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All Means All: Implementation of Augmentative and Alternative Communication as a Gateway  
to Achievement

A Dissertation Submitted  
to the Graduate College  
Arkansas Tech University

in partial fulfillment of requirements  
for the degree of

DOCTOR OF EDUCATION

in School Leadership

in the Center for Leadership and Learning  
of the College of Education

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## Abstract

The importance of individuals' ability to communicate cannot be overstated. Educational teams are charged with making educational placement decisions for students, like the ones in this study, with assessment tools that are not normed for nonverbal students with autism. This study focused on identical male twins with autism who are nonverbal and have acquired augmentative communication devices equipped with the Language Acquisition through Motor Planning learning system in order to facilitate their communication and learning. Interviews were conducted with parents, sibling, teacher, principal, and the speech-language pathologist that work directly with the twins daily. The twins received their individual devices in middle school, after failed attempts with other devices. They acquired their devices in order to reduce negative behaviors and improve mood, which impacts their social and academic success. Results from the data, as well as the interviews, indicated the twins demonstrated a reduction in negative behaviors, as well as improved overall mood, which has enabled the twins to participate more with their peers and at family events. The results of this study may be used to assist teams to include other pertinent information when making determinations, including relevant medical records, as well as guidance from family members and teacher-generated data.

*Keywords:* autism, augmentative and alternative communication, least restrictive environment

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## **Chapter 1: Introduction**

### **Background of the Problem**

The demand on students in today's classrooms to demonstrate their expertise not only in terms of academic knowledge, but social and technical competency has never been higher. As schools prepare learners for challenges that have yet to be seen, students with disabilities are often left behind due to societal expectations that students with disabilities are unable to compete at the same level as their typically developing peers (Bueno, 2016; Ochs & Roessler, 2001).

In order for students with disabilities to be college and career ready, educational reform efforts concentrated on aptitudes such as independence, self-advocacy, and interpersonal skills could yield more productive outcomes (Turnbull, Turnbull, Wehmeyer, & Park, 2003). For the two million individuals in the United States diagnosed with autism, particularly the 25% who are nonverbal, the barriers are compounded in part due to the challenges of procuring valid assessment data from students who do not communicate in the typical sense (Drevon, Knight, & Bradley-Johnson, 2017). Atypical administration of standardized assessments yields invalid IQ and achievement results, which subsequently leads to programming and placement decisions that limit students' access to general education settings and interaction with peers. Education delivered in more restrictive settings lends itself to students who are less prepared for college, careers, or social integration into their respective communities (Mercier, 2017).

Autism Spectrum Disorder is a developmental disability defined by diagnostic criteria that include deficits in social communication and social interaction, and the presence of restricted, repetitive patterns of behavior, interests, or activities that can persist throughout life (American Psychiatric Association, 2013). According to the Centers for Disease Control and Prevention (Baio, Wiggins, Christensen, et. al., 2018), one in 59 eight-year-olds in Arkansas was

diagnosed with an Autism Spectrum Disorder. This number has more than doubled since 2010, when one in 150 eight-year-olds were diagnosed. Of these, 42% of children diagnosed were evaluated for developmental concerns by the age of three. Twenty-five percent of individuals with autism were considered nonverbal. Seventy-seven percent of these children had received either a Diagnostic and Statistical Manual - Fifth Edition (2013) diagnosis of autism from a physician or psychologist, or had been determined by an Individualized Education Plan (IEP) team to be eligible for special education services with a primary handicapping condition of autism. The remaining 23% of children identified with an Autism Spectrum Disorder (ASD) had documented symptoms but had not yet been categorized as having an ASD by a physician or other community provider (Baio, et. al., 2018).

Historically, students with an Autism Spectrum Disorder (ASD) were not recognized under the federal protections of laws such as PL 94-142, also known as The Education for All Handicapped Children Act (U.S. Department of Education, n.d.). The law required all schools receiving federal funding to provide for students with disabilities by accommodating their special needs and providing them with a Free and Appropriate Public Education (FAPE) in their least restrictive environment with their general education peers. At that time, autism was not a separate category under which students could receive special education services. This law charged schools with drafting and executing individualized plans that emulated as closely as possible the learning environment for a typical student. It was not until the 1990 Amendments to Public Law 94-142 (formally the Education for All Handicapped Children Act of 1975) were written and were renamed the Individuals with Disabilities Education Act that autism was included as a distinct disability category. As a result, these students were afforded the same

opportunities under the law for a Free Appropriate Public Education (FAPE) as their general education peers.

Autism Spectrum Disorder, as the name suggests, encompasses a range of individuals. On one end, individuals function well in their communities and schools. On the other end, there are individuals who are nonverbal, meaning that they do not possess the skills to communicate their thoughts, needs, and emotions. There are inequities that exist in education for students who are nonverbal. Educators assess nonverbal students with evaluations that are poorly suited to that population. Inappropriate evaluations can result in invalid results, which leads to placement decisions based on inaccurate assessment data (Travers & Ayres, 2015). As a result of the invalid data, students are placed in inappropriately restrictive settings. When students are placed in more restrictive settings, they do not receive the equitable education and social interactions that their typically developing peers experience. Once students who are nonverbal leave school and enter their communities without the tools their peers possess, they are ill equipped to be productive members of society (Kurth, Mastergeorge, & Paschall, 2016).

Administering and scoring an evaluation of a student who is both nonverbal and on the autism spectrum is particularly challenging due to the student's inability to engage with the assessment and communicate responses. There are a myriad of reasons that interfere with valid assessment results, including unfamiliarity with the examiner, involuntary muscle control, and restricted interests commonly associated with autism (Zeliadt, 2017). Autistic symptomology can result in scoring of behaviors rather than the cognitive ability intent of the assessment (Koegel, Koegel, & Smith, 1997; Kuriakose, S., 2012).

The availability of augmentative and alternative communication (AAC) has provided nonverbal students with ASD an avenue to communicate their thoughts. Augmentative and



alternative communication is the use of facial expressions, sign language, gestures, pictures, text messages, or computer-generated outputs that convey thoughts from one person to another (American Speech-Language Association, n.d.).

The growing number of nonverbal students with autism warrants an investigation in order to increase awareness of the disparity between inappropriate assessments and placement decisions that impact students' futures (Kasari, Brady, Lord, & Tager-Flusberg, 2013). Learning more about the relationship between augmentative and alternative communication and nonverbal students with autism could help educators in their future efforts to increase student achievement.

### **Statement of the Problem**

The problem being addressed in this study was that, despite statutory protection that requires students with disabilities to be educated in their least restrictive environment, policymakers, administrators, and educators often rely on outdated practices such as standardized testing of cognitive aptitude as measured by IQ assessments and achievement to place these pupils in more restrictive settings, which is contrary to the intent of the Individuals with Disabilities Education Act (IDEA, 1997). In order for students to maximize their learning potential and generalize social skills across environments, individuals with disabilities must be included in environments with their general education peers (Wright, 2016).

Unfortunately, children who are nonverbal are often placed in more restrictive educational settings due to their lack of communicative ability rather than an absolute need for greater intensity of services. Educators often rely on their experience and professional judgements when making placement decisions for those who have the most significant needs (Kurth, Mastergeorge, & Paschall, 2016). With the increase of school-children with autism and other communication deficits, there is a demand for alternative communication tools that

enhance nonverbal students' abilities to communicate, which requires administrative and legislative support for funding to occur.

The topic of this dissertation concerns the use of augmentative and alternative communication (AAC), particularly the Language Acquisition and Motor Planning system, as a gateway for nonverbal students to participate in lesser restrictive environments, thus raising achievement scores in schools.

### **Purpose of the Study**

The purpose of this case study was to illustrate the degree to which the introduction of an augmentative communication device to identical, nonverbal male twins who have been diagnosed with an ASD facilitated their inclusion in less restrictive educational environments.

### **Definitions of Key Terms**

The terminology associated with special education is necessarily technical and legal. The following terms are defined as used in the current study:

- **Augmentative and alternative communication (AAC):** The American Speech-Language Hearing Association [ASHA] (2013), states that AAC is inclusive of all the ways we share our ideas and feelings other than through oral speech. These methods include gestures, pointing, sign language, pictures, speech generating devices, tablets, or other written modes of communication.
- **Autism Spectrum Disorder:** According to the National Institute of Mental Health, an Autism Spectrum Disorder (ASD) is a developmental disorder that impacts communication and behavior. Though autism can be diagnosed at any age, it is held to be a “developmental disorder” because symptoms generally appear in the first two years of life (NIMH, n.d).

- **Functional communication:** Functional communication includes any behavior involving personalized movements, gestures, verbalizations, signs, pictures, words and augmentative and alternative communication devices that express an individual's needs, wants, feelings, and preferences that others can understand, regardless of context of familiarity to the speaker (ASHA, n.d.).
- **Individualized Education Plan (IEP):** An IEP is an individualized program for children requiring special education services. It contains information regarding the child's current performance, annual goals, special education and related services, accommodations, participation in state and district-wide assessments, needed transition services, measured progress needed to be successful learners, and transfer of rights at the age of majority (Cornell Law School, n.d.).
- **IEP team:** The Individualized Education Plan (IEP) team consists of: the parent(s) of the child; not less than one general education teacher; not less than one special education teacher; a representative of the public agency who is qualified to provide or supervise the instruction provided to the child; an individual who can interpret the instructional implications of evaluation results; other individuals who have pertinent knowledge or expertise in a field relating to the student; and the student with the disability, when appropriate (Center for Parent Information and Resources, n.d.).
- **Non-verbal:** The National Institute on Deafness and Other Communication Disorders [NIDCD] (n.d.) states that individuals who are non-verbal do not possess the ability to use one's voice to communicate with others.

- **Speech-Language Pathologist:** A licensed professional who works to prevent, assess, diagnose, and treat speech, language, social communication, cognitive-communication, and swallowing disorders in children and adults (ASHA, n.d.).

### **Research question**

The research question that was addressed through this study was: How can the use of Augmentative and Alternative Communication (AAC) by students who are both non-verbal and on the autism spectrum provide Individual Education Plan (IEP) teams with information that leads to programming and placement decisions that result in students served in less restrictive environments?

### **Significance of the Study**

The significance of the study was to define how identical, nonverbal male twins interact with their environment through the use of augmentative and alternative communication, which in turn, impacts their achievement in the classroom. The research displayed the progression of events leading to the twins' placement in a restrictive setting due to evaluative procedures not normed for nonverbal students with autism. The study analyzed the obstacles that districts face when placing children with autism who use augmentative and alternative communication in lesser restrictive environments as well as highlight interventions that impact student achievement.

### **Assumptions**

In this case study, it was assumed that the participants answered the questions honestly throughout the interview process. It was also assumed that the anecdotal data provided by the teacher was accurate for the purpose of this study.

### **Limitations**

The limitations of the current study should be considered when interpreting the findings. The primary limitation to the study was the inability to generalize the study across environments and locations. Autism spectrum disorders vary greatly amongst individuals, and interventions that are effective in a particular situation may not prove effective in another.

One threat to internal validity is related to the interview questionnaire. Questions were collected from a previous study and adapted to be relevant to the current study (Kranich, 2018). Bias is another threat to internal validity. Researcher bias should be taken into consideration due to the researchers' knowledge of the participants, and to the fact that her own child, who is nonverbal, uses a similar augmentative communication device.

### **Delimitations**

The focus of this study relies on information regarding students unique by nature. They are male, nonverbal, autistic, identical twins. In order to conduct a study regarding real-time data and complete face-to-face interviews, it was crucial to conduct the research in the area where the twins reside.

The most prevalent threat to the case study was related to the small sample size, which limits the generalizability of the findings. In addition, the twin participants and their family and teacher may not fully represent the collective thoughts and opinions of the whole population of caregivers and educators of nonverbal students with autism.

### **Theoretical Framework**

Due to the constant evolution of service delivery models in special education, two theoretical frameworks emerge as models with the use of AAC in nonverbal students with autism on public schools: the social relational model of disability (Reindal, 2008) and Fullan's Model of Change (1998). The social relational model of disability argues that the emotional and

psychological well-being of a student with a disability plays a large role in the success or failure of an individual in their academic arenas and as future adults. From birth, human beings are incessantly exposed to culturally powerful rules, practices, regulations, and cultural beliefs in order to determine whether they fit the mold of ‘normal’ (Reindal, 2008).

It is the symbiotic relationship of normality and abnormality – and how the terms ebb and flow – that forms the core of the social relational model (Gallagher, Conner, & Ferri, 2014). The model maintains that students with disabilities need to be included as much as possible with general education peers in order to make progress. This social model of disability redefined the scope of disability, not in terms of a medical status of an individual’s impairments, but an artifact of social and political practices, attitudes, and configurations that result in the exclusion and oppression of certain individuals due to their biological features (Burchardt, 2004; Wasserman, 2006; Dalkilic & Vadeboncieur, 2016). In the case of nonverbal individuals with autism, the social context determines whether impairments lead to disablement (Reindal, 2008). The social relational model of disability is appropriate for analyses of education since it considers both biomedical and social roots of disability, while maintaining disability as a form of oppression (Reindal, 2009).

In conjunction with these claims is Fullan’s Model of Change. The first phase, initiation, suggests that students and other stakeholders must embrace access to innovations as well as teacher and central office advocacy in order for students to be successful. Ahtiainen (2017) contends that a “Tri-level Reform” (p.64) of Fullan’s change in ideology requires that schools, districts, and state stakeholders have vertical and horizontal conversations regarding the gap between decision makers and practioners. Until these conversations occur, the change necessary for students with severe disabilities will not occur and it will continue to raise the cost to

taxpayers. In the implementation phase, there is a mandate that includes incentives for teachers such as professional development, resources and classroom assistance from administrators in order to nourish commitment, complete ongoing assessments, and intervene as problems arise (Hopkins, 2003, p.39). Fullan (2010) stated the power of what he called “collective capacity” (p.9). That is, when the group is mobilized with focus and specificity, it can accomplish amazing results (DuFour & Marzano, 2011, p.86). Stage three of Fullan’s model, Institutionalize the Change, requires patience and persistence from the school and its stakeholders (Owston, 2007). At this stage, the school has embraced the new initiative and has incorporated said practices into their daily routines. Miles (1983) maintained that the process is a linear one, which begins with the administrator, whose leadership is the cornerstone to the implementation of the innovation. The three phases evolve over time, and when implemented effectively, can change the school culture to one that benefits the needs of all its students.

### **Summary**

The ability to communicate thoughts, feelings, and ideas is vital to human connection (Hourcade, Pilotte, West & Parette, 2004). Despite Federal regulations in place to support these students, individuals with autism who are nonverbal are particularly vulnerable to disjunction from mainstream society (Hourcade et.al., 2004). Augmentative and Alternative Communication (AAC) is a communication medium by which nonverbal students with autism can not only communicate thoughts and feelings, but participate in activities enjoyed by their peers such as entertainment and gaming (Light & McNaughton, 2012). This study aims to demonstrate the impact AAC has not only on communication in nonverbal, identical male twins with autism, but their ability to make academic gains as well.

## Chapter 2: Literature Review

Accountability is a top priority in schools today. The media have increasingly focused on holding schools accountable for closing the achievement gap between students with disabilities and their general education counterparts since the passage of the No Child Left Behind Act. For policy makers, the challenge of funding for students with disabilities creates great debate. Historically, students with disabilities were not educated with their general education peers (United States Department of Education, 2004). Additionally, decisions regarding curriculum, assessment, and how resulting data were interpreted have lay in the hands of the special education teacher and the student's Individualized Education Plan (IEP) committee (Colman, 2014). This means that there was no consistent way to assess these students in a way that demonstrates what the students actually know versus what they are able to express. With the passage of the Individuals with Disabilities Act (IDEA) in 1990, and subsequent amendments in 1997 and 2004 (Individuals with Disabilities Education Act, 1990/1997), students with disabilities were ensured access to education, which included modifications and accommodations to the curriculum, as well as related services necessary for the student to benefit from special education. On March 22, 2017 the U.S. Supreme Court delivered a unanimous opinion in *Endrew F. v. Douglas County School District* (2017). The Court interpreted the extent of the Free Appropriate Public Education (FAPE) requirements in the Individuals with Disabilities Education Act (IDEA). The Court overturned the Tenth Circuit's decision that Endrew, a child with autism, was entitled to an educational program that was intended to provide "merely more than de minimis" educational benefit. This decision has widespread implications for students with disabilities and district obligations to provide for their specific needs.



