism, basal ganglia functions in motor skill acquisition and development are altered, thus disrupting the normal flow of feedback to the cortex. Habit learning, action selection and performance are modulated by the basal ganglia, a collection of groups of neurons located below the cerebral cortex in the brain. In autism, there is emerging evidence that parts of the basal ganglia are structurally and functionally altered disrupting normal information flow. The basal ganglia through its interconnected circuits with the cerebral cortex and the cerebellum can potentially impact various motor and cognitive functions in the autism brain.
>
> Major Point: Neuroscience research providing further support for the existence of motoric differences in the autistic population

Torres, E.B., & Denisova, K. (2016), *Motor Noise is Rich Signal in Autism Research and Pharmacological Treatments*, Scientific Reports, 6, Article number: 37422 (open access here)

> Abstract: The human body is in constant motion, from every breath that we take, to every visibly purposeful action that we perform. Remaining completely still on command is a major achievement as involuntary fluctuations in our motions are difficult to keep under control. Here we examine the noise-to-signal ratio of micro-movements present in time-series of head motions extracted from resting-state functional magnetic resonance imaging scans in 1048 participants. These included individuals with autism spectrum disorders (ASD) and healthy-controls in shared data from the Autism Brain Imaging Data Exchange (ABIDE) and the Attention-Deficit Hyperactivity Disorder (ADHD-200) databases. We find excess noise and randomness in the ASD cases, suggesting an uncertain motor-feedback signal. A power-law emerged describing an orderly relation between the dispersion and shape of the probability distribution functions best describing the stochastic properties under consideration with respect to intelligence quotient (IQ-scores). In ASD, deleterious patterns of noise are consistently exacerbated with the presence of secondary (comorbid) neuropsychiatric diagnoses, lower verbal and performance intelligence, and autism severity. Importantly, such patterns in ASD are present whether or not the participant takes psychotropic medication. These data

unambiguously establish specific noise-to-signal levels of head micro-movements as a biologically informed core feature of ASD.

Major Point: Finds excess noise and randomness in fMRI scans of autistic participants

Bal, V.H., Katz, T., Bishop, S.L., & Krasileva, K. (2016), *Understanding definitions of minimally verbal across instruments: Evidence for subgroups within minimally verbal children and adolescents with autism spectrum disorder*, Journal of Child Psychology and Psychiatry, 57:12, 1424-1433 (paywall access here)

Abstract: Minimally verbal (MV) children with autism spectrum disorder (ASD) are often assumed to be profoundly cognitively impaired and excluded from analyses due to challenges completing standardized testing protocols. A literature aimed at increasing understanding of this subgroup is emerging; however, the many methods used to define MV status make it difficult to compare studies. Understanding how different instruments and definitions used to identify MV children affect sample composition is critical to advance research on this understudied clinical population. The MV status of 1,470 school-aged children was defined using five instruments commonly used in ASD research. MV sample composition was compared across instruments. Analyses examined the proportion of overlap across MV subgroups and the extent to which child characteristics varied across MV subgroups defined using different definitions or combinations of measures. A total of 257 children were classified as MV on at least one instrument. Proportion of overlap between definitions ranged from 3% to 100%. The stringency of definition (i.e. few-to-no vs. some words) was associated with differences in cognitive and adaptive functioning; more stringent definitions yielded greater consistency of MV status across instruments. Cognitive abilities ranged from profoundly impaired to average intelligence; 16% had NVIQ ≥ 70. Approximately half exhibited verbal skills commensurate with nonverbal cognitive ability, whereas half had verbal abilities significantly lower than their estimated NVIQ. Future studies of MV children must carefully consider the methods used to identify their sample, acknowledging that definitions including children with ‘some words’ may yield larger samples with a wider range of language and cognitive abilities. Broadly defined MV samples may be particularly important to delineate factors interfering with language development in the subgroup of children whose expressive impairments are considerably below their estimated nonverbal cognitive abilities.

Major Point: Posits the existence of subgroups among minimally verbal autistic individuals, while noting the difficulty of reliably assessing cognitive ability in this population

Focaroli, V., Taffoni, F., Parsons, S.M., Keller, F., & Iverson, J.M. (2016), ***Performance of Motor Sequences in Children at Heightened vs. Low Risk for ASD: A Longitudinal Study from 18 to 36 Months of Age*****, Frontiers in Psychology, 7:724 (open access here)**

> Abstract: Recent research shows that motor difficulties are a prominent component of the behavioral profile of autism spectrum disorder (ASD) and are also apparent from early in development in infants who have an older sibling with ASD (High Risk; HR). Delays have been reported for HR infants who do and who do not receive an eventual diagnosis of ASD. A growing body of prospective studies has focused on the emergence of early motor skills primarily during the first year of life. To date, however, relatively little work has examined motor skills in the second and third years. Thus, the present research was designed to investigate motor performance in object transport tasks longitudinally in HR and LR (Low Risk) children between the ages of 18 and 36 months. Participants (15 HR children and 14 LR children) were observed at 18, 24, and 36 months. Children completed two motor tasks, the Ball Task and the Block Task, each of which included two conditions that varied in terms of the precision demands of the goal action. Kinematic data were acquired via two magneto inertial sensors worn on each wrist. In the Block Task, HR children reached more slowly (i.e., mean acceleration was lower) compared to LR children. This finding is in line with growing evidence of early delays in fine motor skills in HR children and suggests that vulnerabilities in motor performance may persist into the preschool years in children at risk for ASD.
>
> Major Point: Finds that children at high risk of a later ASD diagnosis experience persistent fine motor delays between the ages of 18 and 36 months; provides further evidence of a motor component to autism

Robledo, J., & Donnellan, A.M. (2016), ***Supportive Relationships in Autism Spectrum Disorder: Perspectives of Individuals with ASD and Supporters*****, Behavioral Sciences, 6:4, 23 (open access here)**

> Abstract: This study explored 17 dyads of academically successful people with Autism Spectrum Disorder (ASD) and individuals who they identified as supportive. Qualitative methods, including in-depth interviews, participant observations, and document analysis, were used to study these supportive relationships. The purpose of the study was to develop a substantive grounded theory regarding supportive relationships within the lives of individuals with ASD. A dynamic model of supportive relationships emerged, with trust, unity, and support as the three core categories of these relationships. The data suggest that the quality of the relationship between an individual with ASD and the support provider can be a critical factor within effective support. These findings suggest that there is much yet to be learned about the social world of individuals with ASD.

Major Point: “. . . the quality of the relationship between an individual with ASD and the support provider can be a critical factor within effective support.”