The purpose of this literature review is to study the impact assessment data has on the education of students who are nonverbal and have autism. Preconceptions exist in education for students with autism who are nonverbal. This predisposition, though unintentional, carries forward once students leave school and enter their communities without the skills their peers possess in order to be productive members of society. The growing number of nonverbal students with autism in our society warrants an investigation into the manner in which students who have autism and are nonverbal are evaluated. Data obtained from evaluations guides placement and programming decisions made by IEP teams, which directly impacts the environment in which a student with a disability receives special education services. Students in more restrictive settings have fewer opportunities to hone the skills necessary for full integration into the community, as compared to their neurotypical peers who communicate verbally.

### **Methods of Literature Search**

A comprehensive search was conducted using a variety of databases. ProQuest Central, PsycINFO, EBSCO databases and Education Source were searched using a combination of the terms *autism spectrum disorder*, *augmentative communication*, *augmentative and alternative communication*, *nonverbal students with autism*, *Language Acquisition through Motor Planning*, *No Child Left Behind*, *Americans with Disabilities Act*, *Endrew F. decision*, *augmentative and alternative communication with students with autism*, *least restrictive environments*, *Individuals with Disabilities Education Act*, *identical twins with autism*, *computer-assisted communication*, and *computer-assisted instruction*. The search was limited to the years 2003 to 2018. In order to ensure that no relevant articles were excluded, the researcher also conducted a search using the same terms and restricted years using Google Scholar. The reference sections of the articles that met the inclusion criteria were reviewed to ensure that no articles were missed.

Following the initial location of the articles, dissertations, empirical studies, and court decisions, the researcher reviewed the contents to determine eligibility based on criteria for this study. The following criteria were applied: (a) federal law pertaining to nonverbal students with autism, (b) reported empirical data, (c) completed and published in English, (d) inclusion of students with communication difficulties and related behavior challenges, and (e) peer-reviewed. As a result of the search, 62 articles, court cases, and dissertations were found relevant to this literature review.

## **Background**

According to the Centers for Disease Control and Prevention, one out of 68 children are diagnosed with an autism spectrum disorder (ASD) in the United States (Centers for Disease Control and Prevention [CDC], 2016). According to the U.S. Department of Education, students with autism ages three to 21 served under the Individuals with Disabilities Education Act (IDEA) skyrocketed from roughly 94,000 in 2000 to 417,000 in 2011 (Kuo, 2016; United States Department of Education, 2016). Of those, the CDC (2016) estimates that 25% of people with an autism-spectrum disorder (ASD) are nonverbal. There are many plausible explanations for this increase, including enhanced awareness, expansion of diagnostic criteria, improved diagnostic tools and increased reporting. In order to satisfy the requirements of the law while meeting the students' educational needs, administrators are charged with ensuring that services identified in students' Individualized Education Plans (IEPs) are provided, whether or not the district has the requisite funding. These services could include speech, physical, and occupational therapy as well as training for teachers.

According to the American Speech-Language-Hearing Association (ASHA, 1991), services such as speech therapy have improved long-term outcomes for individuals with autism

(Dawson & Osterling, 1997; Harris & Handleman, 2000; Landa & Kalb, 2012). The influx of technology in today's classrooms have allowed augmentative and alternative communication devices (AAC) such as iPads and Chromebooks with speech output software for students with autism to be able to demonstrate proficiency on standardized tests, either on traditional or alternate assessments. Coleman (2014) reported that when the No Child Left Behind (NCLB) and IDEA were interwoven in 2004, special education students were expected to demonstrate proficiency on the identical assessments required of their peers in order for the school to make Adequate Yearly Progress (AYP). The practice of removing students with autism and other disabilities and "placing" them in special education classrooms instead of mainstream classes creates additional disadvantages and widens the achievement gap (Coleman 2004; Larson, 2005).

### **Disabilities as Societal Constructs**

According to the World Health Organization (n.d.), 15% of the world's population (over one billion people) has some type of disability. One's disability affects one's health, learning opportunities, and ultimately reduces one's employment opportunities, which results in higher per capita poverty rates. These issues are not necessarily related to individuals' disabilities, but, instead, are the result of societal barriers placed upon them in their communities (WHO, n.d.). Individuals on the autism spectrum are often subjected to discrimination, humiliation, and human rights violations due to a lack of awareness. Numerous studies in various countries, observed that people commonly perceived individuals with disabilities as high in warmth but low in competence (Cuddy, Fiske, & Glick, 2008; Fiske, Cuddy, Glick, & Xu, 2002; and Tablante & Fiske, 2015). In light of these findings, individuals with disabilities are more likely to be pitied by classmates, colleagues, and community members, which is a disadvantage for people with

disabilities in the classroom, workplace and in the community in general. (Wright & Cunningham, 2017).

Disability is a social construct (Levy, 2000). The way society perceives the term *disability* is tied to one's understanding of the word *ability*. When people use the terms “disabled” or “disability”, it comes with a negative connotation, such as one's inability to live independently due to their physical or mental impairment. Culturally, our perception of living a “full and independent life” means that one attended a public school, has gainful employment, gets married, and has offspring without the use of supports or assistance. Society often perceives people who cannot perform these activities of daily living as less abled. Until our society changes its idea of what it means to be independent or functional, individuals who have challenges will continue to be stigmatized, whether or not the actions are intentional.

### **Individuals with Autism**

Autism is a spectrum disorder characterized by deficits in social communication and social interaction across settings and contexts. The term spectrum denotes that ASDs occur along a continuum with a varied range of symptoms or characteristics that differ in severity, thus accentuating the clinical heterogeneity of the condition (Anderson, 2016). Symptoms are present in the first years of life and cause clinically significant impairments in activities of daily living (American Psychiatric Association [APA], 2013; Ganz, Mason, Goodwyn, Boles, Heath, & Davis, 2014; Lord & Rutter, 2012). Diagnosis occurs when a pediatrician, child neurologist, child psychiatrist, or child psychologist conducts a comprehensive evaluation in order to determine if a child has ASD based on the criteria in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013). In addition, neurologic and genetic testing can be implemented to rule out other disorders and to check for genetic or neurological

problems that can coincide with ASD (CDC, 2016). The root cause of autism continues to be unknown, but experts believe that it is a multifaceted combination of genetic susceptibility and environmental exposures - possibly chemicals or microbes (Norton, 2013). Co-morbidity issues such as constipation, nutrition and sleep problems, attention deficit hyperactivity disorder (ADHD), and other adaptive problems (Bresnahan et. al., 2015; Buie et.al., 2010; Goldman et.al., 2012; Hill et.al., 2014; Holifield et. al, 2018; Ibrahim, Voigt, Katusic, Weaver, & Barbaresi 2009; Sikora, Vora, Coury , & Rosenberg, 2012; Singh & Zimmerman, 2015) make coping with the everyday pressures associated with school more profound.

### **Implications for Students with Autism in the Classroom**

Students with autism are increasingly being educated in the general education classroom with their peers. The Individuals with Disabilities Education Improvement Act of 2004 defined eligibility for services in a public-school setting for students with autism by adding in the component of adversely affecting a child's educational performance (IDEA, 2004).

As a result of the assessment mandates of No Child Left Behind and the expanded accountability of IDEA, the aim of special education has shifted from instructional practices and educational procedures to student outcomes in public schools (Albert, 2015; Witmer & Ferreri, 2014). A significant minority of students with autism, often categorized as 'nonverbal' or 'minimally verbal,' display little or no spoken language. These children are at risk of being labeled 'low-functioning' or 'untestable' via conventional cognitive testing practices (Courchesne, Meilleur, Poulin-Lord, Dawson, & Soulières, 2015). Often, students with autism who have deficits in communication present with behavioral challenges that interfere with learning in the classroom (Boesch, Taber-Doughty, Wendt, & Smalts, 2015; Heath, Ganz, Parker, Burke, & Ninci, 2015; Law, Plunkett, & Stringer, 2012). These behaviors are a method

of communication that require replacement behaviors with substitute methods of communication (Alzrayer, Banda, & Koul, 2014). Without a way to demonstrate understanding of content or to relate this knowledge verbally, nonverbal students with autism are frequently discounted in terms of literacy instruction (Carnahan, Williamson, Hollingshead, & Israel, 2012). Students with autism commonly have atypical sensory responses to stimuli, such as tactile defensiveness and auditory sensitivity (Halloran & Halloran, 2012; Schoen, Miller, Brett-Green, & Nielson, 2009; Tomchek & Dunn, 2007). These atypical responses present additional challenges in the classroom due to the amount of noise, group work, and unstructured routines used in 21<sup>st</sup> century learning environments. Through establishing channels of functional communication and creating social attention, AAC interventions operate as a fitting venue for students to demonstrate appropriate behaviors and express emotions, wants, and needs (Doss & Reichle, 1991; Drager, Light, & McNaughton, 2010).

### **Communication Needs as a Member of Society**

The lack of verbal ability, which compromises participation in basic life events such as speaking (for both understanding and give-and take of conversation), the sharing of common experiences, and expressing wants and needs is a form of isolation that impacts nearly four million Americans (Szilagyi, 2013). Deprived of the ability to produce natural speech, nonverbal individuals are limited in their involvement and inclusion in numerous essential parts of daily life including schooling, family, and events out in the community (Szilagyi, 2013).

For students who lack the ability to communicate verbally, augmentative and alternative communication (AAC) devices can be a viable option for these individuals to express themselves and participate in activities of daily living. A meta-analysis conducted on research concerning low-tech AAC interventions and speech production from 1975 to 2003 revealed a pattern across

study results in marked improvements for students with autism and intellectual disabilities (Miller, Light, & Schlosser, 2006; Potts & Satterfield, 2013). Some of the various forms of AAC devices include speech output devices, iPads, computer applications, and tablets (Bedwani, Bruck, & Costley, 2015). A decrease in negative behavior has been founded as a nontargeted, but a positively collateral outcome, with AAC used as a functional behavior replacement (Iacono, Trembath, & Erickson, 2016; Ganz, Davis, Lund, Goodwyn, & Simpson, 2012). For nonverbal students with an autism spectrum disorder, AAC devices can provide them with the functional communication skills they need to participate spontaneously and independently in a variety of settings (Bedwani et.al, 2015).

### **Communication Issues of Nonverbal Students with Autism Spectrum Disorders**

Many individuals with autism spectrum disorders (ASD's) do not have the ability to construct typical speech to meet their needs (Potts & Satterfield, 2013; Weitz, Dexter, & Moore, 1997). Facility in communication has been established as a predictor for life-long positive outcomes for persons with autism (Lord & Paul, 1997; Potts & Satterfield, 2013). As a result of these and other studies, there is a focus on the goal of assisting children with Autism Spectrum Disorders who are nonverbal to acquire useful communication (Potts & Satterfield, 2013; Department of Health & Human Services, 2004). According to Beukelman & Miranda (2013), there are four elements that are critical when teaching nonverbal individuals with ASD's to communicate effectively using alternative methods to verbal speech: they must be active communicators, they require peers that are experienced communication partners, involved family participation, and educators that can effectively facilitate communication (Chung & Douglas, 2014). This team approach must be applied across settings in order for nonverbal students to be

able to transfer and apply knowledge to unfamiliar locations and with people with whom they do not normally communicate.

The inability to communicate is compounded by the lack of adaptive behavior skills that nonverbal students with autism often experience (Park, Yelland, Taft, & Gray, 2012). The absence of adaptive behavior skills, such as the ability to function independently in one's environment, combined with the inability to communicate, often is displayed in the form of negative behaviors (Park et.al. 2012).

The associated behaviors presented by nonverbal individuals with autism are communication in and of themselves (Beesley, 2016). Repetitive behaviors such as spinning, clapping, and flapping interfere with interactions with others. These behaviors can be learned, yet with the inability to communicate, the issues are compounded and reduce the opportunities to acquire replacement behaviors in a timely manner (Beesley 2016; Yoder & Lieberman, 2010). By allowing behavior such as pointing, screaming, and biting as forms of communication, society is unintentionally stunting psychosocial growth (Bondy & Frost, 2001; Kranich, 2018; Mirenda, 2003; Sigafoos & Mirenda, 2002). Augmentative and Alternative Communication could be used to replace these behaviors with more socially acceptable ones (Kranich, 2018).

### **Augmentative and Alternative Communication**

Augmentative and Alternative Communication (AAC) includes all forms of nonverbal communication including gestures, pointing, and facial expressions that articulate an individual's wants, needs, thoughts, desires, and feelings (Cardon, 2016; American Speech-Language Association, 1991), and is frequently used to support students who display difficulty with communication while encouraging participation in interactive activities in the community (Beukelman & Mirenda, 2013; Chung & Douglas, 2014). AAC denotes a mixed method of



symbols, aids, tactics and techniques manipulated in a way that represents a communicative thought in verbal or written form (Baxter, Enderby, Evans & Judge, 2012; Giangrasso, 2015; Hourecade, Pilotte & West, 2004). AAC is utilized by individuals of all ages and ability levels not only as their primary mode of communication, but as a supplement to other communication modalities (Fields, 2015; Light & McNaughton, 2012; Williams, Krezman, & McNaughton, 2008). For some individuals with an Autism Spectrum Disorder (ASD), augmentative communication serves as both a voice and a modality for written communication through the use of a phone, tablet, or device (Dynavox, 2013; Fields, 2015). A number of AAC interventions focus on growing the number of words used within an AAC system to increase the overall mean length of utterance production (Light, Beukleman, 2003; Wright, 2010). This early word combination phase is crucial for early interactions with others, and it is characterized by the AAC user asking for something, refusal or saying no, and early recognition of items (Gleason, 2016; Wright, 2010). Upon the grasping of these foundational phrases, the AAC user's ability to demonstrate the flexibility of word use, syntax and other grammatical features determines one's linguistic competence, thus launching them towards higher academic achievement.

### **Types of Augmentative and Alternative Communication**

Educational technology has been shown to be an effective vessel for students with autism to communicate their thoughts, feelings, and desires (McMurray, 2016; Neely, Rispoli, Camargo, Davis, & Boles, 2013). Augmentative and Alternative Communication (AAC) is a method that takes the place of verbal communication and fills the void where the user's needs can be met in a socially appropriate manner (McMurray, 2016; Mirenda, 2001) through a variety of AAC delivery systems. There are two forms of AAC used by persons with communication disorders such as autism: aided and unaided (Chiang, H. & Lin, Y, 2008). Aided AAC systems refer to

communication systems with external devices (e.g., communication boards, photographs, line drawings, words, letters, and computer-based technology with voice output). Unaided systems represent communication systems exclusive of any external devices (Chiang & Lin, 2008; Light, Roberts, Demarco, & Greiner, 1998; Mirenda 2003), such as sign language.

The most commonly used AAC approach is the Picture Exchange Communication System [PECS] (Bondy & Frost, 2001; Schreibman & Stahmer, 2013), which guides the users to exchange icons in order to express their thoughts. PECS is an effective way to foster beginning stages of communication and has shown to decrease behaviors associated with autism (Bondy & Frost, 2001; Yoder & Stone, 2006). Systems such as PECS provide the visual support that improves the student's response to speech intervention practices (Cardon, 2016).

High-tech speech generating devices produce synthetic and digitized speech (Singer-MacNair, 2017). They provide the user with a computer generated, multi-layered screen that also provides the user with environmental controls through an infrared control panel (Downey & Hurtig, 2003). AAC devices such as DeltaTalker, Accent 1200, and Gemini allow the user to access the internet as well in order to access content for educational purposes in addition to their communicative components (Downey & Hurtig, 2003).

Recently, the availability of apps for mobile technology devices has increased opportunities for AAC use (Shane, Gosnell, McNaughton, & Sennott, 2011; Singer-MacNair, 2017). Devices such as the iPad, iPhone, and Android phone have made using technology to communicate more socially acceptable (M2 Presswire, 2016). The prospective advantages of these systems over other forms of AAC include portability, competitive affordability, high quality voice output, and ease in programming to meet the individual's communicative requirements (Ganz, 2015; Waddington, van der Meer, Carnett, & Sigafoos, 2017).

## **Language Acquisition and Motor Planning**

Language Acquisition and Motor Planning (LAMP) Words for Life language system is an Augmentative and Alternative Communication (AAC) method intended to provide individuals who are nonverbal or have limited verbal abilities a process by which they can spontaneously and independently convey their thoughts using a speech-generated device (SGD). The primary elements of the LAMP approach consist of: the individual's readiness to learn, engaging the learner through joint engagement, and learning language through a unique and consistent motor plan paired with an auditory signal and a natural consequence (Halloran & Halloran, 2012). Research suggests that Language Acquisition through Motor Planning is indicative of a promising augmentative communication intervention (Bedwani et al, 2013; Halloran, 2013; Pulliam, 2010; and Stuart & Ritthaler, 2008).

## **Teacher Training and Funding**

Current legislation mandates that today's educators employ evidenced-based practices in their daily work (Sansosti, Doolan, Remaklus, Krupko, & Sansosti, 2015, Simpson, 2008, Reichow, Volkmar, & Cicchetti, 2008). In order for students with autism to be successful in the classroom and make progress towards their educational goals, teachers must receive focused professional development in the areas of measurable assessments and differentiated instruction (Kuo, 2016; Nation, Clarke, Wright, & Williams, 2006). Obstacles such as designing, implementing, and planning for instruction, as well as evaluation that integrate new technology frequently occur. Without support of administration, the students' education suffers (Baxter, Enderby, Evans, & Judge, 2012; Fields, 2015).

Instructional technology provides students with 21<sup>st</sup> century learning opportunities (Sundeen, 2013; Jones, Fox, & Levin 2011). Implementation of strategies and technology can be strenuous on a school district. Federal mandates, including No Child Left Behind (NCLB, 2002), have forced districts into choosing between investing in technology and regulatory compliance (Bryant, 2010; Sundeen, 2013). With the passage of Public Law 94-142 in 1975, the basic rights of a free appropriate public education (FAPE), and the provisions of related services are based on a thorough evaluation of the student's needs (Gates, 2014; Huefner, 2005 p.21). Teacher training is not a related service as defined in federal law, hence it cannot be required as part of the student's IEP (Gates, 2014; Sioux Falls School District v. Koupla, 1994). With the implementation of the 2015 federal education law, Every Student Succeeds Act (ESSA), schools are required to disaggregate data in order to ensure all students have the supports they need in order to be successful. These supports include the use of assistive technology for assessments as an appropriate accommodation. The law also stated that one of the primary objectives was to ensure that IEP goals align with postsecondary outcomes or realize competitive integrated employment (National Council on Disability, 2018).

The use of Augmentative and Alternative Communication (AAC) has become an empirically sound method for developing communication for students with disabilities, particularly those with autism (Ganz et.al. 2014; Ganz, Earles-Vollrath, Mason, Rispoli, Heath, & Parker, 2011; Miller, Light, & Schlosser, 2006). Iacono, Trembath, and Erickson (2016) and Smith and Iadarola (2015) stress the significance of early intervention services for students with autism and the impact for future academic success. Teachers can facilitate communication between the student using AAC with their classroom peers by implementing strategies such as wait time for responses, asking open-ended questions, and model pairing (Kent-Walsh &

McNaughton, 2005). These and other strategies have been shown to promote socialization by the AAC user, as well as foster relationships between the device user and their typical peers (King & Fahsl, 2012). The practice of evaluating and assigning technology to students with autism falls on districts where they are only hypothesizing on the effectiveness of the AAC device (Ganz et.al, 2014). This process can be time consuming and expensive, particularly on rural districts with limited budgets (Redding & Walberg, 2012; Sundeen, 2013). Issues including budget cuts and substantial school debt have led districts to implement reduction-in-force and programs in order to keep their doors open due to costs incurred for students with disabilities (Shamlin, 2014). Other states are looking at alternative funding issues such as the “education debit card” (Phillips, 2014) and vouchers due to the inability of districts to provide students with severe disabilities the services they need to be successful.

### **Research question**

The research question addressed through this study was: How can the use of Augmentative and Alternative Communication (AAC) by students who were both non-verbal and on the autism spectrum provide Individual Education Plan (IEP) teams with information that leads to programming and placement decisions that result in students served in lesser restrictive environments?

### **Summary**

Students who are nonverbal present challenges in terms of instructional and financial resources to school districts. The advent of technology, including AAC provides students with a means to communicate and participate with their general education peers. Research suggests when administrators support the use of technology through professional development, students are able to meet their educational goals and make progress toward becoming independent adults.

### Chapter 3: Methodology

#### Background of study

The increasing number of students with disabilities in our public-school classrooms demands a heightened awareness of the effect that educational placement has on academic achievement. Students with communication-related disabilities are particularly susceptible to being in more restrictive environments away from their typically developing peers (Kurth, Mastergeorge, & Paschall, 2016). Those placement decisions for individuals who are nonverbal are often made due to the presumption that these students have low intellectual ability.

Nonverbal students' inability to communicate their thoughts can mislead educators and can cause those students to be denied a Free and Appropriate Public Education (FAPE) in the Least Restrictive Environment (LRE), both of which are guaranteed to students under the federal Individuals with Disabilities Education Act (IDEA) (Carson, 2015). The key term in the phrase "Free and Appropriate Public Education" is *appropriate*, which meant far more than most educators had previously been providing, as seen recently in the *Endrew F. vs. Douglas County School District RE-1* case (Endrew F. v Douglas County School District RE-1, 2017). Prior to *Endrew F.*, the Supreme Court had only argued on FAPE standards once, in *Board of Education of Hendrick Hudson Central School District v. Rowley*, in 1982. In that split decision, the Supreme Court concluded that an Individualized Education Plan was acceptable if it was "reasonably calculated to enable the child to receive educational benefits" (Rowley, 1982, p. 207). Trombly (2017) argues that neither the *Endrew F.* decision, nor a Congressional panel's amicus brief in favor of the plaintiff, address the issue of federal funding for special education, thus exacerbating the problems for schools trying to serve students with the most intensive needs. In the *Endrew F.* decision, the court articulated that districts must design programs to help students to make more than minimum progress. Such a ruling will likely prompt families to

demand, and districts to provide, more costly services than they have previously; yet the districts do not receive the necessary federal resources with which to pay for those services. Schools do not improve student achievement through the academic suppositions and subsequent teachings imposed by our policymakers, but through cooperative commitments by stakeholders in the attainment of additional knowledge and proficiencies (Trombly, 2014). As in *Andrew F.*, numerous families are seeking expensive out-of-district placements due to the lack of supports provided to these students in their home districts. These families are choosing more restrictive environments because what is being provided in the lesser restrictive environment is not meeting their child's needs. If districts want to keep children in their Least Restrictive Environment while doing a better job of providing FAPE, they are going to need to make drastic changes, beginning with using data collection from teachers, speech pathologists, and other professionals when there are not assessment procedures in place that are normed for students who use augmentative and alternative communication in order to express their thoughts and knowledge.

Stephen Hawking, the renowned theoretical physicist, acquired amyotrophic lateral sclerosis (ALS, or Lou Gehrig's disease) at the age of 21. The science community hailed him as a genius. Once the disease affected his communication skills, people continued to recognize him as highly intelligent (Biography.com, 2014). As Christopher Nolan, born quadriplegic and mute, wrote in his memoir, "*What can a crippled, speechless boy do? ... My handicap curtails my collective conscience, obliterates my voice, beckons ridicule of my smile and damns my chances of being accepted as normal*" (Nolan, 1987). Helen Keller, the renowned humanitarian, became extremely ill at seventeen months and lost her hearing and vision. Though many "experts" thought she should be institutionalized, her parents hired Anne Sullivan to work with her. She went on to be the first deaf-blind person to graduate from college (Biography.com, 2014). Had it

not been for her family, her teacher, and Helen's sheer will, her outcome would have been much different, as would the outcomes of others who followed in her footsteps. These and many other individuals have not had the opportunity to demonstrate their abilities due to their lack of communication skills.

The process used to better meet the needs of the growing number of nonverbal students with autism in our society warrants investigation in order that educators may become more informed about how to provide "these students" with genuine opportunities to learn, which will, in turn, increase the prospect of these students becoming successful adults. Investigating the use of AAC devices with nonverbal students with autism could yield valuable information for educators who work with such students. It is conceivable that providing nonverbal students with the opportunity to communicate through these devices could allow them to participate more fully and with greater success in less restrictive – and less costly – environments than the out-of-district settings in which so many of them are placed.

## **Purpose**

Despite the fact that federal law mandates that students with disabilities receive Free Appropriate Public Education in the least restrictive environment, policymakers, administrators, and educators often rely on outdated practices such as standardized testing of intelligence (IQ) and achievement to make eligibility and placement decisions for nonverbal students with autism. As a result, some of these students whose levels of ability are more difficult to ascertain are educated in more restrictive settings than is appropriate – a fact that defies the intent of IDEA (1997). While IDEA has been depicted as an antidiscrimination and civil rights law, special education has not effectively tackled the intricate issues of exclusion and discrimination at both individual and institutional levels (Beratan, 2006; Danforth, 2006; O'Laughlin, 2013). Pending



societal recognition of disabilities as social constructs and not as individual deficits, students in the public schools will maintain their labels and endure the stigmatism as disabled, notably in African American children. African American children with disabilities are disproportionally placed in more restrictive settings than their Euro-American peers (Skiba, Poloni-Staudinger, Gallini, Simmons, & Feggins-Azziz, 2006), which precludes differential access to the general education classroom. (Beratan, 2006; Jordan, 2005; O’Laughlin, 2013; Palley, 2006). Artiles, Harris-Murri, and Rostenburg (2006) contended schools have been essentially preserving these societal biases through their actions and interactions with students receiving special education services (O’Laughlin, 2013). O’Laughlin (2013) and Palley’s (2006) examination of the rights-based perspective of the IDEA established that “laws for people with disabilities must address more than individual rights if these laws are going to be successful in reducing the stigma and improving the status of people with disabilities in society” (p. 234). Vital research has exposed such power relationships, highlighted slanted and false realities, produced opportunities for innovative perspectives, and empowered entities to better position themselves beyond the limitations placed on them by society (Billig, 2008; Creswell, 2007; Crotty, 2003; Glesne, 2011; O’Laughlin, 2013). O’Laughlin (2013) characterizes this phenomenon as the “belief that it is better or superior not to have a disability than to have one and that it is better to do things in the way that nondisabled people do” (Storey, 2007, p. 56).

In order for students to maximize their learning potential and generalize social skills across environments, students with disabilities must be included in environments with their general education peers (Wright, 2016). For students who are nonverbal, this is a daunting task. The term nonverbal is defined as “the sending and receiving of messages in a variety of ways without the use of spoken words” (Bunglowala, 2015). Students with autism who are also

nonverbal resort to behaviors such as biting, scratching, screaming, hitting, and crying in order to attempt communication with those around them. All behavior is communication. Without the use of spoken language, these attempts at communication through negative behaviors often lead to nonverbal students with autism being educated in more restrictive settings away from their peers. The lack of diagnostic tools for students who are nonverbal to demonstrate their knowledge and expression of ideas also leads educators to place students in alternative environments. Educators often rely on their experience and professional judgments (such as conventional testing practices which yield false positive results) when making placement decisions for students who have the most significant needs.

### **Research Question**

The research question that was addressed through this study was: How can the use of Augmentative and Alternative Communication (AAC) by students who are both non-verbal and on the autism spectrum provide Individual Education Plan (IEP) teams with information that leads to programming and placement decisions that result in students served in lesser restrictive environments?

### **Research Design**

Case studies, by design, involve the organization of data by explicit cases for in-depth study and evaluation (Patton, 2015). A case study was appropriate in this study due to the nature of the situation: nonverbal identical male twins with an Autism Spectrum Disorder. The twins were the primary unit of analysis, and the purpose was to gather comprehensive information resulting in a product (case study). The data collected included: interview data, background and anecdotal data, and educational testing results.

Due to the constant evolution of service delivery models in special education, the theoretical framework that emerges as the model in AAC with non-verbal students with autism in

public schools is the social relational model of disability. The social relational model of disability theorizes disability as a type of social subjugation involving the social burden of limitations of activities of daily living on people with impairments and, additionally, the socially created undermining of their psycho-emotional welfare that occurs in multiple settings, such as school and home (Martin, 2013; Smith, 2015). The social relational model of disability relates to special education by definition: students placed in special education are considered unable to perform tasks that are expected for their same aged peers. A qualitative case study approach was employed due to the level of flexibility that is not readily offered by other approaches such as grounded theory or phenomenology (Hyett, Kenny, & Dickson-Swift, 2014). The particular population of this case study – nonverbal twins with an Autism Spectrum Disorder – have been defined by their disability as students who do not possess the intellectual or social ability required to be educated in a general education classroom with their peers. This model is an apposite lens through which to analyze the data in this case study since by design, it promotes the principles used in inclusive communities (Reindal, 2008). The model promotes “people first” language, which includes what an individual can do, as an alternative to identifying individuals as disabled, which focuses on one’s deficits. Through a qualitative research design, this philosophical presumption guided the direction and collection of data, as well as the analysis of data through qualitative methods.

### **Participants**

Participants in this study included a currently practicing special education teacher, a licensed speech pathologist, the male older sibling, and both parents of Jon and Micheal, the identical male twins who are nonverbal and have autism who are at the heart of this study.

**Sample.** Purposeful sampling was used to select the family to participate in this study. The family had received a formal autism diagnosis from a licensed therapist and psychiatrist for

their twins, who receive therapeutic services in and out of school. The focus of this case study was identical male twins from a Northwest Arkansas public school who currently use Augmentative and Alternative Communication devices in their classroom as well as alternate school settings. These students were chosen due to their unique and complex educational and communication needs. The twins are 14-year old eighth graders who received the devices that they currently use the summer before they entered seventh grade. Their older brother is currently a junior in high school. The parents are current educators in the district where the twins are served. The teacher is currently in her second year working on her alternative licensure in special education. Each participant was interviewed separately. The intent was to gain an objective, independent perspective of each teacher, speech-language pathologist, and family member's experiences with autism. Interviews were conducted in person based on the availability of each participant. Their parents, speech pathologist, sibling, and teachers possess unique viewpoints on the lives of these two youngsters whose Autism-associated challenges include behavioral deficits and a lack of communication.

### **Data Collection**

The principal objects of study in this case were two identical twin boys who have been diagnosed with an Autism Spectrum Disorder and are nonverbal. They use augmentative communication devices to communicate. This research study drew on three main research methods: interviews, data collection from teachers, and document analysis of the paperwork used by the school to determine the least restrictive environment and testing accommodations. In order to develop a complete picture for this case study, it was necessary and appropriate to include the parents, older sibling, as well as the teacher of the twins in the study. The parents, speech pathologist, and teachers of these students were invited to participate in the study. Signed

consent forms were obtained from participating parents and teachers, as well as school district administration. Participants were asked to participate as volunteers in the study and will not be compensated for their participation.

### **Reflexivity**

Reflexivity addresses arguably the greatest threat to the accuracy of qualitative research outcomes: the social interaction portion of the interviewer-interviewee relationship (Roller & Lavrakas, 2015). Reflexivity is “experimental, interpersonal, and in-depth in nature” (Patton, 2015, p. 70). The researcher must be aware of one’s bias and record only what was observed directly in the interviews and report data with fidelity. Likewise, the researcher must be candid about her positionality. The researcher for this case study has been teaching special education for the last 17 years in all settings: indirect services, inclusion classes, resource classes, and structured education classes. The researcher has a child with an autism spectrum disorder and a child with cerebral palsy who uses augmentative communication. The case study investigator’s child using the AAC device graduated from a small private college, which gives a perspective unique to this situation. The researcher formerly taught in the schools that the twins attend currently, and has knowledge of the parents, teacher, and speech pathologist through working in the same district.

### **Trustworthiness**

Consistency in overall patterns of data from different sources, and sound explanations for differences in data from various sources, contribute significantly to the general credibility of findings (Patton, 1999). The reliability of the data was maintained through peer review, committee review, as well as data triangulation. Case studies, by design, provide an abundance of conceptual descriptions (Smith, 2018). This researcher had first-hand access to the

participants in order to obtain the needed data. Participants were not only interviewed, but were provided with written questionnaires. Sound relationships were built over the time with the participants through multiple discussions.

### **Data Analysis**

In order to analyze the data, the interviews were recorded and transcribed. Trend data in the form of a LAMP Summary form provided student responses on their respective devices, and information about the number of prompts needed was gathered from the teacher. The aim was to gauge an increase of verbal responses over time which demonstrates an increase in achievement.

### **Instrumentation**

The baseline data that was collected across home and school environments consisted of a LAMP (Language Acquisition through Motor Planning) Summary form and a parent/teacher questionnaire provided by The Center for AAC and Autism. An interview was conducted with the sibling. In order to gauge the boys' growth, data was tallied describing the number of utterances on their devices, the number of adult-assisted prompts, as well as the number of self-bites. This researcher was also an instrument of research, by conducting the interviews and analyzing the transcripts thereof. The social relational model of disability theoretical framework was applied when analyzing the participants' interview transcripts and when considering the overall case.