Tierney, C., Mayes, S., Lohs, S.R., Black, A., Gisin, E., & Veglia, M. (2015), ***How Valid Is the Checklist for Autism Spectrum Disorder When a Child Has Apraxia of Speech?*** **Journal of Developmental & Behavioral Pediatrics, 36:8, 569-74 (paywall access here)**

Abstract: Our objective was to determine if the Checklist for Autism Spectrum Disorder (CASD) was inadvertently overemphasizing autism symptoms in a population of children without autism. Children noted with communication delays were referred to both a developmental pediatrician and a speech and language pathologist for an apraxia and autism evaluation. All children who underwent both autism and apraxia evaluations and met rule-in or rule-out criteria for both diagnoses were included in the study, resulting in a sample size of 30. Our results show that 63.6% of children initially diagnosed with autism also had apraxia, 36.8% of children initially diagnosed with apraxia also had autism, 23.3% had neither, and 23.3% had both. Overall diagnostic accuracy for the CASD was 96.7%. Overall accuracy for the CASD for children without apraxia was 100% and accuracy for children with apraxia was 94.7%. Specificity for the CASD was 100%, while sensitivity was 90.9%. The PPV was 100% and the NPV was 95.0%. This study demonstrates that the CASD does not overemphasize autism symptoms in a population of children without autism. It also shows that autism and apraxia are highly comorbid. Thus, it is important to monitor all children diagnosed with apraxia for signs of autism and all children diagnosed with autism for signs of apraxia. This will help identify children as early as possible and allow them access to services appropriate to their needs.

Major Point: Finds that autism and apraxia are highly co-morbid: 64% of children diagnosed with autism also have apraxia

Courchesne, V., Meilleur, A.-A.S., Poulin-Lord, M.-P., Dawson, M., & Soulières, I. (2015), ***Autistic children at risk of being underestimated: school-based pilot study of a strength-informed assessment*****, Molecular Autism, 6:12 (open access here)**

Abstract: An important minority of school-aged autistic children, often characterized as ‘nonverbal’ or ‘minimally verbal,’ displays little or no spoken language. These children are at risk of being judged ‘low-functioning’ or ‘untestable’ via conventional cognitive testing practices. One neglected avenue for assessing autistic children so situated is to engage current knowledge of autistic cognitive strengths. Our aim was thus to pilot a strength-informed assessment of autistic children whose poor performance on conventional instruments suggests their cognitive potential is very limited. Thirty autistic children (6 to 12 years) with little or no spoken language, attending specialized schools for autistic children with the highest levels of impairment, were assessed using Wechsler

Intelligence Scale for Children (WISC-IV), Raven's Colored Progressive Matrices board form (RCPM), Children's Embedded Figures Test (CEFT), and a visual search task. An age-matched control group of 27 typical children was also assessed. None of the autistic children could complete WISC-IV; only six completed any subtest. In contrast, 26 autistic children could complete RCPM, with 17 scoring between the 5th and 90th percentile. Twenty-seven autistic children completed the visual search task, while 26 completed CEFT, on which autistic children were faster than RCPM-matched typical children. Autistic performance on RCPM, CEFT, and visual search were correlated. These results indicate that 'minimally verbal' or 'nonverbal' school-aged autistic children may be at risk of being underestimated: they may be wrongly regarded as having little cognitive potential. Our findings support the usefulness of strength-informed approaches to autism and have important implications for the assessment and education of autistic children.

Major Point: Important study showing that non-speaking autistics cannot be assumed to be intellectually disabled

Torres, E.B., & Donnellan, A.M., eds., *Autism: The Movement Perspective* (2013-2015), Frontiers in Integrative Neuroscience (open access here)

Major Point: A compilation of 38 peer-reviewed articles published by 91 authors between 2013 and 2015 that support the idea that movement and sensory differences are core features of autism.

Libertus, K., Sheperd, K.A., Ross, S.W., & Landa, R.J. (2014), *Limited Fine Motor and Grasping Skills in Six-month-old Infants at High Risk for Autism*, Child Development, 85:6, 2218-2231 (open access here)

Abstract: Atypical motor behaviors are common among children with Autism Spectrum Disorders (ASD). However, little is known about onset and functional implications of differences in early motor development among infants later diagnosed with ASD. Two prospective experiments were conducted to investigate motor skills among six-month-olds at increased risk (high-risk) for ASD (N1 = 129; N2 = 46). Infants were assessed using the Mullen Scales of Early Learning (MSEL) and during toy play. Across both experiments, high-risk infants exhibited less mature object manipulation in a highly structured (MSEL) context and reduced grasping activity in an unstructured (free play) context than infants with no family history of ASD. Longitudinal assessments suggest that between six and ten months, grasping activity increases in high-risk infants.

Major Point: Study systematically comparing fine motor skills of six-month-olds at high versus low risk of a later ASD diagnosis and finding those at higher risk experienced more delays in fine motor skills; provides further evidence that ASD has a motor component

Torres, E.B., Brincker, M., Isenhower, R.W., Yanovich, P., Stigler, K.A., Nurnberger, J.I., Metaxas, D.N., & José, J.V. (2013), *Autism: the micro-movement perspective*, Frontiers in Integrative Neuroscience, 7:32 (open access here)

Abstract: The current assessment of behaviors in the inventories to diagnose autism spectrum disorders (ASD) focus on observation and discrete categorizations. Behaviors require movements, yet measurements of physical movements are seldom included. Their inclusion however, could provide an objective characterization of behavior to help unveil interactions between the peripheral and the central nervous systems (CNSs). Such interactions are critical for the development and maintenance of spontaneous autonomy, self-regulation, and voluntary control. At present, current approaches cannot deal with the heterogeneous, dynamic and stochastic nature of development. Accordingly, they leave no avenues for real time or longitudinal assessments of *change* in a coping system continuously adapting and developing compensatory mechanisms. We offer a new unifying statistical framework to reveal re-afferent kinesthetic features of the *individual* with ASD. The new methodology is based on the non-stationary stochastic patterns of minute fluctuations (micro-movements) inherent to our natural actions. Such patterns of behavioral variability provide re-entrant sensory feedback contributing to the autonomous regulation and coordination of the motor output. From an early age, this feedback supports centrally driven volitional control and fluid, flexible transitions between intentional and spontaneous behaviors. We show that in ASD there is a disruption in the maturation of this form of proprioception. Despite this disturbance, each individual has unique adaptive compensatory capabilities that we can unveil and exploit to evoke faster and more accurate decisions. Measuring the kinesthetic re-afference in tandem with stimuli variations we can detect changes in their micro-movements indicative of a more predictive and reliable kinesthetic percept. Our methods address the heterogeneity of ASD with a personalized approach grounded in the inherent sensory-motor abilities that the individual has already developed.

Major Point: Provides further evidence of sensory-motor differences among autistic individuals

McCleery, J., Elliott, N., Sampanis, D., & Stefanidou, C. (2013), *Motor development and motor resonance difficulties in autism: relevance to early intervention for language and communication skills*, Frontiers in Integrative Neuroscience, 7: 1-20 (open access here)

Abstract: Research suggests that a sub-set of children with autism experience notable difficulties and delays in motor skills development, and that a large percentage of children with autism experience deficits in motor resonance. These motor-related deficiencies, which evidence suggests are present from a very early age, are likely to negatively affect social-communicative and language development in this population. Here, we review evidence for delayed, impaired, and atypical motor development in infants and children with autism. We then carefully review and examine the current language and communication-based intervention research that is relevant to motor and motor resonance (i.e., neural “mirroring” mechanisms activated when we observe the actions of others) deficits in children with autism. Finally, we describe research needs and future directions and developments for early interventions aimed at addressing the speech/language and social-communication development difficulties in autism from a motor-related perspective.