### **Ethical considerations**

This researcher is uniquely knowledgeable about the population of youngsters who inspired this study. I am the mother of two children: one with an Autism Spectrum Disorder, and one with Cerebral Palsy. My child with Cerebral Palsy is nonverbal and uses an Augmentative and Alternative Communication (AAC) device in order to express herself. I hold a Master's

Degree in Special Education, and I have taught special education for 18 years in the district that the twins who are the focus of this study attend. My positionality both inspired my choice to study this topic and undoubtedly informed my analysis of the data.

With the purpose of ensuring that my findings are trustworthy, I understand the significance of applying empathetic neutrality in this case study. Empathetic neutrality, as described by Patton (2015), is an understanding of an individual's circumstances and perspective without being judgmental. This was achieved through the avoidance of leading questions, providing context, where applicable, for those questions that could be considered difficult, presupposition questions, and illustrative examples.

In order to preserve the integrity of the study, letters of permission for parents, teacher, sibling, speech pathologist, and administrator was dispersed. Care was taken to ensure that the participants fully understood the nature of the study and that their participation was voluntary. Participants had permission to withdraw from the study at any time.

This study was deemed to be one of minimal risk to the participants, as the probability and magnitude of harm or discomfort anticipated in the research was not any greater than any ordinarily encountered in daily life, or during the performance of routine physical or psychological examination or tests.

The superintendent of the district the twins and their brother attend, and in which I, the twins' parents, and their education team are employed gave permission to conduct the research in order to show compliance with protection of human subjects. A statement was made that confidentiality of recovered data was maintained at all times, and identification of participants will not be available during or after the study. The procedures of Arkansas Tech University's

Institutional Review Board (IRB) and the district's were followed, and formal approval was granted by both before the commencement of the study.

### **Summary of chapter**

When Public Law 94-142, the Education for All Handicapped Children Act – the precursor to today's Individuals with Disabilities Education Act – was passed, the intent was for schools to be provided with funding with which to give students with disabilities fair and equal access to a free and appropriate public education. Students in our educational system who are unable to use verbal communication are often placed in restrictive settings based solely on the fact that they are unable to demonstrate their intelligence. The advent of technology has allowed nonverbal individuals, including those with autism and other developmental disabilities, the tools they need in order to express themselves and enjoy activities of daily living.

The present study seeks to determine how the use of augmentative and alternative communication devices might assist in the placement of students who are nonverbal and have Autism Spectrum Disorders in lesser restrictive environments.



## **Chapter 4: Findings**

The purpose of this case study was to illustrate the degree to which the introduction of an augmentative communication device to identical, nonverbal twins with autism helped them respond to others on the devices. The twins' teacher breaks down each task, in this case the use of AAC, into smaller pieces so that learning takes place due to the amount of reinforcement. The focus of the boys' lessons was on expressive and receptive language, and through the process, they were rewarded for appropriate initiations and responses to others. The anecdotal data, along with current data collected for this study, coincides with them entering their new middle school and beginning their new goals and objectives for communication and academics.

### **Setting**

Interview respondents were chosen due to their close, personal understanding, and relationships with the twins. Anecdotal records and historical data were reviewed and used in this study to corroborate information gathered during the interview process, and to provide additional data. Patton (2015) stated the researcher should use interview questions to gain the perspective, depth and detail at "a very personal level" (p. 24). The historical data on the twins was provided by their teacher and speech pathologist with permission from parents. This data included the twins' educational psychological evaluations, their Individualized Education Plans, data regarding behavior, and data responses using their devices. The teacher and speech pathologist interviews were conducted face-to-face at the school the twins' currently attend. The parent and sibling interviews were conducted in the family's home, and the administrator interview was conducted at an off-site setting of his choosing. All interviews consisted of semi-structured, open-ended questions, including an opportunity for participants to have an open dialogue about what they deemed as relevant to the study. All interviews lasted 45 to 70

minutes, and were recorded using a digital recording device, which was then uploaded into a website that transcribed each interview verbatim. The researcher also took hand-written notes throughout each interview to ensure the accuracy of collected data.

## **The Study**

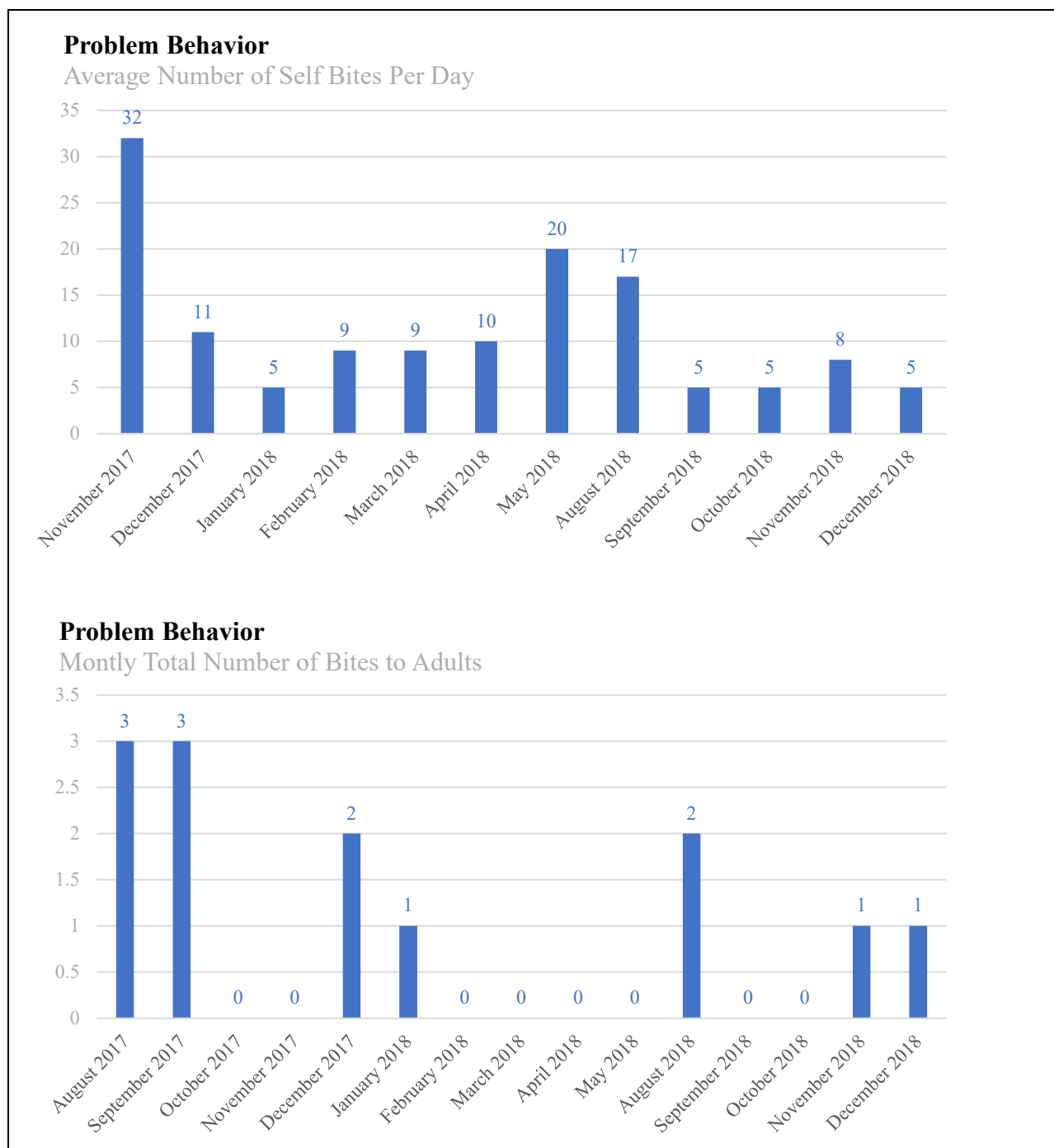
Interview and historical data were analyzed according to how they addressed the research question for this case study: How can the use of Augmentative and Alternative Communication (AAC) by students who are both non-verbal and on the autism spectrum provide Individual Education Plan (IEP) teams with information that leads to programming and placement decisions that result in students served in lesser restrictive environments?

Upon examination of the due process paperwork from the twins' educational records, there was evidence they had received special education services in the self-contained class room from kindergarten to present. The boys had very little interaction with their general education peers, and the positive adult interaction was minimal. The boys required one-on-one assistance at all times, including bus rides to and from school.

In contrast, as the twins' vocabulary and ability to communicate have increased over the past two years, they have been afforded independent time away from their instructional assistants to participate in activities with their general education peers in lesser restrictive environments. They recently attended a field trip where they rode horseback, zip-lined, and ate lunch with their peers. Their peers asked to sit and eat with them at lunch without adults beside them. These and other activities have enabled the boys to experience independence in a way not previously enjoyed by them.

Due to the amount of data on Jon, the anecdotal information, including historical as well as current, was gathered by the teacher. According to requirements set forth in his behavior

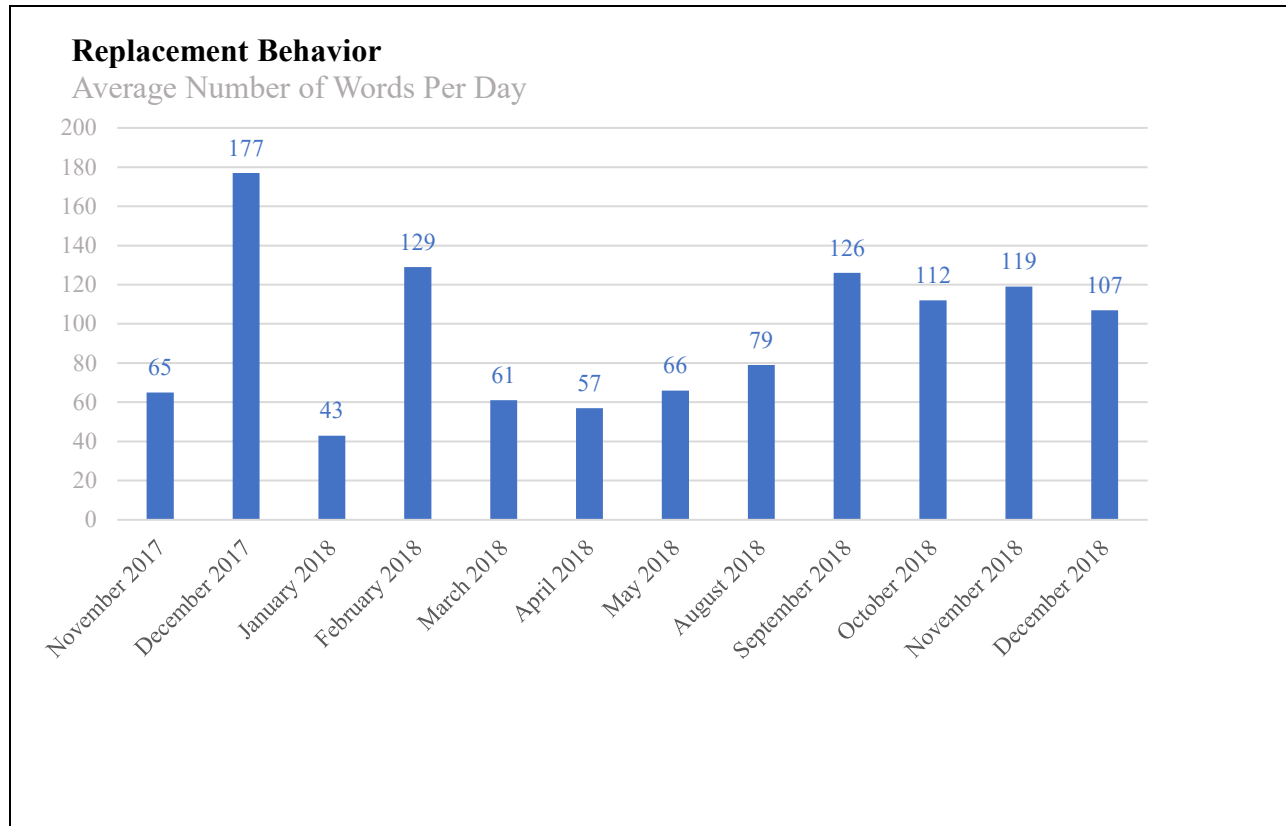
intervention plan, the data was collected in relation to problem behaviors (biting and punching/scratching) and replacement behaviors (words spoken using AAC device). Data was amassed from November 2017 (when the twins received their personal devices) until December 2018. The results for Jon's behavior are shown in Figures 1 and 2.

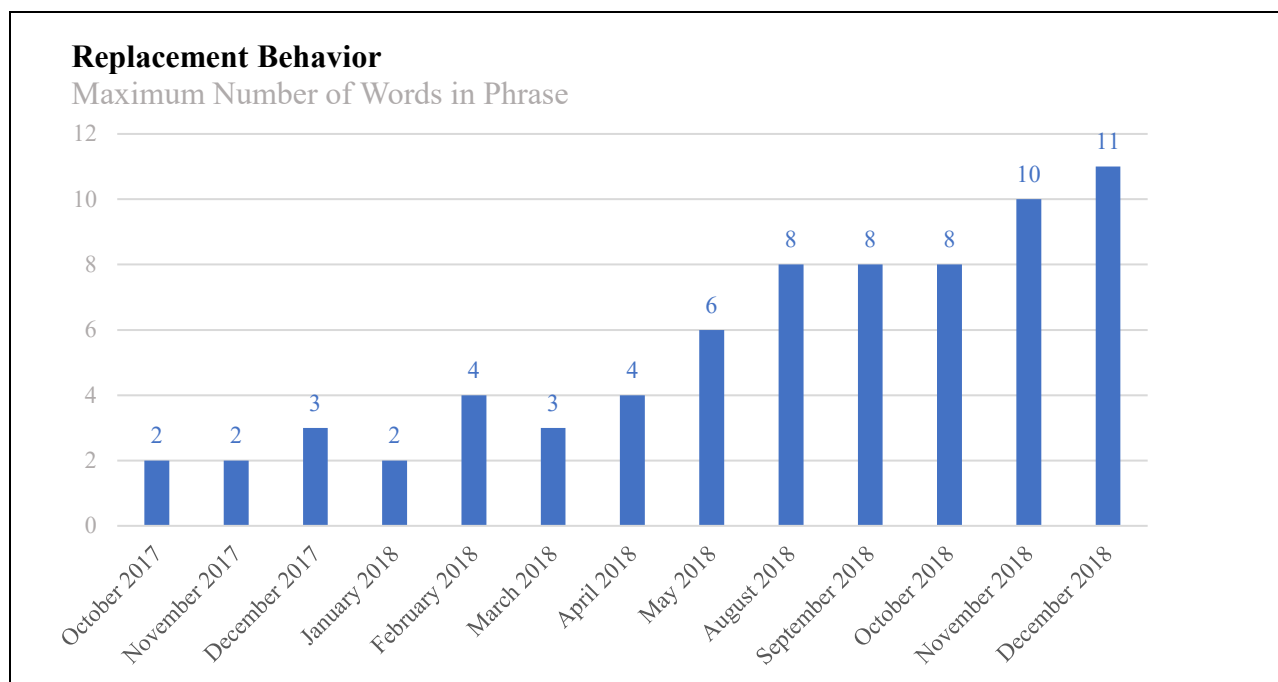


*Figure 1 - Problem Behaviors: Biting*

As figure 1 suggests, the number of problem behaviors peaked at the beginning of the school year, which coincided with the introduction of Jon’s device. The data indicate that when there are significant breaks in instruction (lengthy holidays) and less structure, the behaviors

tended to escalate and increase in number. As noted in Figure 1, the student's bites peaked in the months where there was more than a week of time out of school, such as August and September, and again in December and January. The data also indicated the bites showed a decrease in number when school was consistently in session, and Jon was able to communicate in place of hurting himself and others.





*Figure 2: Replacement Behaviors*

Jon's replacement behavior data shows his mean length of utterance increased as a result of consistent instruction. The data in Figure 2 (average number of words per day) appears to show an indication that lengthy time away from school and inconsistent instruction decreases his ability to communicate his intended message. Figure 2 (maximum number of words in a phrase) demonstrates that Jon's ability to use intended word phrases increased over the course of his middle school years.

Interviews conducted with parents, sibling, teacher, speech-language pathologist, and administrator prompted an investigation of mood data for Micheal. The anecdotal data had been collected by the teacher as a component of his IEP, and continues to be utilized. Data was collected from March 2018 until February 2019 when the twins' IEPs were annually reviewed. As a result of information gathered from Jon, mood data was collected for Micheal in order to determine a pattern of his mood in relation to his AAC use. The results for Micheal's mood data are shown in both Table 1 and Figure 3.

Micheal's behaviors are associated with crying and mood changes. The results from Micheal's mood behavior data indicate that as his brother's behavior escalates, Micheal's mood is altered, thus impacting his academic success. The findings appear to show Micheal's crying episodes decreased over time in relation to Jon's use of AAC and improved behaviors. An interesting note: the twins have little independent interaction with one another until Jon displays negative behaviors which appears to affect Micheal's mood.

## Problem Behavior: Crying

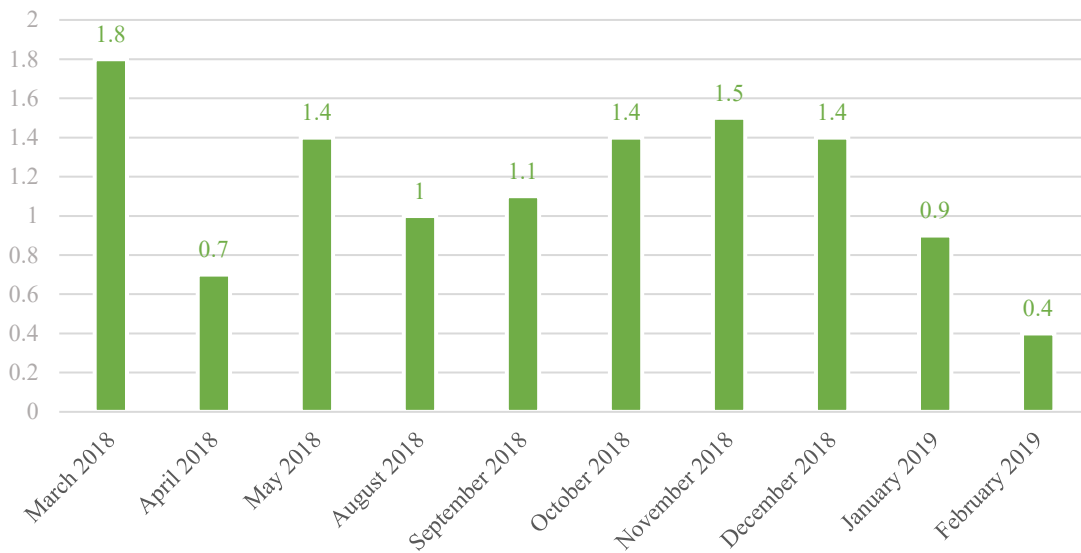
Table 1

*Mood Data for Micheal*

Month	Number of times crving	Number of days	Average/Month
March 2018	22	12	1.8
April 2018	16	23	.7
May 2018	24	17	1.4
August 2018	15	15	1
September 2018	17	15	1.1
October 2018	27	20	1.4
November 2018	25	17	1.5
December 2018	21	15	1.4
January 2019	18	21	.9
Februarv 2019	7	20	.4

## Problem Behavior

Average Number of Times Crying Per Month



*Figure 3: Mood Data*



## Interviews

The semi-structured interview questions, though varied depending on the person, yield results that were consistent across settings. Reoccurring themes, such as empowerment, collaboration, communication, and high expectations were verbalized from all participants, as demonstrated in their responses. The interview questions can be found in Appendix E through H. As noted by Patton (2015), “consistency of finding across types of data increases confidence in the confirmed patterns and themes” (p.660).

**Interview I: Teacher – Ms. Nala.** The first interview was with the twins’ special education teacher. Ms. Nala is characterized as quiet, athletic, and having a dry sense of humor. She has established a rapport with all students, and she is extremely hard working. She goes above and beyond what is expected of her, such as watching the boys on weekends, and she has learned quickly how to navigate the special education realm. She appeared to be a bit uneasy in the first portion of the interview, but promptly became more confident and answered passionately. The teacher and I have previously worked together, which appeared to make her feel more at ease once the interview got underway. She was very methodical with her responses, often pausing before speaking. Ms. Nala is certified in general education ages preschool through fourth grade, and is working on her Master’s degree in special education. She is currently teaching her third year, and she has worked with the twins for the past year and a half.

Ms. Nala was asked to describe her training with the current AAC devices and to describe how comfortable she felt using these devices in the classroom. Ms. Nala expressed that, although she received only three days of training on the AAC devices, she felt most confident when she was learning and teaching the boys during spontaneous conversations. She most enjoyed times when they “argue” with her using their devices, such as telling her “no” when she

asked them to complete a task, because it shows her how far they have come academically and behaviorally. She considers the devices as “empowerment tools” that have allowed them new experiences with their worlds. Ms. Nala shared since the boys have been using their devices, she has seen a drastic change in their self-injurious and aggressive behaviors towards others. They interact more with their peers, and are able to express more than simple wants and needs. The data collection piece was crucial for her day-to-day lessons, and she was excited that they are using longer utterances and generalizing words they have learned into a variety of situations. She felt Jon’s self-bites are a pattern of habit rather than a communication piece. At times she witnesses him bringing his hand to his mouth, pausing, then putting it down, so she speculates it is an automated response that is taking some time to fade. When I asked her about what she wanted the world to know about the boys, she became extremely emotional, teared up, and we stopped recording. When she regained her composure, we began again, and she said, “I would say that the twins are so much more than their test scores, and what their IQ shows... they are funny, playful, smart, and loving.” Ms. Nala shared a story about the boys going to a field trip with their general education peers where “they rode horseback, zip-lined, and ate lunch together with minimal guidance from myself and their aides.” She said that day demonstrated acceptance and additional interactions with their peers, and to her how far they have come. Ms. Nala indicated an excitement for the twins’ future.

**Interview 2: Sibling – Jeffrey.** The twins’ brother, Jeffrey, is a typical junior in high school and plays trombone in the band. He is quite articulate and is involved in the music program at his school. He is of average weight and height for his age, and he is blond like his mother (his twin brothers are dark-haired like their dad). I had only met him once previously, but rapport was easily established through talking about his future plans, and with the interview

setting being in his home. Jeffrey appeared comfortable talking about his siblings, and spoke candidly about his experiences. Jeffrey's demeanor is very relaxed and "laid back."

Jeffrey is the "technology" expert in the house: he often helps his brothers and parents when the twins' devices do not work appropriately, and he assists them with programming words into the devices. Jeffrey was not aware of his brother's being "different" and shared he knew the boys communicated differently once he entered elementary school. He said therapists came to the home when the twins were small, and his siblings "had communication and behavioral challenges that prevented [him] from having a typical sibling relationship." Jeffrey stated he did not have other friends that had siblings with autism, so play dates at Jeffrey's house were minimal due to the noise level of the twins.

When I asked him if life would be different if he had "typically developing siblings," he said, "it would probably be less hectic." He wondered what his interests and influences would be like if they were typical. Jeffrey gave the example of wrestling: "Would I like wrestling if one of my brothers did?" When I asked him about advice he had for other families in similar situations, he paused and then revealed an insight that exemplified his love for his brothers: "Interact with them as much as possible. Treat them like anyone else."

**Interview 3: Parents – Megan and David.** Megan and David have been married for 22 years. They have one other child, a son - Jeffrey, who is two years older than the twins. These parents are very involved with the boys, and advocate for all three. They invited me to their home for their interviews, which gave me insight into what the twins' lives were like when they were not in school. I spoke with them individually in different rooms because they wanted to ensure that their "responses would not be influenced by the other." Both parents were very open about their experiences and were eager to share their perspective regarding their journey.

**David.** David, the dad, has a Bachelor of Music in Education degree. He currently serves as the band director at one of the high schools in the district. He is very outgoing, passionate about his family and work, and has a good sense of humor. He describes his role as the advocate for the boys when situations with agencies becomes challenging, such as defining what least restrictive environment looks like for each twin. David accompanies the boys to medical and dental appointments. He said Megan “takes care of education, such as the devices, and the social-emotional components.” David expressed the splitting of duties works best and they each have an area of expertise within the family.

David discussed the progression of how the boys came to acquire their current devices, and the frustrations the family as a whole have endured while trying to attain the devices that will continue to grow vocabulary-wise as the boys learn more ways to express themselves. The boys began communication as toddlers with sign language, moved to the Picture Exchange Communication System (PECS) in elementary, then shifted to the Proloquo2Go app on a fourth Generation iPhone as well as an iPad in upper elementary and early middle school. Currently, they are using Accent devices with Language Acquisition and Motor Planning (LAMP), which, according to David, has been “transformational in their learning of social and academic tasks.” It is a “tool” that has “unlocked their trapped thoughts, and has given them a way to participate in the community at large.”

As the conversation turned towards Augmentative and Alternative Communication (AAC) and the impact it has on the future for the twins, David shared a story that happened last year, two months after school started and they acquired their devices. Micheal walked to his device and typed in “Go school, love school.” Dad said this was a “turning point” in the evolution of the boys’ communication. This short phrase was the first time either of the boys had

initiated conversation with others that did not involve food or play. It also marked the first time they had ever put words together to express themselves. Since then, the “bar” has been raised, and everyone in their lives expects them to use more phrases and reinforces spontaneous conversations. David felt strongly about having people with “high expectations and a patient personality to be involved when teaching students with autism who are nonverbal.” He stressed his concern about the boys going to another school and having to start again with more students in their classes, but he said he felt like the boys have “learned and continue to learn language” that will help them to be successful. He said that he “felt sorry for the boys” with empathy, in that, “they cannot let other people know what they know.” He paused for a few moments after he shared this comment. It was evident that he cares for them deeply. His biggest advice for educational teams was to have a great deal of communication, data to lead instruction, and “keeping the boys at the front of their minds when making decisions.” David ended the conversation by saying, “one day, be it tomorrow or 10 years from now, that they would be great advocates for kids who are like them.”

**Megan.** Megan, the mom, has a Bachelor of Music in Education degree. She currently serves as an elementary music teacher at one of the schools in the district. She was a more soft spoken than her husband, but she communicated with passion and honesty. Megan stated she “wanted to help other families going through the process,” and was quite forthcoming about their lives with the twins, her older child, and trying to maintain balance in her life. She shared that she is the primary reinforcer for device use, and had led the charge for acquiring the twins’ current devices.

Megan was able to assist me with some background knowledge of relevant medical and educational issues in regards to the twins. The boys were formally diagnosed at age four with

Autism and a Developmental Delay. They received Early Intervention Services and were home-schooled in kindergarten due to their negative behaviors. The boys did not always attend the same school, but are currently in the same classroom with one other student. She shared the reasons why she decided to look into something different for their communication needs were two-fold: first, their phones and iPads were unreliable; and, second, the setup for the apps made it difficult for the boys to learn because the icons changed locations frequently. Currently, the boys are on the Arkansas Medicaid Waiver waiting list in order to receive respite care in the home and to assist with community involvement. The twins have been on the list for 12 years, and Megan is unsure when they will be receiving those services. She expressed her concern about “what will happen to the boys in adulthood if they are unable to communicate with others outside of school and family, or if something happened to her or David.”

Megan spoke candidly about the challenges the boys face as a result of lack of communication, yet she is hopeful they will continue to learn and be able to navigate their environment with assistance. She revealed an insight that most parents will never have to experience: “When the boys are ill, are in pain, or want to express emotions, they are not able to do so, which makes it frustrating and frightening for me and David to assist them in a timely fashion.” She and her husband are constantly playing detective and relying on past behaviors to try and figure out when something is wrong so they can assist. She finds joy in the fact that, when one of the boys was shown a picture of her in the classroom, he said (using his AAC device), “Mom.Blond.Pretty.” To her and his staff, he was showing love for her without using the words I love you, and conveying that he thinks she is pretty. She stated those times make all the difference in the world to her, that the twins are growing in their communication skills, and

that they know so much more than their IQ or standardized tests demonstrate. When ending the interview, mom noted the boys are more than a number, and they have so much love to give.

**Interview 4: SLP – Kasey.** Kasey is the speech-language pathologist that works with the twins at their school. She is tall, and has long blond hair, which the boys find appealing, along with a pouch of treats that she carries. She appears to be very reserved in a large group setting with unfamiliar people, but in an intimate or small group setting she is outgoing and has a humorous disposition. She is quite articulate, and is always assisting others in the school with students she does and does not serve. We conducted the interview in her room at the school after hours, so the room was quiet and favorable for a private conversation. Kasey has worked in adult acute rehabilitation facilities, adult home health, an early intervention cooperative, and public schools since 1992. Though she has had some experience with students with autism who were nonverbal, she has limited experience working with the twins' specific device. She received training on the device, and has a contact at the Prentke-Romich company who manufactured it, along with a representative who is a trainer for the LAMP Words for Life language system for additional assistance as needed.

Kasey shared her experiences of working with the boys, both in the classroom setting where they are learning to use their devices, as well as in the school at-large where they can apply their skills in a broader context. She said the motor-planning aspect of the device has allowed them to pick up vocabulary quicker than in the past, because “the icons never move, so they are more automatic with their use, much like our motor plans when we talk.” Their behaviors (biting, scratching, yelling) have been reduced drastically, and she is noticing they are using words in multiple environments, such as using the word “go” to mean “go swing,” “go

outside,” make the car “go,” and go to the restroom. Kasey noted “this generalization is crucial to their development and future use of the device across settings.”

Kasey discussed the role mood plays in the development of vocabulary acquisition. She hypothesized there may be a connection between mood and hormonal changes that accompany the onset of puberty, and the boys have no way to express how they are feeling (much like their typical peers). The educational team, including Kasey, decided to track Micheal’s moods since he is quite reactive to Jon’s more aggressive tendencies. They found that the more biting, scratching, and screaming Jon displays, the worse mood Micheal demonstrates, particularly through crying. Kasey is working with Micheal to ask to go for a walk, find a favorite spot, or ask for help when he becomes distressed. She is working with Jon on using his device more to express his needs, rather than resorting to negative behaviors. Kasey has changed her approach to therapy as well, since the boys’ AAC use has increased, to include turn-taking and using people’s names instead of generic terms such as teacher. Kasey shared “(Jon) is more purposeful with word choice, whereas his brother is more likely to try and say a word and continues to try until he finds the word he is looking for.” When I asked her to elaborate on that, she added, “(Jon) is more proficient as an AAC user, while (Micheal) is more apraxic, so he needs to hear the word before he can say it himself.” She voiced her anticipation for less restrictive environments as they acquire more communication skills, and would expect that they would be participating with their general education peers more as well. Kasey became extremely emotional when I asked her to tell me what she wanted the world to know about the twins. When she regained her composure, she said, “Each has distinct personalities. When [Micheal] says “mommy, pretty, and love,” I know he misses his mom. “They feel intensely.” The interview concluded with a discussion about the upcoming change in therapists next year. In



this district, speech-language pathologists meet in order to discuss students who are transitioning from building to building in order to make the process a smooth one. Kasey said emotionally, “They are awesome. They are my babies. I don’t know what I’m going to do without them”.

**Interview 5: Principal – Dr. Adkins.** Dr. Adkins is the current principal at a junior high school in the district that serves the twins. He has been an administrator for 15 years: 13 at the middle school level, and two at the junior high level. He is very stoic and professional in his demeanor, and works well with students as well as their families. He has strong ties to his church and community, and has a positive outlook on all aspects of life. He was the twins’ principal the previous two years, and has worked with the teacher, speech-pathologist, and the family as well. I have previously worked for Dr. Adkins, so rapport was easily established and flowed productively. When he entered the room, he was very cordial, and a few minutes was spent catching up on how things were going in our lives and talking about district initiatives.

Dr. Adkins and I spoke on the topic of criteria for placing students with disabilities in more restrictive environments. He stated that the “decisions are based on an individual basis and student need.” Dr. Adkins expressed that even in the most restrictive school settings, students need to be “stretched” with the idea of them moving to a lesser restrictive environment, because “when they graduate from school, there is no such place [i.e., a substantially separate setting] in the real world.” When asked his thoughts on using IQ as a fair determining factor for placement, Dr. Adkins replied, “Not solely, in and of itself...it is a factor. Something that you consider along with multiple other factors.” Expanding on this thought, he added other factors could include “student and family input, teachers who have experience in the area and with the particular student, as well as other assessments.” He went on to say, “the committee should

consider bringing in resources to facilitate learning, try innovative approaches, and reevaluate frequently.”