Major Point: Reviews the evidence of delayed, impaired, and atypical motor development in autism

Tager-Flusberg, H., & Kasari, C. (2013), ***Minimally Verbal School-Aged Children with Autism Spectrum Disorder: The Neglected End of the Spectrum*****, Autism Research: Official Journal of the International Society for Autism Research, 6:6 (open access here)**

Abstract: It is currently estimated that about 30% of children with autism spectrum disorder remain minimally verbal, even after receiving years of interventions and a range of educational opportunities. Very little is known about the individuals at this end of the autism spectrum; in part because this is a highly variable population with no single set of defining characteristics or patterns of skills or deficits, and in part because it is extremely challenging to provide reliable or valid assessments of their developmental functioning. In this paper we summarize current knowledge based on research including minimally verbal children. We review promising new novel methods for assessing the verbal and nonverbal abilities of minimally verbal school-aged children, including eye-tracking and brain imaging methods that do not require overt responses. We then review what is known about interventions that may be effective in improving language and communication skills, including discussion of both non-augmentative and augmentative methods. In the final section of the paper we discuss the gaps in the literature and needs for future research.

Major Point: Finds that even though approximately one-third of autistic children are minimally verbal, even after receiving years of interventions and a range of educational opportunities, almost all research focuses on *verbal* children; suggests autism research therefore cannot necessarily be assumed to apply to the minimally verbal. Observes that the non-verbal/minimally-verbal autistic population is itself highly heterogeneous, and the causes of and solutions for the inability to speak cannot be generalized. Finds almost no evidence for effective AAC or language interventions in the minimally verbal ASD population; notes no data exists to support the use of PECS or iPad-based AAC applications beyond a requesting function. Provides suggestions for further research.

Savarese, R.J. (2013), *Moving the field: the sensorimotor perspective on autism* (Commentary on “Rethinking autism: implications of sensory and motor differences,” an article by Anne Donnellan, David Hill, and Martha Leary), Frontiers in Integrative Neuroscience, 7:6 (open access here)

Abstract: Since the article’s initial publication in *Disability Studies Quarterly*, the sensorimotor hypothesis has garnered even more support (Donnellan et al., 2010). For example, a meta-analysis from 2010 concluded, “ASD is associated with significant and widespread alterations in motor performance” (Fournier et al., 2010). The article went so far as to propose that motor differences constitute a “core element” of autism and that “interventions aimed at improving … motor coordination (i.e., gait and balance, arm functions, and movement planning)” should be considered. A study from 2011 found that gross and fine motor differences in autistic children increased significantly with “each 6-month period of chronological age” (Lloyd et al., 2011). It recommended “addressing motor development in early intervention treatments.” And a study from 2012 reported that “motor skills were substantially impaired among ASD-affected children and highly correlated with autistic severity and IQ” (Hilton et al., 2012). By looking at the siblings of autistic children and finding in them no equivalent impairment, the study was able to directly link sensorimotor disturbances with ASD. It, too, contended that motor impairment is a “core characteristic” of autism and that treatment should reflect this fact. The tide has clearly shifted with respect to the sensorimotor hypothesis; what was once dismissed out of hand by an earlier generation of autism researchers is now increasingly being taken up for its superior explanatory power.

Major Point: Responds in support of Donnellan et al.’s call for “rethinking autism” and argues that sensorimotor differences are core components of autism experiences

Donnellan, A.M., Hill, D.A., & Leary, M.R. (2013), *Rethinking autism: implications of sensory and movement differences for understanding and support*, Frontiers in Integrative Neuroscience, 6:124 (open access here)

Abstract: For decades autism has been defined as a triad of deficits in social interaction, communication, and imaginative play. Though there is now broad acknowledgment of the neurological basis of autism, there is little attention paid to the contribution of such neurological differences to a person’s development and functioning. Communication, relationship, and participation require neurological systems to coordinate and synchronize the organization and regulation of sensory information and movement. Developmental differences in these abilities are likely to result in differences in the way a person behaves and expresses intention and meaning. The present paper shares our emerging awareness that people may struggle with difficulties that are not immediately evident to an outsider. This paper explores the symptoms of sensory and movement differences and the possible implications for autistic people. It provides a review of the history and literature that describes the neurological basis for many of the so-called behavioral differences that people experience. The paper emphasizes the importance of our acknowledgment that a social interpretation of differences in behavior, relationship, and communication can lead us far away from the lived experience of individuals with the autism label and those who support them. We suggest alternative ways to address the challenges faced by people with autism.

Major Point: Explores sensory-motor differences in autism; makes case for a revised understanding of autism that focuses on the perspectives of autistic individuals

Robledo, J., Donnellan, A.M., & Strandt-Conroy, K. (2012), *An exploration of sensory and movement differences from the perspective of individuals with autism*, Frontiers in Integrative Neuroscience, 6:107 (open access here)

Abstract: Parents, teachers, and people who themselves experience sensory and movement differences have consistently reported disturbances of sensation and movement associated with autism. Our review of the literature has revealed both historical and recent references to and research about sensory and movement difference characteristics and symptoms for individuals with autism. What is notably infrequent in this literature, however, is research that highlights the perspective of the individual with autism. If we wish to truly understand the experience of sensory and movement differences for individuals with autism, we must explore their experiences and perspectives. This study presents a qualitative analysis of more than 40 h in-depth inquiry into the lives of five individuals with the autism label. Data were sorted into six categories: perception, action, posture, emotion, communication, and cognition. The insights into sensory and movement differences and autism offered by these individuals was illuminating. We found that the data strongly supported the presence of disruption of organization and regulation of sensory and movement differences in the lived experience of these participants with autism. The present data suggests that in autism this disruption of organization and regulation is amplified in terms of quantity, quality, intensity, and may affect everyday life. These data contribute to a more expansive view of autism that incorporates the possibility that autism is a disorder that affects motor planning, behavior, communication, the sensory motor system, and the dynamic interaction of all of these.

Major Point: Supports the existence of differences in sensory perception and movement in autistic individuals in study involving in-depth interviews and interactions with five autistic individuals

Donnellan, A.M., Hill, D., & Leary, M.R. (2010), ***Rethinking Autism: Implications of Sensory and Movement Differences*****, Disability Studies Quarterly, 30:1 (open access here)**

> Abstract: Descriptions of autism in the Diagnostic and Statistical Manuals of the APA and throughout much of the history of autism emphasize difficulties in social interaction, communication and imaginative play. Recent reports by self-advocates, neuroscientists and other researchers suggest that sensory and movement differences may play a significant part in the lives of those who live with autism. Sensory and movement differences may include difficulties in starting, stopping, continuing, combining and switching motor action, speech, thought, memory and emotion. A review of these reports, the experience of those with other movement differences, and implications for understanding individuals with autism are presented. Suggestions are included on how knowledge of sensory and movement differences may offer guidance in rethinking assumptions about autism characteristics, social interactions, communication and other supports.
>
> Major Point: Emphasizes sensory and movement differences in autism

Fournier, K.A., Hass, C.J., Naik, S.K., Lodha, N., & Cauraugh, J.H. (2010), ***Motor coordination in autism spectrum disorders: a synthesis and meta-analysis*****, Journal of Autism and Developmental Disorders, 40: 1227-1240 (paywall access here)**