The conversation led to the topic of working with teams that ultimately make decisions for placing students with disabilities in more or lesser restrictive environments. Dr. Adkins felt that in the case of the twins, he had a level of trust with the parents, and the school’s philosophy on special education “reverberates through the school culture.” Dr. Adkins said students in more restrictive settings “deserve the opportunities afforded to their general education peers.” His biggest take away as an administrator was that the boys had the “opportunity to access communication like they never had before, and changing the setting and/or the teacher would have provided some barriers to their individual and collective growth as young men.”

I questioned Dr. Adkins about what educational teams could do to facilitate more inclusive practices with students who have similar struggles to the twins, and he spoke to the fact that administration “sets the tone for the expectations of all students and staff.” Beyond that, he shared that teachers “need to look for opportunities where students can be more successful academically and socially.” In terms of the impact of working with the twins and their team, Dr. Adkins disclosed this process has “enhanced his understanding of the value of communication and the role it plays in the bigger picture of living an independent life.”

### **Overall Results of the Interviews**

Though there were varied questions for each participant, there were themes that became apparent when transcribing them for analysis. All six participants said the boys showed progress in their ability to communicate. Each participant, in their own words, made the observation the boys were highly intuitive, and their behaviors towards others were based on how the boys

“sensed” people felt towards them. There was also unanimous consensus in the reduction of negative behaviors being displayed as a result of increased communication.

The term “empowerment” came up in the interviews with school personnel in terms of using communication to express desires, wishes, and academic knowledge, whereas the term “inclusion” came up with the family members when talking about the same issues. Three of the four school district employees came to tears when asked about what they saw for the boys in the future, possibly due to the fact they would only serve the twins for the short term. The family expressed some anxiety due to the twins leaving the school, but remained positive when considering the distant future. The education-based participants also felt strongly that IQ and achievement tests should not be the determining factor for determining least restrictive environments and participating with general education peers.

The results of the interviews demonstrated a strong desire for AAC use in the school and home settings. The negative behaviors associated with these particular nonverbal twins with autism have diminished drastically in the last two years, while effective communication has increased astronomically, which in turn has altered the course of their academic careers.

### **Evaluation of the Research Question**

The research question in this evaluation was: How can the use of Augmentative and Alternative Communication (AAC) by students who are both non-verbal and on the autism spectrum provide Individual Education Plan (IEP) teams with information that leads to programming and placement decisions that result in students served in lesser restrictive environments? The researcher inferred through the data that AAC use can supply teams with data that, in conjunction with social histories, IQ tests, and achievement testing, will assist in the development of academic plans for students that can call for their placement in less restrictive

settings. The use of multiple data points or triangulation of data is important when making decisions concerning placement of nonverbal children with autism in less restrictive environments.

## **Summary**

This chapter discussed the results of the study, with the research question being addressed through semi-structured face-to-face interviews and anecdotal records. It was determined through the data that the use of Augmentative and Alternative Communication devices reduced problem behaviors and increased communication between the twins, their educational staff, their parents, and the community at large. The interviews revealed that the twins had attempted other forms of communication, yet their current devices that use Language Acquisition and Motor Planning have facilitated their communication, thus impacting the amount of time they have spent in lesser restrictive environments with their general education peers. It was determined from the interviews that the twins demonstrated social and academic communication that could assist teams in the future with shaping their goals to include more time learning with their neurotypical peers.

## Chapter 5

The purpose of this qualitative case study was to explore the relationship between augmentative communication for two students in Northwest Arkansas – identical twin boys, who have autism spectrum disorder and are nonverbal, and the placement of these learners in lesser restrictive environments in their neighborhood schools with their siblings, cousins, and peers.

The guiding research question for this case study was: How can the use of Augmentative and Alternative Communication (AAC) by students who are both non-verbal and on the autism spectrum provide Individual Education Plan (IEP) teams with information that leads to programming and placement decisions that result in students served in lesser restrictive environments?

### Discussion and Conclusions

This study investigated the question of how an Accent AAC device with the LAMP Words for Life language system use by nonverbal twins with autism leads to programming and placement decisions in the least restrictive environment. Three major findings of this study were noted: (a) reduction of negative behaviors, (b) increased mean length of utterance, and (c) increased positive interactions with both adults and peers.

**Reduction of negative behaviors.** Both twins showed a reduction of negative behaviors over time due to replacement behavior that they had acquired through the use of the AAC device. This finding is congruous with those found in a meta-analysis of low-tech AAC interventions, which had revealed a pattern of marked improvements for students with autism (Miller, Light, & Schlosser, 2006; Potts & Satterfield, 2013). The findings of this study indicate compellingly that the participating students' negative behaviors decreased over time with the use of the AAC devices. This researcher had the opportunity to interact with the boys when they first received

their devices, as well as during the time of the data collection. The difference in the boys in terms of behavior is striking. The first few times I was around them I was definitely intimidated. They were very loud verbally, and often ignored me unless I had a snack or wanted to go outside with them. When I went to their house to interview their brother and parents, they came up to me without hesitation, sat next to me, and I felt completely comfortable. They made cooing noises when I talked to them, and laughed during appropriate times.

**Mean length of utterance.** The second finding from this investigation is that the mean length of utterance increased – and continues to do so – for both twins through the use of AAC. The results of this study indicated through the use of anecdotal and historical data these twins increased the mean length of utterance through the use of AAC. There are a number of AAC interventions focused on growing the number of words used within an AAC system to increase the overall mean length of utterance production (Light, Beukelman, & Reichle, 2003; Wright, 2010). Once grasping these foundational phrases, the AAC user's ability to demonstrate linguistic competence propels the student towards higher academic achievement.

The boys are able to communicate with others who are unfamiliar with them, which is critical for them to be able to interact in daily interactions. I have witnessed them in the grocery store, and they are able to tell parents what they want (in more than one word), and tell others what they like to do using “words” instead of gestures, pointing, or screaming.

**Positive interactions with others.** The final finding was that the twins had more positive interactions with peers and adults, through the introduction and use of the AAC. This finding is in line with that of King and Fahsl (2012), who had found that AAC use had promoted socialization by device users, and fostered relationships between device users and their typical peers (King & Fahsl, 2012).

Since the boys have received their communication devices, students, teachers, and other staff members are experiencing positive interactions with them such as “high fives” in the hall; they go next door with their instructional assistants and teacher to the high school to watch their dad lead the marching band practice, and attend field trips with their general education peers. Every opportunity the boys have to interact with others has led to more inclusion of them with their peers, family, and community.

### **Implications for Education**

The findings from this investigation have implications for practice in two areas: (a) the reduction of negative behaviors in the classroom setting among nonverbal youngsters with autism spectrum disorders, and (b) an increase in the academic achievement of those nonverbal students with autism.

The current reality for districts is that there are federal and state rules and regulations that require specific assessments as part of the evaluation process for students with disabilities. Though these assessments are valuable, they only tell part of the student’s story. The data in this study indicated that the twins were able to improve their academic performance through the use of AAC and data collection of mood. Upon reviewing the data collected in this study, the educational team reflected on their current practices in terms of goals and programming, and as a result, the IEP team changed their programming to reflect more academic rigor and more time with their general education peers in a lesser restrictive environment. When educational teams use data in all its forms (behavior, academic, social), they are more equipped to make programming decisions that will benefit the student as well as build professional learning communities for all students.

**Reduction in negative behaviors.** The participants in this study showed drastic improvement in behavior over a two-year period. By building appropriate channels of functional communication and establishing social attention, AAC systems serve as an appropriate venue for students to demonstrate appropriate behaviors and communicate emotions, wants, and needs (Doss & Reichle, 1991; Drager, Light, & McNaughton, 2010).

**Increase in academic achievement.** The data showed that the marked decrease in negative behaviors prompted a change in focus from behavioral to academic goals on their Individualized Education Plans. The twins' IEPs were revised to reflect target gains in AAC use and communicative intent to meet their objectives in the classroom. Iacomo, Trembath, & Erickson (2016) and Smith & Iadarola (2015) have suggested sufficient evidence exists that early and intensive intervention can amend skill deficits and, thereby, safeguard academic success for children with autism.

### **Suggestions for Future Study**

This study provided two important implications for future research: replication of this study of nonverbal students with autism who use AAC to communicate and the introduction of AAC devices, specifically the LAMP Words for Life language system, at earlier ages than had been the case with the twins who were the focus of this investigation. Though the twins utilized the same AAC “tool”, they benefited differently. Jon was able to reduce his negative behaviors and communicate his feelings appropriately, and Micheal was able to express his emotions in a way that was more easily understood by his teachers, peers, and family. Future studies would be helpful to other practitioners with students who are utilizing the AAC tools employed in this study and are documenting the process. Data could be used to assist both students and educators in



determining the least restrictive environment to meet the needs of nonverbal students with autism through the use of AAC devices.

**Introduction at an earlier age.** Future studies with a focus on the introduction of the AAC device, specifically the Words for Life language system, could be used with students who display similar characteristics to the students in this study at an earlier age. Comparisons of younger children to those who received their devices at a later age to determine if the mean length of utterance is longer and if behavior improves more quickly over time could be studied. It could be determined that more positive peer interaction results when the device is introduced in a youngster's early years.

**Replication of the study.** Studies that undertook similar populations involving nonverbal children with autism would benefit not only these students, but other individuals with disabilities who lack the communication skills necessary for them to demonstrate their abilities. Studies that include children that are early elementary age would be particularly valuable and would be a welcome addition to the literature.

## **Summary**

For too long, people who cannot communicate have been misunderstood. When people are unable to communicate in ways that listeners can understand, listeners make assumptions that those individuals are less capable. Educators regularly make placement decisions based on inappropriate measures, and are oftentimes not equipped with the tools they need to make these decisions. The researcher was compelled to study how communication aids can alter the course of a student's (in this case, twins') life. The study has empowered the participants to share their love for these children, and to describe how AAC has given them insights into the boys' worlds. The powerful "tool" of augmentative and alternative communication (AAC) provided a pair of

young men a “voice” that has not only improved their interactions with others, but shown the community around them that they have a lot to contribute and share. Though they boys received their devices later in their school careers, their story continues to inspire others, including this researcher.

## References

- Ahtiainen, R. (2017). *Shades of change in Fullan's and Hargreaves's models; Theoretical change perspectives regarding Finnish special education reform* (Doctoral dissertation). University of Helsinki. Helsinki, Finland.
- Albert, S. M. (2015). *Program evaluation of students with autism in one school system in North Carolina*. Retrieved from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1699340634?accountid=8364>
- Alzrayer, N., Banda, D., & Koul, R. (2014). Use of iPad/iPods with individuals with autism and other developmental disabilities: A meta-analysis of communication interventions. *Review Journal of Autism and Developmental Disorders*, 1(3), 179-191. doi:10.1007/s40489-014-0018-5
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Association. Retrieved from: <https://www.psychiatry.org/patients-families/Autism/what-is-autism-spectrum-disorder>
- American Speech-Language Association (n.d). Augmentative and alternative communication: Introduction to AAC. Retrieved from <https://www.asha.org/njc/aac/>
- American Speech-Language Association (1991). *Report: Augmentative and alternative communication*, American Speech-Language Hearing Association, 33 (Suppl.5), 9-12. Retrieved from: <http://www.sfusdspe.org>
- Americans with Disabilities Act of 1990, Pub. L. No. 101-336, 104 Stat. 328 (1990)

- Anderson, K. M. (2016). *Parents' understanding of sensory processing in their child with autism spectrum disorder* (Doctoral dissertation). Retrieved from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1809108610?accountid=8364>
- Autism Treatment Center of America (2018). *The Son-Rise Program*. Retrieved from <https://www.autismtreatmentcenter.org/>
- Baxter, S. Enderby, P., Evans, P., & Judge, S. (2012). Barriers and facilitators to the use of high technology augmentative and alternative communication devices: A systematic review and qualitative synthesis. *International Journal of Language & Communication Disorders*, 47(2), 115-129. doi: 10.1111/j.1460-6984.2011.00090.x
- Bedwani, M., Winchester, E., Simmons, T., Robertson, J., & Costly, D. (2013, February). Evaluation of the Language Acquisition and Motor Planning (LAMP) program with children with autism spectrum disorders (ASD). *Aspect Research Insights*, 6, 1-4. Retrieved from: <https://www.Autismspectrum.org.au/sites/default/files/PDFuploads/Research%20Insights%20Iss%206-LR.pdf>
- Beukelman, D., & Mirenda, P. (2013). *Augmentative and alternative communication: Supporting children and adults with complex communication needs* (4th ed.). Glenview, IL: Brookes Publishing Co., Inc.
- Billig, M. (2008). Nominalizing and de-nominalizing: A reply. *Discourse & Society*, 19(6), 829-841. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/1413296531/fulltextPDF/7753B52A94444701PQ/13?accountid=8364>

Biography.com Editors (2014). Stephen Hawking Biography. Retrieved from

<https://www.biography.com/scientist/stephen-hawking>

Biography.com Editors (2014). Helen Keller Biography. Retrieved from

<https://www.biography.com/activist/helen-keller>

Boesch, M., Taber-Doughty, T., Wendt, O., & Smalts, S. (2015). Using a behavioral approach to decrease self-injurious behavior in an adolescent with severe autism: A data-based case

study. *Education & Treatment of Children*, 38(3), 305. Retrieved

from <https://libcatalog.atu.edu:2409/docview/1735394297>

Bondy, A., & Frost, L. (2001). The picture exchange communication system. *Behavior Modification*, 25, 725–744. Retrieved from

<https://libcatalog.atu.edu:2409/central/docview/2030542028/1CBC06A355DC4EA7PQ/2?accountid=8364>

Bresnahan M, Hornig M, Schultz, A, et. al. (2015). Association of maternal report of infant and toddler gastrointestinal symptoms with autism: Evidence from a prospective birth

cohort. *JAMA Psychiatry*, 72(5), 466–474. Retrieved from

<https://libcatalog.atu.edu:2217/10.1001/jamapsychiatry.2014.3034>

Bryant, J. (2010). Dismantling rural stereotypes. *Educational Leadership*, 68(3), 54-58

Bueno, S. A. (2016). *The role of relationships with institutional agents in the academic trajectory of first-generation college students with disabilities: A grounded theory study.*

Retrieved

from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1790806863?accountid=8364>

- Buie T., Campbell, D., Fuchs, G., Furuta, G., Levy, J., Vandewater, J., Whitaker, A., Atkins, D., Bauman, M., Beaudet, E., Edward, G. Gershon, M., Hyman, S. Jirapinyo, P. Jyonouchi, H., Kooros, K., Kushak, R., Levitt, P., Ley, S., Lewis, J., Murray, K., Natowicz, M., Sabra, A., Wershil, B., Weston, S., Zeltzer, L., & Winter, H. (2010). Evaluation, diagnosis, and treatment of gastrointestinal disorders in individuals with ASDs: A consensus report. *Pediatrics*, 125(Suppl1), S1-S18. Retrieved from <https://libcatalog.atu.edu:2217/10.1542/peds.2009-1878C>
- Bunglowala, A & Bunglowala, A. (2015). Nonverbal communication: An integral part of teaching learning process. *International Journal of Research in Advent Technology Special Issue 1st International Conference on Advent Trends in Engineering. Science and Technology 8 Maret "ICATEST 2015"*, p.371-375. Retrieved from <http://www.ijrat.org/downloads/icatest2015/ICATEST-2015128.pdf>
- Burchardt, T. (2004). Capabilities and disability: The capabilities framework and the social model of disability. *Disability and Society*, 19, 735-51
- Cardon, T. (Ed.). (2016). *Technology and the treatment of children with autism spectrum disorder*. Switzerland: Springer International Publishing
- Carnahan, C. R., Williamson, P. S., Hollingshead, A., & Israel, M. (2012). Using technology to support balanced literacy for students with significant disabilities. *Teaching Exceptional Children*, 45(1), 20-29. doi:10.1177/004005991204500104
- Centers for Disease Control and Prevention. (2016). *Community report on autism*. Retrieved from <http://www.cdc.gov/autism>