> Abstract: Are motor coordination deficits an underlying cardinal feature of Autism Spectrum Disorders (ASD)? Database searches identified 83 ASD studies focused on motor coordination, arm movements, gait, or postural stability deficits. Data extraction involved between-group comparisons for ASD and typically developing controls (N = 51). Rigorous meta-analysis techniques including random effects models, forest and funnel plots, I (2), publication bias, fail-safe analysis, and moderator variable analyses determined a significant standardized mean difference effect equal to 1.20 (SE = 0.144; p <0.0001; Z = 10.49). This large effect indicated substantial motor coordination deficits in the ASD groups across a wide range of behaviors. The current overall findings portray motor coordination deficits as pervasive across diagnoses, thus, a cardinal feature of ASD.
>
> Major Point: Meta-analysis of 83 studies demonstrating overwhelming evidence for existence of motor coordination difficulties in autistic individuals

Broderick, A., & Ne'eman, A. (2008), ***Autism as metaphor: Narrative and counternarrative*****, International Journal of Inclusive Education, 12:5-6, 459-476 (paywall access here)**

> Abstract: In this paper we explore the significance of metaphor and dominant cultural narratives in current autism discourse. We briefly explore the history of metaphor in autism discourse, and outline the contemporary struggle between the culturally dominant metaphor of autism as disease and the emergent counter-narrative of autism within neurodiversity. We argue that metaphor serves very specific purposes in autism discourse, including (1) to create a commonsensical narrative congruence between common understandings of autism and currently dominant notions about its aetiology(ies) or causes(s), and (2) to create a commonsensical narrative congruence between common understandings of autism and currently dominant notions about appropriate responses to or interventions for autism. We argue that the bulk of the support for metaphorically framing autism within a disease model comes from within the non-autistic ('neurotypical' or 'NT') community, whereas the bulk of the support for metaphorically framing autism within a neurodiversity model comes from within the autistic community (and is inclusive of some non-autistic allies as well). In exploring these competing cultural narratives, we argue for the crucial import that counter-narrative can play in the process of cultural critique and resistance to ideological hegemony.
>
> Major Point: Argues that the dominant discourse of autism as metaphor for disease creates misunderstandings about the causes of and best interventions for autism

Dawson, M., Soulières, I., Gernsbacher, M.A., & Mottron, L. (2007), ***The Level and Nature of Autistic Intelligence*****, Psychological Science, 18:8, 657-662 (open access here)**

> Abstract: Autistics are presumed to be characterized by cognitive impairment, and their cognitive strengths (e.g., in Block Design performance) are frequently interpreted as low-level by-products of high-level deficits, not as direct manifestations of intelligence. Recent attempts to identify the neuroanatomical and neurofunctional signature of autism have been positioned on this universal, but untested, assumption. We therefore assessed a broad sample of 38 autistic children on the preeminent test of fluid intelligence, Raven's Progressive Matrices. Their scores were, on average, 30 percentile points, and in some cases more than 70 percentile points, higher than their scores on the Wechsler scales of intelligence. Typically developing control children showed no such discrepancy, and a similar contrast was observed when a sample of autistic adults was compared with a sample of nonautistic adults. We conclude that intelligence has been underestimated in autistics.

Major Point: Finds that autistic participants tended to score much higher on the Raven's than the Wechsler (see also Courchesne et al., 2015)

Bara, B.G., Bucciarelli, M., & Colle, L. (2001), *Communicative abilities in autism: Evidence for attentional deficits*, Brain and Language, 77: 216-240 (paywall access here)

Abstract: Although there are many theories about autism, something all of them agree upon is that autistics are impaired in the ability to communicate. The explanation is either their incapacity to attribute mental states to others or the interference of irrelevant stimuli with the access and processing of the communication (low). Our study on mute autistic children aims to investigate their communicative ability in order to bring some new evidence on the debate. We used an experimental technique that allows autistic children to access and process the communicative acts in a familiar context for as long as needed. The experimental results show that our sample of autistic children performs as well as the control group of normal children in dealing with directs, indirects, ironies, deceits, and recoveries of failure. Independent of their respective difficulty, the felicitous outcome of any of these acts requires the capacity to attribute an adequate communicative intention to the actor. Moreover, our results show that, contrary to the established findings in the literature, autistics' performance in the standard false belief task, a task that requires one to understand the mental states of other people, is equivalent to the performance of normal subjects. We argue that an attentional deficit affects the communicative performance of autistics in experiments where classic methodologies are used; with the proper methodology, we can access the unexplored world where mute autistic children also communicate. As far as we know, this is the first systematic experiment on pragmatic abilities in mute autistic children. Indeed, our work shows that tests and methodologies which help to focus on the communicative task improve the autistics' performance with respect to those used in the literature. We conclude that the autistic communicative deficit is at the performance level and that it has an attentional nature.

Major Point: Finds that, given the right supports and environment, non-speaking autistics are able to communicate as effectively as non-autistics; argues that attentional deficits contribute to communication impairments in autistics

Bristol, M.M., Cohen, D.J., Costello, E.J., Denckla, M., Eckberg, T.J., Kallen R., Kraemer, H.C., Lord, C., Maurer, R., McIlvane, W.J., Minshew, N., Sigman, M., & Spence, M.A. (1996), *State of the science in autism: Report to the National Institutes of Health*, Journal of Autism and Developmental Disorders, 26:2, 121-154 (paywall access here)

Abstract: (none)

Major Point: Many individuals with autism lack speech and have limitations in gestural communication and in the use of augmentative communication systems. These problem areas may be caused or complicated by specific sensory difficulties and/or general motor or more specific motor/speech impairment.

Leary, M.R., & Hill, D. (1996), *Moving on: autism and movement disturbance*, Mental Retardation, 34: 39-53 (open access here)

Abstract: Many authors have reported on the presence of movement disturbance symptoms in some individuals with autism. Typically, these symptoms have been seen as peripheral to autism or as belonging to a co-occurring syndrome. Some have dismissed these symptoms as having no apparent impact on the presence of behaviors defined as the core characteristics of autism. In this article we considered the relation between symptoms of movement disturbance and symptoms of autism and included our speculative and exploratory analyses of shared symptoms. The analyses point out the difficulties posed by current definitions of autism. We proposed that symptoms of movement disturbance can affect a person's experience of life and how he or she may be perceived by others.

Major Point: Early study arguing for reframing autism from a movement perspective

V. Literature on Presuming Competence; Qualitative Studies on Experience

Bacon, J., Orsati, F.T., Floyd, S., & Khater, H. (2017), *"Friends give meaning to life": Reframing friendship for individuals with autism who type to communicate*, Review of Disability Studies Journal, 13:3, 1-19 (paywall access here)

Abstract: We, two able-bodied authors and two authors with autism, use a disability studies framework to understand our experiences of friendship. Taken from a series of recorded conversations over the course of a year, this project describes the development, maintenance, and complications related to our experiences with friendship, including: reframing of friendships, respect for communication, facilitator roles and support, interdependence and reciprocity, and permanency in relationships.