- Chiang, H., & Lin, Y. (2008). Expressive communication of children with autism. *Journal of Autism and Developmental Disorders*, 38(3), 538-45. doi:  
<http://libcatalog.atu.edu:2097/10.1007/s10803-007-0423-z>
- Chung, Y., & Douglas, K. (2014, September/October). Communicative competence inventory for students who use augmentative and alternative communication [Article]. *Teaching Exceptional Children*, 47(1), 56. Retrieved from:  
<http://journals.sagepub.com/toc/tcxa/47/1>
- Coleman, F. (2014). Bridging the gap between policy and practice: Using negotiated rulemaking to build consensus on assessments in special education. *The American University Journal of Gender, Social Policy & the Law*, 22(3), 693-720. Retrieved from  
<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1567683677?accountid=8364>
- Courchesne, V., Meilleur, A., Poulin-Lord, M., 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. <http://doi.org/10.1186/s13229-015-0006-3>
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage. Retrieved from  
<https://libcatalog.atu.edu:2409/central/docview/1413296531/fulltextPDF/7753B52A94444701PQ/13?accountid=8364>
- Crotty, M. (2003). *The foundations of social research: Meaning and perspective in the research process*. Thousand Oaks, CA: Sage. Retrieved from  
<https://libcatalog.atu.edu:2409/central/docview/1413296531/fulltextPDF/7753B52A94444701PQ/13?accountid=8364>

- Cuddy, A., Fiske, S. & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS Map. *Advances in Experimental Social Psychology*, 40, 61–149. Retrieved from <https://www.hbs.edu/faculty/Pages/item.aspx?num=34511>
- Dalkilic, M. & Vadeboncoeur, J. (2016). Re-framing inclusive education through the capability approach: An elaboration of the model of relational inclusion. *Global Education Review*, 3(3), 122-137. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1114861.pdf>
- Department of Health & Human Services (2004). *Report to Congress on Autism Activities Under the Children's Health Act of 2000*. Retrieved from <https://iacc.hhs.gov/publications/report-to-congress/2004/>
- Doss, S. & Reichle, J. (1991). *Replacing excessive behavior with an initial communicative repertoire*. Baltimore, MD. Paul H. Brookes. Retrieved from [https://www.researchgate.net/publication/51523624\\_Effects\\_of\\_AAC\\_interventions\\_on\\_communication\\_and\\_language\\_for\\_young\\_children\\_with\\_complex\\_communication\\_needs](https://www.researchgate.net/publication/51523624_Effects_of_AAC_interventions_on_communication_and_language_for_young_children_with_complex_communication_needs)
- Downey, D., & Hurtig, R., (2003). Augmentative and alternative communication. *Pediatric Annals*, 32(7), 466-74. Retrieved from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/217554493?accountid=8364>
- Drager, K., Light, J., & McNaughton, D. (2010). Effects of AAC interventions on communication and language for young children with complex communication needs. *Journal of Pediatric Rehabilitation Medicine*, 3(4), 303-10. Retrieved from



[https://www.researchgate.net/publication/51523624\\_Effects\\_of\\_AAC\\_interventions\\_on\\_communication\\_and\\_language\\_for\\_young\\_children\\_with\\_complex\\_communication\\_needs](https://www.researchgate.net/publication/51523624_Effects_of_AAC_interventions_on_communication_and_language_for_young_children_with_complex_communication_needs)

Drevon, D., Knight, R., & Bradley-Johnson, S. (2017). Nonverbal and language-reduced measures of cognitive ability: A review and evaluation. *Contemporary School Psychology, 21*(3), 255-266. doi:<http://libcatalog.atu.edu:2097/10.1007/s40688-016-0114-x>

DuFour, R. & Marzano, R. (2011). *Leaders of learning: How district, school and classroom leaders improve student achievement*. Bloomington, IN: Solution Tree Press.

Erdem, R. (2017). Students with special educational needs and assistive technologies: A literature review. *TOJET: The Turkish Online Journal of Educational Technology, 16*(1), 128-146. Retrieved from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1889347686?accountid=8364>

ESSA (2015). Every Student Succeeds Act of 2015, Pub. L. No. 114-95 § 114 Stat. 1177 (2015-2016). Retrieved from [https://ncd.gov/sites/default/files/NCD\\_ESSA-SWD\\_Accessible.pdf](https://ncd.gov/sites/default/files/NCD_ESSA-SWD_Accessible.pdf)

Fields, A. (2015). *Examining Barriers with Implementing Augmentative and Alternative Communication in a Midwest School* (Doctoral dissertation). Walden University, Minneapolis, MN

Fiske, S., Cuddy, A., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology, 82*(6), 878-

902. Retrieved from  
[https://cos.gatech.edu/facultyres/Diversity\\_Studies/Fiske\\_StereotypeContent.pdf](https://cos.gatech.edu/facultyres/Diversity_Studies/Fiske_StereotypeContent.pdf)
- Fullan, M. (1998). *The meaning of educational change: A quarter of a century of learning: International handbook of educational change*. Dordrecht, Netherlands: Springer.
- Fullan, M. (2011). *The moral imperative realized*. Thousand Oaks, CA: Corwin Press
- Gallagher, J., Conner, D., & Ferri, B. (2014). Beyond the far too incessant schism: Special education and the social model of disability. *International Journal of Inclusive Education*. 18(11), p. 1120-1142. Retrieved from  
[https://www.researchgate.net/publication/265606292\\_Beyond\\_the\\_far\\_too\\_incessant\\_schism\\_Special\\_education\\_and\\_the\\_social\\_model\\_of\\_disability](https://www.researchgate.net/publication/265606292_Beyond_the_far_too_incessant_schism_Special_education_and_the_social_model_of_disability).
- Ganz, J., (2015) AAC interventions for individuals with autism spectrum disorders: State of the science and future research directions. *Augmentative and Alternative Communication*, 31, 203-214. doi:10.3109/07434618.2015.1047532.
- Ganz, J., Mason, R., Goodwyn, F., Boles, M., Heath, A., & Davis, J. (2014). Interaction of participant characteristics and type of AAC with individuals with ASD: A meta-analysis. *American Journal on Intellectual and Developmental Disabilities*, 119(6), 516-535. doi:10.1352/1944-7558-119.6.516
- Ganz, J., Davis, J., Lund, E., Goodwyn, F., & Simpson, R. (2012). Meta-analysis of PECS with individuals with ASD: Investigation of targeted versus non-targeted outcomes, participant characteristics, and implementation phase. *Research of Developmental Disabilities*. 33(2):406–418. Retrieved from  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5036660/#b28-ndt-12-2349>

- Ganz, J., Earles-Vollrath, T., Mason, R., Rispoli, M., Heath, A., & Parker, R. (2011). An aggregate study of single-case research involving aided AAC: Participant characteristics of individuals with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 5, 1500–1509. <http://dx.doi.org/10.1016/j.rasd.2011.02.011>
- Gates, J. (2014). *A legislative and judicial analysis of individualized education program related services*. (Doctoral dissertation). Kent State University. Kent, OH. Retrieved from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1649167757?accountid=8364>
- Giangrasso, D. (2015). Exploring social development in a child with autism who uses the language acquisition through motor planning treatment approach. *Education and human development* (master's thesis). The College at Brockport, NY
- Glesne, C. (2011). *Becoming qualitative researchers: An introduction*. Boston, MA: Pearson. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/1413296531/fulltextPDF/7753B52A94444701PQ/13?accountid=8364>
- Gleason, J. (2016). *The Development of Language: Third Edition* (pp. 1-38). New York, New York: Macmillan Publishing Company. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/577096877/8891177EBEC741C1PQ/13?accountid=8364>
- Goldman, S., Richdale, A., Clemons, T., & Malow, B. (2012). Parental sleep concerns in autism spectrum disorders: Variations from childhood to adolescence. *Journal of Autism and Developmental Disorders*, 42, 531-538. Retrieved from <https://libcatalog.atu.edu:2217/10.1007/s10803-011-1270-5>

Halloran, J., & Halloran, C. (2012). *LAMP: Language Acquisition through Motor Planning*.

Wooster, OH: The Centre for AAC and Autism.

Halloran, J. (2013). *Research Insights into LAMP (Language Acquisition through Motor Planning) Institute Designed for Educating All Students Institute*. Symposium conducted at the Educating All Students Conference, St. Simon's Island, GA.

Heath, A., Ganz, J., Parker, R., Burke, M., & Ninci, J. (2015). A meta-analytic review of functional communication training across mode of communication, age, and disability. *Review Journal of Autism and Developmental Disorders*, 2(2), 155-166.  
doi:10.1007/s40489-014-0044-3

Hill A., Zuckerman K., Hagen A., Kriz D., Duvall S., Van Santen J., Nigg J., Fair D, Fombonne E, (2014). Aggressive behavior problems in children with autism spectrum disorders: Prevalence and correlates in a large clinical sample. *Research in Autism Spectrum Disorders*. 8, 1121-1133. Retrieved from  
<https://libcatalog.atu.edu:2217/10.1016/j.rasd.2014.05.006>

Hourcade, J., Tami, E., West, E., & Parette, P. (2004). A history of augmentative and alternative communication for individuals with severe and profound disabilities. *Focus on Autism and Other Developmental Disabilities*, 19(4), 235-244. Retrieved from  
<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/205002457?accountid=8364>

Hopkins, D. (2003). *School improvement for real*. New York, NY: RoutledgeFalmer

Huefner, D. (2005) *Getting comfortable with special education law: A framework for working with children with disabilities*. (2<sup>nd</sup>) Norwood, MA: Christopher-Gordon Publishers, Inc.

- Hyett, N., Kenny, A., & Dickson-Swift, V. (2014). Methodology or method? A critical review of qualitative case study reports. *International Journal of Qualitative Studies on Health and Well-Being*, (9). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4014658/citedby/>
- 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). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5036660/#b28-ndt-12-2349>. doi:10.2147/NDT.S95967
- Ibrahim, S., Voigt, R., Katusic, S., Weaver, A., & Barbaresi, W. (2009). Incidence of gastrointestinal symptoms in children with autism: A population-based study. *Pediatrics*. 124, 680-686. Retrieved from <https://libcatalog.atu.edu:2217/10.1542/peds.2008-2933>
- Individuals with Disabilities Education Improvement Act, art. 34 C.F.R. § 300.7(c)(1) § (2004)
- Jeanne, V., Holifield, C., Neumeyer, A., Perrin, J., Powers, E., Van, L., & Kuhlthau, K. (2018). Expanding the capacity of primary care to treat co-morbidities in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 1-9. doi: <http://libcatalog.atu.edu:2097/10.1007/s10803-018-3630-x>
- Kasari, C., Brady, N., Lord, C., & Tager-Flusberg, H. (2013). Assessing the minimally verbal school-aged child with autism spectrum disorder. *Autism research: Official journal of the International Society for Autism Research*, 6(6), 479-93.
- Kent-Walsh, J., & McNaughton, D. (2005). Communication partner instruction in AAC: Present practices and future directions. *Augmentative and Alternative Communication*, 21(3),

195-204. Retrieved from

<https://libcatalog.atu.edu:2409/central/docview/1039297698/B5B6B8033FFC453APQ/3?accountid=8364>

King, A., & Fahsl, A. (2012). Supporting social competence in children who use augmentative and alternative communication. *Teaching Exceptional Children*, 45(1), 42-49. Retrieved from

<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1039297698?accountid=8364>

Kranich, E. R. (2018). *Parents' perspective on their child's use of voice output communication aids: Challenges, benefits and missing pieces (master's thesis)*. California State University, Long Beach, Ca. Retrieved from

<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/2030542028?accountid=8364>

Kuo, N. (2016). Informing instruction of students with autism in public school settings. *Journal of Educational Issues*. 2(2), 1-45.

Kuriakose, S. (2012). *Standardized cognitive assessments in children with autism* (Doctoral dissertation). University of California, Santa Barbara, Ca. Retrieved from

<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1238204471?accountid=8364>

Kurth, J., Mastergeorge, A., & Paschall, K. (2016). Economic and demographic factors impacting placement of students with autism. *Education and Training in Autism and Developmental Disabilities*, 51(1), 3-12. Retrieved from

<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1764709833?accountid=8364>

Larson, N. (2005). The time has come, the walrus said, to speak to many things. *Learning Disability Quarterly*. 28(4), 247-248. Retrieved from:  
<http://journals.sagepub.com/doi/pdf/10.2307/4126963>

Lauderdale-Littin, S., Howell, E., & Blacher, J. (2013). Educational placement for children with autism spectrum disorders in public and non-public school settings: The impact of social skills and behavior problems. *Education and Training in Autism and Developmental Disabilities*, 48(4), 469-478. Retrieved from  
<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1503664856?accountid=8364>

Law, J., Plunkett, C. C., & Stringer, H. (2012). Communication interventions and their impact on behaviour in the young child: A systematic review. *Child Language Teaching and Therapy*, 28(1), 7-23. doi:10.1177/0265659011414214

Light, J., Beukelman, D., & Reichle, J., (2003). *Communicative competence for individuals who use AAC: From research to effective practice*. Baltimore: Paul H. Brookes Publishing.  
Retrieved from <https://libcatalog.atu.edu:2409/central/docview/577096877/8891177EBEC741C1PQ/13?accountid=8364>

Light, J., & McNaughton, D. (2012) The Changing face of augmentative and alternative communication: Past, present, and future challenges. *Augmentative and Alternative Communication*, 28(4), 197-204. doi: [10.3109/07434618.2012.737024](https://doi.org/10.3109/07434618.2012.737024)

- Light, J., Roberts, B., Dimarco, R., & Greiner, N. (1998). Augmentative and alternative communication to support receptive and expressive communication for people with autism. *Journal of Communication Disorders*, 31, 153–180. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/205286321/8C4E6713E372488APQ/1?accountid=8364>
- Lord, C., & Paul, R. (1997). Language and communication in autism. In D.J. Cohen & F.R. Volkmar (Eds.), *Handbook of autism and pervasive development disorders*, 2<sup>nd</sup> edition. New York, NY: John Wiley
- Lord, C., & Rutter, M. (2012). Autism Diagnostic and Observation Schedule. In *Autism Diagnostic Observation Schedule* (2nd). Torrance, CA: WPS
- M2 Presswire (2016). Global speech generating devices market forecast to 2022 - key players are dynavox, jabbla bvba & words+ inc. (2016, Jul 13). *M2 Presswire* Retrieved from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1803522867?accountid=8364>
- McMurray, K. (2016). *A comparison of two types of augmentative and alternative communication systems (iPad and PECS) for children with autism spectrum disorder: The benefits of integrating assistive technology into the ASD classroom* (Order No. 10110115). Available from ProQuest Central. (1796924407). Retrieved from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1796924407?accountid=8364>
- Mercier, K. (2017). Students with intellectual disabilities accessing postsecondary education settings: Promoting education equity: Seeing students for their ability first and supporting their development as contributing members into a diverse society. Retrieved



from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1887227085?accountid=8364>

Miles, M. (1983). Unraveling the mystery of institutionalization. *Educational Leadership*, 41(3), 14–19. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/1789291729/F11A1A16EA1D470APQ/7?accountid=8364>

Millar, D., Light, J., & Schlosser, R. (2006). The impact of augmentative and alternative communication intervention on the speech production of individuals with developmental disabilities: A research review. *Journal of Speech, Language, and Hearing Research*, 49, 248–264. [http://dx.doi.org/10.1044/1092-4388\(2006/021\)](http://dx.doi.org/10.1044/1092-4388(2006/021))

Mirenda, P. (2001). Autism, augmentative communication, and assistive technology: What do we really know? *Focus on Autism and Other Developmental Disabilities*, 16(3), 141–151. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/1796924407/8CF CDC9E5444434APQ/9?accountid=8364>

Mirenda, P. (2003). Toward functional augmentative and alternative communication for students with autism: Manual signs, graphic symbols, and voice output communication aids. *Language Speech and Hearing Services in Schools*, 34, 203–216. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/2030542028/1CBC06A355DC4EA7PQ/2?accountid=8364>

Mirenda, P. (2003). Toward a functional augmentative and alternative communication for students with autism: Manual signs, graphic symbols, and voice output communication aids. *Language, Speech, and Hearing Services in Schools*, 34, 203–216. Retrieved from

<https://libcatalog.atu.edu:2409/central/docview/205286321/8C4E6713E372488APQ/1?accountid=8364>

Nation, K., Clarke, P., Wright, B., & Williams, C (2006). Patterns of reading ability in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 36(7), 911-919. Retrieved from <http://dx.doi.org/10.1007/s10803-006-0130-1>

National Council on Disability (2018). IDEA series: Every student succeeds act and students with disabilities. Retrieved from [https://ncd.gov/sites/default/files/NCD\\_ESSA-SWD\\_Accessible.pdf](https://ncd.gov/sites/default/files/NCD_ESSA-SWD_Accessible.pdf)

Neely, L., Rispoli, M., Camargo, S., Davis, H., & Boles, M. (2013). The effect of instructional use of an iPad on challenging behavior and academic engagement for two students with autism. *Research in Autism Spectrum Disorders*, 7(4), 509- 516.