Major Point: Study describing friendships between individuals who communicate differently and require different levels of communication support

Harrison, A.H., & Connolly, J.F. (2013), ***Finding a way in: A review and practical evaluation of fMRI and EEG for detection and assessment in disorders of consciousness,*** **Neuroscience and Biobehavioral Reviews, 37:8, 1403-1419 (open access here)**

> Abstract: Diagnoses and assessments of cognitive function in disorders of consciousness (DOC) are notoriously prone to error due to their reliance on behavioural measures. As a result, researchers have turned to functional neuroimaging and electrophysiological techniques with the goal of developing more effective methods of detecting awareness and assessing cognition in these patients. This article reviews functional magnetic resonance imaging (fMRI) and electroenchphalography (EEG)-based studies of cognition and consciousness in DOC, including assessment of basic sensory, perceptual, language, and emotional processing; studies for detection of conscious awareness; paradigms for the establishment of communication in the absence of behaviour; and functional connectivity studies. The advantages and limitations of fMRI and EEG-based measures are examined as research and clinical tools in this population and an explanation offered for the rediscovery of the unique advantages of EEG in the study of DOC.
>
> Major Point: Finds that assessment tools that rely on behavioral output do not tell us anything about the cognitive ability of individuals who cannot speak or move reliably

Ashby, C.E., & Causton-Theoharis, J. (2012), ***"Moving quietly through the door of opportunity": Perspectives of college students who type to communicate,*** **Equity & Excellence in Education, 45:2, 261-282 (paywall access here)**

> Abstract: Colleges and universities across the United States are becoming increasingly diverse. That increased diversity includes students who do not use speech as their primary means of expression. This qualitative study focuses on the experiences and challenges of higher education for individuals with autism who type to communicate using a method known as facilitated communication. This article focuses on the perspectives of these individuals as they make sense of their inclusion in and, at times, exclusion from higher education, particularly their academic and social access. In addition, the findings of this research indicate that while there are structural and classroom supports that are helpful for individuals who type to communicate, their participation and meaningful inclusion is also incumbent on attitudinal factors and how receptive faculty and staff are to the students' method of communication. While there is still much work to be done in the area of higher education for individuals with more complex needs, this study highlights the promise of higher education for this new population of students.

Major Point: Documents perspectives and experiences of college students who type to communicate

Ashby, C. (2011), *Whose "voice" is it anyway? Giving voice and qualitative research involving individuals that type to communicate*, Disability Studies Quarterly, 31:4 (open access here)

Abstract: One of the critical questions facing Disability Studies is how to make central the voices of individuals with disabilities in research? In this paper, I interrogate the idea of "voice" in critical, qualitative research and its application to research involving individuals who do not use speech as their primary mode of expression. How do critical, qualitative research and theories of voice position participants whose means of expression challenge traditional notions of normative participation? I first problematize the premise of giving voice generally and then present four key issues, which include a) the question of competence for individuals who do not use speech, b) hearing silence, c) agency and voice, and d) broadening the conceptualization of voice beyond speech. I conclude with implications for qualitative researchers and others interested in facilitating voice for individuals using alternative forms of expression.

Major Point: Examines the process and importance of conducting qualitative research with individuals who use AAC

Ashby, C. (2010), *The trouble with normal: The struggle for meaningful access for middle school students with developmental disabilities,* Disability & Society, 25:3, 345-358 (paywall access here)

Abstract: This critical, qualitative study considers issues of access to the academic and social experiences of middle school for five students with labels of intellectual disability and autism through a lens of ableism and enforced 'normalcy'. Starting from the position that schools are sites where ableist norms of performance leave many marginalized, this study privileges the perspective of individuals whose inclusion in school is most tenuous. Challenging the notion that mere access to general education classrooms and instruction is enough, this study interrogates questions of efficiency and meaningful engagement within the context of middle school. This paper first illustrates the ways that ableism pervades middle school settings and then outlines a typology of particular ways of being and performing that are privileged and an illusion of normalcy maintained. Finally, this article explores the implications of ableism and enforced normalcy on the engagement and participation of students considered to have developmental disabilities.

Major Point: Explores the ways that speech and other ableist norms of performance are privileged in schools, contributing to the marginalization of those who use AAC

Savarese, D.J. (2010), *Cultural Commentary: Communicate with Me*, Disability Studies Quarterly, 30:1 (open access here)

> Abstract: Last year Dr. Sanjay Gupta of CNN wanted to talk to me so much that he flew me to New York and got me a room at the fanciest hotel in the city, but ironically at my school, most kids choose not to talk to me at all. Why is that?
>
> Major Point: Self-advocate DJ Savarese answers questions about his communication preferences, including recommending that communication partners speak directly to him, disregard certain physical cues, maintain an open mind, and provide choices or wait time

Jorgensen, C.M., McSheehan, M., & Sonnenmeier, R.M. (2009), *Presumed competence reflected in the educational programs of students with IDD before and after the Beyond Access professional development intervention*, Journal of Intellectual & Developmental Disability, 32:4, 248-262 (open access here)

> Abstract: Judgements about students' competence influence the goals of their individualised education programs (IEPs), the location of service delivery, and their placement in general education (GE) as opposed to special education (SE) classes. The purpose of this study was to describe how presumed competence to learn the GE curriculum was reflected in the IEPs of students with intellectual and developmental disabilities (IDD), and in the reported percentage of time that these students spent in GE classes prior to and following the Beyond Access professional development intervention.
>
> Five educational teams of students with IDD participated in a professional development intervention that emphasised students' presumed competence to learn grade-level GE curriculum. Students' pre- and post-intervention IEPs were qualitatively analysed and team member reports of percentage time spent in GE classes were averaged. Five categories of presumed competence were identified. Following intervention, emphasis on learning the GE curriculum, a shift in location of service delivery from outside to within the GE classroom, and increased time spent in GE classes were reported. The Beyond Access intervention shows promise for enhancing views of the competence of students with IDD to learn the GE curriculum and for increasing their inclusion in GE classrooms.
>
> Major Point: Research study examining effectiveness of the Beyond Access professional development intervention, which operationalizes the elements of presumption of competence

Rossetti, Z., Ashby, C., Arndt, K., Chadwick, M., & Kasahara, M. (2008), ***"I like others to not try to fix me": Agency, independence, and autism*****, Intellectual and Developmental Disabilities, 46: 364-375 (paywall access here)**

> Abstract: This article is based on an interpretevist, qualitative research project conducted with individuals labeled with *autism* who type to communicate. Researchers engaged in participant observation and conducted open-ended interviews with 9 participants who were working to develop independent typing skills. Three findings emerged from this research. First, participants shaped a notion of independence that included dependence on various supports. Second, researchers recognized the concept of agency in the interactions between participants and their communication facilitators. Third, participants exercised control of their lives through these expressions of agency.
>
> Major Point: Challenges limited constructions of "independence" and highlights the ways individuals who type to communicate exert agency in their interactions

Biklen, D., & Burke, J. (2006), ***Presuming competence*****, Equity & Excellence in Education, 39:2, 166-175 (open access here)**

> Abstract: At least since the early 1990s, educators in inclusive schooling as well as scholars in Disability Studies have critiqued prevailing notions of intellectual ability and have suggested the importance of interpretive communities for constructing student competence. This work follows in the tradition of education-as-dialogue, which some have argued is a sine qua non for conceptualizing education with individuals who have been traditionally marginalized. The core of this article is a conversation between a university educator and a high school student with autism who types to communicate. Out of this essay, the authors find a series of principles for inclusive schooling, the most central of which is the idea of presuming competence of students.
>
> Major Point: Details the concept of "presuming competence" for individuals with intellectual disability labels, arguing that difficulties with "performance" not be taken as evidence of intellectual ability; includes a dialogue between Biklen and Burke (the authors) that highlight recommendations for inclusive schooling including ideas for physical space, the sensory environment, teacher attitudes and practices, and redefining "normal"

Biklen, D., & Kliewer, C. (2006), ***Constructing competence: Autism, voice and the "disordered" body*****, International Journal of Inclusive Education, 10:2-3, 169-188 (paywall access here)**

> Abstract: Definitions of intelligence have traditionally been rooted in literacy competence. In this article, the authors examine two historical examples where societal prejudices and institutional forces worked to limit and regulate access to literacy. The first example illustrates how racism and denial of competence were so profoundly linked and established in 18th century America that author and poet Phyllis Wheatley was forced to go before a tribunal to demonstrate her faculties. The second example concerns Helen Keller. She too was, on more than one occasion, presumed a fraud and had her literacy interrogated. The authors then identify contemporary instances of societal monitoring of who may be literate, drawing especially on experiences of individuals classified as autistic. Based upon these examples, the authors examine the connection between perceptions of communicative competence and understandings of intelligence and mental retardation.
>
> Major Point: Traces historical roots of dominant understandings of intelligence as connected to literacy competence, noting that restricted access to literacy effectively decided who was "allowed" to be intelligent and who was not, then drawing parallels to contemporary understandings of individuals with autism (particularly those with complex communication needs that manifest in difficulties with verbal speech) as "not intelligent"

Broderick, A.A., & Kasa-Hendrickson, C. (2006), ***"I am thinking that speech is asinine": Narrating complexities and rethinking the notion of "independence" in communication*****, Equity & Excellence in Education, 39: 176-186 (paywall access here)**

> Abstract: This article presents a narrative accounting of a critical interpretivist research study that sought to document the emergence of useful speech in participants who had previously been described as largely nonverbal. The purpose of this piece is to narrate this inquiry process through examination not only of our participants' own accounts of their experiences but also through critical examination of the ways in which we as researchers solicit and respond to those accounts. Our analytic gaze, therefore, focuses on the dialectic process through which we interactively co-construct concepts related to disability in our participants' experiences, alternating between narrating our own experience of this process as researchers and narrating our participants' accounts of their own experiences with this interpretive process. Discussion focuses on critique of the cultural value accorded to the notions of "independence'' and "normalcy,'' and on the participants' demonstration of their own agency in the complex, fluid, and constant process of managing and constructing, in concert with those around them, and often in

the face of significant resistance to the process, their own positive and valued identities as competent communicators.

Major Point: Provides narratives of FC users, including how they negotiate their identities and their use of typing and speech

Broderick, A.A., & Kasa-Hendrickson, C. (2001), ***"Say just one word at first": The emergence of reliable speech in a student labeled with autism*****, The Journal of the Association for People with Severe Handicaps, 26:1, 13-24 (paywall access here)**

Abstract: This article presents a qualitative, interpretivist research study that documents the emergence, in the context of typed expression, of increasingly useful and reliable speech for a young person labeled with autism. The authors construct a descriptive narrative of the process of this young man's emergent speech development and organize the data around four components of this complex, dynamic, and nonlinear process: (a) echolalia or "unreliable" speech, (b) reading out loud, (c) using reliable speech, and (d) integrating speaking and typing. Additionally, the authors identify three categories of supports that this young man and his family experienced and interpreted as being supportive of his emergent speech. These categories include (a) the importance of taking risks, (b) the importance of seeing and hearing words together, and (c) the importance of an inclusive academic education including rich literacy experiences. Throughout, this inductive analysis constructs an understanding of how this young man and his family have experienced and interpreted his emergence as a reliable speaker.

Major Point: Examines evidence of speech before and during typing

Rubin, S., Biklen, D., Kasa-Hendrickson, C., Kluth, P., Cardinal, D.N., & Broderick, A. (2001), ***Independence, participation, and the meaning of intellectual ability*****, Disability and Society, 16: 415-429 (paywall access here)**

Abstract: This article presents a non-speaking person's perspectives on independence and the implications of newfound communication abilities for her participation in the world and upon the meaning of intellectual ability. The person with the communication disability also has autism and, early in her life, was classified by school officials as 'severely retarded'. The narrative focuses especially on the concepts of independence, participation, and intellectual competence or intellectual performance, and their relationship to the concepts of democracy, freedom, and identity, all from a non-essentialist perspective. In addition, the article addresses practical questions about how, from her perspective, the non-speaking person developed the ability to communicate without physical support.

Major Point: Highlights experiences and perspectives of a non-speaking person who learned to type to communicate, including the implications of the shifts in how her competence was regarded over time

Biklen, D., & Duchan, J. (1994), ***"I am intelligent": The social construction of mental retardation*****, Journal of the Association for Persons with Severe Handicaps, 19:3, 173-184 (paywall access here)**

Abstract: Argues that there are two opposing views of mental retardation, normative and competence, and two comparable research approaches in the literature. Mental retardation is viewed as a social construction that accounts for events, behaviors, and phenomena. The experimental and phenomenological approaches to research are contrasted. The controversy about facilitated communication (FC) is seen as a disagreement about objectivist reports of controlled experiments and interpretivist reports of experiences with and systematic observations of FC. Questions about FC are discussed in the context of the competence view of retardation and the experiencing approach to research.

Major Point: Highlights the tensions the FC controversy calls forth about research methodologies; discusses the concept of social construction

VI. General Communication Literature

Wood, R. (2018), ***The wrong kind of noise: understanding and valuing the communication of autistic children in schools*****, Educational Review (open access here)**

Abstract: As a result of the association of autism with speech and language difficulties, autistic school children can be subject to interventions ostensibly intended to remedy these problems. However, my study, based in five mainstream primary schools in England, which incorporated the views and experiences of school staff (n = 36), autistic children (n = 10), their parents (n = 10) and a sample of autistic adults (n = 10), suggests that these inputs do not always provide the children with the help they require. Indeed, notwithstanding some examples of effective assistance, the more evident communication of the autistic children, in its various manifestations, might be ignored and their wishes denied, if deemed not to correspond with the expectations or intentions of the supporting adult. Furthermore, their communication was also found to intersect with the issue of noise in schools, a complex phenomenon which can be an exclusionary factor for autistic children. Indeed, if some forms of noise were tolerated in school, the sounds emanating from autistic children might be disdained, while the communicative value of their silence was not evidently recognised either. Therefore, whether speaking, making noises or remaining silent, autistic children can be deemed to be making the wrong kind of noise. Elucidated via empirical examples from my study, the implications for research and practice are discussed, providing alternative perspectives on how to support the communication of autistic children, leading to greater agency, well-being and educational inclusion on their part.

Major Point: ". . . whether speaking, making noises or remaining silent, autistic children can be deemed to be making the wrong kind of noise."

Cress, C.J., Grabast, J., & Jerke, K.B. (2011), *Contingent interactions between parents and young children with severe expressive communication impairments*, Communication Disorders Quarterly, 34:2, 81-96 (paywall access here)

Abstract: Parents and their children with severe expressive impairments may have limited successful communicative exchanges due to each partner's difficulty in recognizing and responding to communicative behaviors of the other. This study examined the communicative functions and modes of communication that received contingent responses in 20 dyads of parents and young children with severe expressive impairments. Parents responded more often to children's nonvocal behaviors and adult-directed behaviors than vocal behaviors and non-adult-directed behaviors (i.e., child gestures or vocal behaviors that were not conveyed toward the direction of the adult). The children responded more often to parent communication about goal-directed than non-goal-directed tasks. Implications of these results for communication intervention are discussed.

Major Point: "Parents and their children with severe expressive impairments may have limited successful communicative exchanges due to each partner's difficulty in recognizing and responding to communicative behaviors of the other."

Stephens, G.J., Silbert, L.J., & Hasson, U. (2010), *Speaker–listener neural coupling underlies successful communication*, Proceedings of the National Academy of Sciences, 107:32, 14425-14430 (open access here)

Abstract: Verbal communication is a joint activity; however, speech production and comprehension have primarily been analyzed as independent processes within the boundaries of individual brains. Here, we applied fMRI to record brain activity from both speakers and listeners during natural verbal communication. We used the speaker's spatiotemporal brain activity to model listeners' brain activity and found that the speaker's activity is spatially and temporally coupled with the listener's activity. This coupling vanishes when participants fail to communicate. Moreover, though on average the listener's brain activity mirrors the speaker's activity with a delay, we also find areas that exhibit predictive anticipatory responses. We connected the extent of neural coupling to a quantitative measure of story comprehension and find that the greater the anticipatory speaker-listener coupling, the greater the understanding. We argue that the observed alignment of production- and comprehension-based processes serves as a mechanism by which brains convey information.

Major Point: “We used the speaker’s spatiotemporal brain activity to model listeners’ brain activity and found that the speaker’s activity is spatially and temporally coupled with the listener’s activity. This coupling vanishes when participants fail to communicate.”

Cress, C.J., Arens, K.B., & Zajicek, A.K. (2007), *Comparison of engagement patterns of young children with developmental disabilities between structured and free play*, Education and Training in Developmental Disabilities, 42:2, 152-164 (paywall access here)

Abstract: Children with developmental disabilities are slower to develop skills at intentional and symbolic communication than typically developing children, and may rely on atypical patterns of preintentional behaviors to support more complex communication development. The present study compared complex gaze engagement behaviors elicited by 25 preintentional children with developmental disabilities during two interactive contexts: structured object-based play with an examiner and free play with parents that included social play. Children with developmental disabilities demonstrated more onlooking and complex engagement behaviors (i.e., coordinated joint and combined joint), and less unengagement in structured play than in free play. The degree of change in engagement behaviors between play settings was not significantly associated with children’s receptive language, motor, or overall developmental scores. Clinical implications for adapting play and partner behaviors to support more complex engagement behaviors in this population are discussed.

Major Point: This study used guided strategies to help adults elicit child communication behaviors during play. When adults successfully elicited, responded to, and repeatedly encouraged the child’s preintentional communication, the young children with complex communication needs learned to actively engage in their environment. These extended periods of more complex engagement increased the number of opportunities adults had to promote communication development.

Dennis, R. (2002), *Nonverbal narratives: Listening to people with severe intellectual disability*, Research and Practice for Persons with Severe Disabilities, 27:4, 239-249 (paywall access here)

Abstract: This article describes an exploratory study that examined the perspectives of practitioners who spend much of their working day listening to and in some ways "interpreting" for people with severe intellectual disabilities. On the basis of focus group interviews with 23 professional disability-sector workers, including speech therapists, psychologists, and human service workers, the article reports on the importance of a practitioner's values and experience in successful interactions with individuals who rely on self-developed nonsymbolic communication repertoires. The article includes a discussion of the likelihood of including individuals with severe intellectual disabilities in narrative research.

Major Point: Finds personal values strongly influence listening practices; highlights need for practitioners to be aware of environmental, personal, or behavioral factors impacting successful AAC intervention with individuals who are communicating via preintentional and intentional behaviors

Yoder, P., McCathren, R.B., Warren, S.F., & Watson, A. (2001), *Important distinction in measuring maternal responses to communication in prelinguistic children with disabilities*, Communication Disorders Quarterly, 22:3, 135-147 (paywall access here)

Abstract: Two research hypotheses were tested in the research reported here: The first was that non linguistic maternal responses to intentional child communication, but not to preintentional communication, will predict later intentional communication but not later language development. The second hypothesis was that linguistic mapping of intentional communication, but not of preintentional communication, will predict later language development but not later intentional communication. Study participants were 58 children with disabilities or developmental delays and their primary caretakers. Receptive language, prelinguistic communication, and maternal responses were measured at Time 1 (entry into study) and Time 2 (6 months later). Vocabulary level was measured at Time 2. Expressive and receptive language were measured at Time 3 (12 months after entry into study). After controlling for initial measures of child communication or language, number of maternal nonlinguistic responses to intentional communication were positively related to Time 2 rate of intentional communication and to Time 3 expressive and receptive language scores. After controlling for initial child language, number of linguistic mapping responses to intentional communication was positively related to Time 3 expressive and receptive language scores. The results of this study showed no relationship between responsiveness to preintentional communication and later language or communication, thus emphasizing the importance of responding differentially to preintentional and intentional communications.

Major Point: Supports the need to attribute meaning to child communication acts, and provides guidance for focusing the response based on the child's communication intent

McCathren, R.B. (2000), *Teacher implemented prelinguistic communication intervention*, Focus on Autism and Other Developmental Disabilities, 15: 21-29 (paywall access here)

Abstract: The purpose of this case study was to explore the efficacy of a prelinguistic intervention implemented by a classroom teacher in the ongoing daily activities of one special education preschool classroom. The project used a multiple baseline across behavior design for both child and teacher. The participants were a 3-year-old boy with severe communication and cognitive delays and his special education classroom teacher. The teacher implemented a prelinguistic intervention designed to increase the child's frequency and clarity of communication. The strategies used by the teacher were environmental arrangement, following the child's lead, imitation of vocalizations and gestures, modeling of vocalizations and gestures, and prompting for communication. The results indicated that the teacher was able to implement the intervention and showed increases in all the intervention strategies. The child increased his rate of intentional communication, eye contact, vocalizations with consonants, and conventional gestures. Two unanticipated results occurred. First, the child increased his use of symbolic communication, primarily of signs. He also developed symbolic play skills that were not targeted in the intervention. Although the results should be viewed with caution, they warrant further investigation of the use of prelinguistic intervention with young children with communication delays and disorders.

Major Point: Finds that prompting, modeling, and attributing meaning to one 3-year-old boy increased his rate of intentional communication and symbolic play

Yoder, P.J., & Warren, S.F. (1999), *Maternal responsivity mediates the relationship between prelinguistic intentional communication and later language*, Journal of Early Intervention, 22:2, 126-136 (paywall access here)

Abstract: Intentional communication may be related to later language development, in part, because intentional communication is a relatively clear communicative cue, which may elicit language-facilitating maternal responses. As a first step in testing this model, this study was conducted to determine whether the relationship between early intentional communication and later language is in part due to covariation with maternal responsivity. The participants were 58 children with developmental disabilities in the prelinguistic period of development and their mothers. Children's intentional prelinguistic communication, mothers' responses, and children's language were measured at entry into the study, 6 months later, and 12 months later, respectively. The results support the model that the relationship between intentional communication and later language was, in part, due to the covarying relationship with maternal responsivity. Implications for future research are discussed.

Major Point: Finds that maternal responsiveness impacts children's use of intentional prelinguistic communication and is related to later language levels

Yoder, P., & Warren, S.F. (1998), *Maternal responsivity predicts the prelinguistic communication intervention that facilitates generalized intentional communication*, Journal of Speech Language Hearing Research, 41: 1207-1219 (open access here)

Abstract: Family systems theory posits that the relative effectiveness of early interventions will vary depending on various aspects of the family. This study tested whether maternal responsivity would predict the extent to which Prelinguistic Milieu Teaching (PMT) facilitated generalized intentional communication better than a contrast treatment that was conducted in a small group by a responsive adult (i.e., Responsive Small Group, RSG). Fifty-eight children with developmental disabilities in the prelinguistic communication period of development were randomly assigned to one of the two staff-implemented treatment groups. Thirty were assigned to RSG; 28 were assigned to PMT. Mothers were kept naive to the intervention methods, hypotheses, and measures. In families with mothers who responded to a high percentage of the children's communication acts at the pretreatment period, the children in the PMT group used more frequent intentional communication in post-treatment generalization sessions with a trainer and mothers than did children in the RSG group. In the families with mothers who responded to fewer than 39% of their children's communication acts, children in the RSG intervention used more frequent intentional communication in posttreatment generalization sessions with the mothers than did children in the PMT intervention. Other family variables and no child variables that we measured could account for these findings.

Major Point: Finds that attributing meaning to children's communicative attempts helps facilitate positive communication development

Yoder, P.J., Warren, S.F., Kim, K., & Gazdag, G.E. (1994), *Facilitating prelinguistic communication skills in young children with developmental delays II: Systematic replication and extension*, Journal of Speech and Hearing Research, 37: 841-851 (open access here)

Abstract: Four children with mental retardation were studied in the context of a multiple baseline across subjects design. Staff members used a modified version of the milieu teaching method to facilitate intentional requesting. The results replicated the finding that a modified version of milieu teaching was effective in facilitating the use of intentional requesting by children with developmental delays in an intervention context (Warren, Yoder, Gazdag, Kim, & Jones, 1993). This study also extended the Warren et al. (1993) work by (a) documenting that increased intentional requesting generalized to sessions with the children's mothers, (b) demonstrating that mothers who were naive to the purposes of the study were more likely to linguistically map their children's prelinguistic communication after the intervention than before the treatment, and (c) that mothers and teachers who were naive to the purposes of the study linguistically mapped the children's intentional communication more than the children's preintentional communication. We discuss implications of these results for early intervention, the transactional theory of development, and the importance of the distinction between intentional versus preintentional communication.

Major Point: Finds that attributing meaning to children's communicative attempts helps facilitate positive communication development

Warren, S.F., Yoder, P.J., Gazdag, G., Kim, K., & Jones, H. (1993), *Facilitating prelinguistic communication skills in young children with developmental delay*, Journal of Speech and Hearing Research, 36: 83-97 (paywall access here)

Abstract: Very little research has focused on the development and evaluation of intervention strategies designed to facilitate the acquisition of prelinguistic communication skills. We conducted two experiments to determine the effects of a milieu teaching approach on the acquisition and generalization of specific prelinguistic communication skills. In the first experiment, we utilized this intervention approach within a multiple baseline design to teach prelinguistic requesting, commenting, and vocal imitation to a single subject with Down syndrome and language delay. The results indicated that the intervention approach was effective at facilitating the child's use of these skills within the treatment setting. Therefore, in the second experiment we conducted a more comprehensive analysis of this approach with 4 subjects with mental retardation. Three of these subjects were taught to request, and 1 subject was taught both to request and to comment. The effects were experimentally evaluated with multiple baseline across subjects design. The results indicated that the intervention was effective in eliciting the intervention targets within the training setting for all 4 subjects. All 4 subjects showed evidence of generalization across stimulus materials, setting, teachers, and interaction style. There was also evidence of reciprocal effects on how classroom teachers in the generalization setting interacted with the subjects as a result of changes in the child's communication behavior.

Major Point: Finds that attributing meaning to children's communicative attempts helps facilitate positive communication development

VII. Evidence and Research-Related Literature (Generally)

Dindar, K., Lindblom, A., & Kärnä, E. (2017), *The construction of communicative (in)competence in autism: a focus on methodological decisions*, Disability & Society, 32:6, 868-891 (paywall access here)

Abstract: Research on people diagnosed with autism spectrum disorder (henceforth autism) is often based upon biomedical understanding. Such understanding tends to view the characteristics related to autism diagnosis, such as the lack of or atypical use of speech, as a sign of incompetence that can be reduced as an underlying pathology of an individual. However, little research has explicitly investigated how methodological decisions in research might influence the perception of these characteristics. This paper draws on two separate research cases involving minimally verbal children with autism to examine how methodological decisions in research design, data collection, data analysis, and data interpretation influence the construction of communicative (in)competence in these children. The paper encourages researchers to carefully consider and reflect on the methodological decisions they make throughout the research process.

Major Point: Encourages reflection of how researchers' methodological decisions influence how a child with autism is portrayed; exposes gap between deficit perspective and a strengths-based understanding of autism

Bouffard, M., & Reid, G. (2012), *The good, the bad, and the ugly of evidence-based practice*, Adapted Physical Activity Quarterly, 29:1, 1-24 (open access here)

Abstract: The evidence-based practice (EBP) movement has been extremely influential over the last 20 years. Fields like medicine, physiotherapy, occupational therapy, nursing, psychology, and education have adopted the idea that policy makers and practitioners should use interventions that have demonstrated efficiency and effectiveness. This apparently straightforward idea is beginning to affect adapted physical activity; however, researchers and practitioners in our field often appear to be unaware of fundamental questions related to them. The major purpose of this paper is to outline and discuss 10 of these fundamental questions. This analysis leads us to conclude that EBP is a good direction to pursue in adapted physical activity if we develop a type of EBP congruent with the main tenets of our field.

Major Point: Argues that EBP needs to be congruent with the main tenets of the particular field of study.

Green, L.W. (2008), *Making research relevant: If it is an evidence-based practice, where's the practice-based evidence?*, Family Practice, 25:1, 20-24 (open access here)

Abstract: The usual search for explanations and solutions for the research-practice gap tends to analyze ways to communicate evidence-based practice guidelines to practitioners more efficiently and effectively from the end of a scientific pipeline. This examination of the pipeline looks upstream for ways in which the research itself is rendered increasingly irrelevant to the circumstances of practice by the process of vetting the research before it can qualify for inclusion in systematic reviews and the practice guidelines derived from them. It suggests a 'fallacy of the pipeline' implicit in one-way conceptualizations of translation, dissemination and delivery of research to practitioners. Secondly, it identifies a 'fallacy of the empty vessel' implicit in the assumptions underlying common characterizations of the practitioner as a recipient of evidence-based guidelines. Remedies are proposed that put emphasis on participatory approaches and more practice-based production of the research and more attention to external validity in the peer review, funding, publication and systematic reviews of research in producing evidence-based guidelines.

Major Point: Emphasizes "participatory approaches and more practice-based production of the research and more attention to external validity in the peer review, funding, publication and systematic reviews of research in producing evidence-based guidelines"