No Child Left Behind (NCLB) Act of 2001. Pub.L.No. 107-110, § 115, Stat. 1425 (2002).

Norton, A. (2013, 08). New clues to causes of autism found. *U.S. News & World Report*, 1.

Retrieved from

<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1437346862?accountid=8364>

O'Laughlin, L. C. (2013). *The least restrictive environment clause of the individuals with disabilities education act and institutional ableism: A critical discourse analysis* (Order No. 3565194). Available from ProQuest Central. (1413296531). Retrieved from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1413296531?accountid=8364>

Ochs, L., & Roessler, R. (2001). Students with disabilities: How ready are they for the 21st century? *Rehabilitation Counseling Bulletin*, 44(3), 170. Retrieved from

<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/213915009?accountid=8364>

- Owston, R. (2007). Contextual factors that sustain innovative pedagogical practice using technology: An international study. *Journal of Educational Change*, 8(1), 61-77. doi: <http://libcatalog.atu.edu:2097/10.1007/s10833-006-9006-6>
- Park, C., Yelland, G., Taffe, J., & Gray, K. (2012). Brief report: The relationship between language skills, adaptive behavior, and emotional and behavior problems in pre-schoolers with autism. *Journal of Autism and Developmental Disorders*, 42(12), 2761-6. doi: <http://libcatalog.atu.edu:2097/10.1007/s10803-012-1534-8>
- Patton, M. (1999). Enhancing the quality and credibility of qualitative analysis. *Health Services Research*. 34(5). 1189-1208 Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1089059/>
- Patton, M. (2015). *Qualitative research and evaluation methods* (4<sup>th</sup> ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Phillips, E. (2014). U.S. news: Schooling on a “debit card”: Arizona program for special-needs students grows; Accountability issue persists. April 17 (A3). *Wall Street Journal, Eastern Edition*. New York, NY. Dow Jones & Co.
- Potts, M., Satterfield, B. (2013). *Studies in AAC and autism: The impact of LAMP as a therapy intervention*. IDEAS Georgia Conference, St. Simon’s Island, GA
- Pulliam, M. H. (2010). *The initial and renewed impact of an AAC device, using the LAMP approach, on an individual with autism spectrum disorder* (Master’s thesis). Retrieved from <https://search.proquest.com/docview/818749513>

- Redding, S., & Walberg, H. (2012). *Promoting learning in rural schools*. Lincoln, IL. Center on Innovation and Improvement. Retrieved from:  
[http://www.centerii.org/survey/downloads/promoting\\_learning\\_in\\_rural\\_schools.pdf](http://www.centerii.org/survey/downloads/promoting_learning_in_rural_schools.pdf)
- Reichow, B., Volkmar, F., & Cicchetti, D. (2008). Development of the evaluative methods for evaluating and determining evidence-based practices in autism. *Journal of Autism and Developmental Disorders*, 38, 1311–1319
- Reindal, S. (2008). A social relational model of disability: A theoretical framework for special needs education? *European Journal of Special Needs Education*, 23(2), 135-146.  
doi:10.1080/08856250801947812
- Reindal, S. (2009). Disability, capability, and special education: Towards a capability-based theory. *European Journal of Special Needs Education*, 24, 155-168. Retrieved from  
<https://files.eric.ed.gov/fulltext/EJ1114861.pdf>
- Roller, M., & Lavrakas, P. (2015). *Applied qualitative research design: A total quality framework approach*. New York, NY: The Guilford Press. Retrieved from  
<https://researchdesignreview.com/2012/11/14/interviewer-bias-reflexivity-in-qualitative-research/>
- Sansosti, F., Doolan, M., Remaklus, B., Krupko, A., & Sansosti, J. (2015). Computer-assisted interventions for students with autism spectrum disorders within school-based contexts: A quantitative meta-analysis of single-subject research. *Review Journal of Autism and Developmental Disorders*, 2(2), 128-140. doi:10.1007/s40489-014-0042-5
- Schoen, S, Miller, L, Brett-Green, B, & Nielsen, D. (2009). Physiological and behavioral differences in sensory processing: A comparison of children with autism spectrum

- disorder and sensory modulation disorder. *Frontiers in Integrative Neuroscience*. 3, 1-11.  
Retrieved from: <https://www.frontiersin.org/articles/10.3389/neuro.07.029.2009/full>
- Schreibman, L. & Stahmer (2013). A randomized trial comparison of the effects of verbal and pictorial naturalistic communication strategies on spoken language for young children with autism. *J Autism Dev Disord* (2014) 44: 1244. <https://doi.org/10.1007/s10803-013-1972-y>. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4005390/>
- Shamlin, Willford III (2014). Back-to-school bootcamp for students with disabilities. *Philadelphia Tribune*. 13, (45)3A. Retrieved from: <https://libcatalog.atu.edu:443/login?url=https://search.proquest.com/docview/1610981770?accountid=8364>
- Shane, H., Gosnell, J., McNaughton, D., & Sennott, S. (2011). Mobil devices and communication apps. Current trends and future directions. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/1972061354/10A6E225EE944CDEPQ/1?accountid=8364>
- Sigafoos, J., & Mirenda, P. (2002). Strengthening communicative behaviors for gaining access to desired items and activities. In J. Reichle, D. Beukelman, & J. Light (Eds.), *Exemplary practices for beginning communicators* (pp. 123– 156). Baltimore, MD: Brookes.  
Retrieved from <https://libcatalog.atu.edu:2409/central/docview/2030542028/1CBC06A355DC4EA7PQ/2?accountid=8364>
- Sikori, D., Vora, P., Coury, D., & Rosenberg, D. (2012). Attention-deficit/hyperactivity disorder symptoms, adaptive functioning, and quality of life in children with autism spectrum

- disorder. *Pediatrics*. 130(Suppl S), 91-97. Retrieved from  
<https://libcatalog.atu.edu:2217/10.1542/peds.2012-0900G>
- Singer-MacNair, K. (2017). *Challenges to augmentative and alternative communication interventions with autism spectrum disorder students* (Order No. 10639718). Available from ProQuest Central. (1972061354). Retrieved from  
<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1972061354?accountid=8364>
- Singh, K., & Zimmerman, A. (2015). Sleep in autism spectrum disorder and attention deficit hyperactivity disorder. *Seminars in Pediatric Neurology*. 22(2), 113-125. Retrieved from  
<https://libcatalog.atu.edu:2217/10.1016/j.spen.2015.03.006>
- Sioux Falls School District v. Koupal (December 21, 1994). Retrieved from:  
<http://law.justia.com/cases/south-dakota/supreme-court/1994/18670-1.html>
- Skiba, R., Poloni-Staudinger, L., Gallini, S., Simmons, A., & Feggins-Azziz, R. (2006). Disparate access: The disproportionality of African American students with disabilities across educational environments. *Exceptional Children*, 72(4), 411-424. Retrieved from  
<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/201222299?accountid=8364>
- Smith, P. (2018). Collecting sufficient evidence when conducting a case study. *The Qualitative Report*, 23(5), 1043-1048. Retrieved from  
<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/2049976577?accountid=8364>
- Smith, T. & Iadarola S. (2015). Evidence base update for autism spectrum disorder. *Journal of Clinical and Child Adolescent Psychology*. 44(6):897–922. Retrieved from  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5036660/#b28-ndt-12-2349>

- Stuart, S., & Ritthaler, C. (2008). Case studies of intermediate steps/between AAC evaluations and implementation [Entire issue]. *Perspectives on Augmentative and Alternative Communication*, 17. Retrieved from: <https://www.aacandautism.com/lamp/research>
- Sundeen, T. H., & Sundeen, D. M. (2013). Instructional technology for rural schools: Access and acquisition. *Rural Special Education Quarterly*, 32(2), 8-14. Retrieved from <https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1941338705?accountid=8364>
- Tablante, C. & Fiske, S. (2015). Teaching social class. *Teaching of Psychology* 42(2). 184-190. Retrieved from: [https://www.researchgate.net/publication/276398752\\_Teaching\\_Social\\_Class](https://www.researchgate.net/publication/276398752_Teaching_Social_Class). DOI: 10.1177/0098628315573148
- Tomchek, T. & Dunn, W. (2007). Sensory processing in children with and without autism: A comparative study using the short sensory profile. *American Journal of Occupational Therapy*, 61, 191-200. Retrieved from: [https://www.researchgate.net/publication/6391395\\_Sensory\\_Processing\\_in\\_Children\\_With\\_and\\_Without\\_Autism\\_A\\_Comparative\\_Study\\_Using\\_the\\_Short\\_Sensory\\_Profile](https://www.researchgate.net/publication/6391395_Sensory_Processing_in_Children_With_and_Without_Autism_A_Comparative_Study_Using_the_Short_Sensory_Profile)
- Travers, J. & Ayres, K. (2015). A critique of presuming competence of learners with autism and other developmental disabilities. *Education and Training in Autism and Developmental Disabilities*, 50(4), 371–387
- Trombly, C. (2014). Schools and complexity. *Complexity*, 11(2), 40-58. Retrieved from <https://journals.library.ualberta.ca/complexity/index.php/complexity/article/view/19017/16160>

- Trombly, C. (2017). *Unfulfilled Promises, Unfunded Mandates, An Unsustainable Situation: Federal Special Education Funding in Light of Endrew F.* Paper submitted (7/2017) for consideration for the AERA 2018 Annual Conference
- Turnbull, H., Turnbull, A. Wehmeyer, M., & Park, J. (2003). A quality of life framework for special education outcomes. *Remedial and Special Education, 24*(2), 67. doi: <http://libcatalog.atu.edu:2097/10.1177/07419325030240020201>
- Waddington, H., van der. Meer., Carnett, A., & Sigafoos, J. (2017). Teaching a child with ASD to approach communication partners and use a speech-generating device across settings: Clinic, school, and home. *Canadian Journal of School Psychology, 32*(3-4), 228-243. doi: <http://libcatalog.atu.edu:2097/10.1177/0829573516682812>
- U.S. Department of Education, National Center for Education Statistics (2016). *Digest of education statistics*, 2012. NCES 2014-015. Retrieved from: <https://nces.gov/fastafsts/display.asp?id=64>
- U.S. Department of Education (2004). *Laws and Guidance: Thirty Years of Progress in Educating Children with Disabilities Through IDEA*. Retrieved from: <https://www2.ed.gov/policy/speced/leg/idea/history30.html>
- Wasserman, D. (2006). Disability, capability, and thresholds for distributive justice. In A. Kaufman (Eds.), *Capabilities equality: Basic issues and problems* (pp. 214-234). London: Routledge. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1114861.pdf>
- Weitz, C., Dexter, M., & Moore, J. (1997). AAC and children with developmental disabilities. In S. Glennen & D. DeCoste (Eds.), *Handbook of augmentative and alternative communication* (395-431). San Diego, CA: Singular



- Witmer, S. E., & Ferreri, S. J. (2014). Alignment of instruction, expectations, and accountability testing for students with autism spectrum disorder. *Focus on Autism & Other Developmental Disabilities*, 29(3), 131–144. Retrieved from 10.1177/1088357614522294
- Wright, S. (2010). *Improving the social communication competence of augmentative and alternative communication users*. ProQuest Dissertations Publishing. 3408057. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/577096877/8891177EBEC741C1PQ/13?accountid=8364>
- Yoder, P., & Lieberman, R. (2010). Brief Report: Randomized test of the efficacy of picture exchange communication system and highly generalized picture exchanges in children with ASD. *Journal of Autism and Developmental Disorders*, 40, 629-632. <http://dx.doi.org/10.1007/s10803-009-0897-y>. Retrieved from <https://libcatalog.atu.edu:2409/central/docview/1791396107/612099E9F2644D2PQ/2?accountid=8364>
- Zeliadt, N. (2018). IQ tests are biased against people with autism. *The Atlantic* (December 31). Retrieved from [https://www.theatlantic.com/health/archive/2018/12/why-many-people-autism-have-low-iq-scores/578974/?utm\\_source=twitter&utm\\_term=2018-12-31T12%3A40%3A10&utm\\_campaign=the-atlantic&utm\\_content=edit-promo&utm\\_medium=social&fbclid=IwAR1w8iVFntUjRnr3E60VWCDsKKug7jdjFLCTosmt3USEkDgN8qcAD7vA64w](https://www.theatlantic.com/health/archive/2018/12/why-many-people-autism-have-low-iq-scores/578974/?utm_source=twitter&utm_term=2018-12-31T12%3A40%3A10&utm_campaign=the-atlantic&utm_content=edit-promo&utm_medium=social&fbclid=IwAR1w8iVFntUjRnr3E60VWCDsKKug7jdjFLCTosmt3USEkDgN8qcAD7vA64w)
- Yoder P, Stone W. A randomized comparison of the effect of two prelinguistic communication intervention on the acquisition of spoken communication in preschoolers with

ASD. *Journal of Speech, Language, and Hearing Research*. 2006a; 49:698–711.

Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4005390/>

## Appendix A

### Parent Questionnaire

1. Please describe your children's current level of communication.

Nonverbal

Almost never verbal

Somewhat verbal

Mostly verbal

2. Augmentative and alternative communication (AAC) means using some form of communication that is designed to either add to or replace a more typical means of communication, usually speech. Do you currently use some form of AAC with your children?

Yes \_\_\_\_\_

If yes, what brand and software?

3. Do your children use other forms of communication? If so, check all that apply.

Manual signs

☐ Facial expressions

☐ Gestures

☐ Pantomime

☐ Drawings

☐ Picture cards

☐ Picture Exchange

Communication

System (PECS)

☐ Choice Board

☐ Visual Schedules

☐ Social Stories

☐ Speech-generating device

☐ Apps of Apple iPad TM

☐ Apps on Apple iPhone TM

☐ Apps on Google Android TM

Other: \_\_\_\_\_

4. Using the scale below, how often do you use each of the checked AAC options?

Almost never

Monthly

Weekly

Daily

(Type of AAC)

Almost never

Monthly

Weekly

Daily

(Type of AAC)

\_\_\_\_\_  
Almost never

Monthly

Weekly

Daily

5. In what contexts do you typically use AAC? Check all that apply.

\_\_\_\_ Morning routine

\_\_\_\_ To transition between activities

\_\_\_\_ Mealtime/Snack time

\_\_\_\_ Playtime

\_\_\_\_ Schoolwork

\_\_\_\_ Running errands/ Outside of the house

\_\_\_\_ Bedtime routine

\_\_\_\_ Other: \_\_\_\_\_

6. How satisfied are you with the current use of AAC?

Very dissatisfied   Somewhat dissatisfied   Neutral   Somewhat satisfied   Satisfied

7. In what manner(s) do you communicate with the twins' teacher?

How often?

Please check all that apply.

\_\_\_\_ Face-to-face

Almost never

Monthly

Weekly

Daily

\_\_\_\_ Email

Almost never

Monthly

Weekly

Daily

\_\_\_\_ Phone

Almost never

Monthly

Weekly

Daily

\_\_\_\_ Other: \_\_\_\_\_

Almost never

Monthly

WeeklyDaily

## Appendix B

### SLP Questionnaire

1. Augmentative and alternative communication (AAC) means using some form of communication that is designed to either add to or replace a more typical mean of communication, usually speech. Do you currently use some form of AAC with the twins during therapy?

Yes \_\_\_\_\_

No \_\_\_\_\_

If yes, what kinds are used? Please check all that apply.

☐ No-Tech

☐ Low-tech

☐ Mid-tech

☐ High-tech

☐ Manual signs

☐ Facial expressions

☐ Gestures

☐ Pantomime

☐ Drawings

☐ Picture cards

☐ Picture Exchange

Communication

System (PECS)

☐ Choice Board

☐ Visual Schedules

☐ Social Stories

☐ Speech-generating device (SGD)

☐ Apps of Apple iPad TM

☐ Apps on Apple iPhone TM

☐ Apps on Google

Android TM

Other: \_\_\_\_\_

1. Using the scale below, how often do you use each of the checked AAC options?

—

\_\_\_\_\_

—

Almost never

Monthly

Weekly

Daily

(Type of AAC)

---

Almost never  
Monthly  
Weekly  
Daily  
(Type of AAC)

---

Almost never  
Monthly  
Weekly  
Daily  
(Type of AAC)

---

Almost never  
Monthly  
Weekly  
Daily  
(Type of AAC)

2. In what contexts do you typically use AAC? Check all that apply.

- ☐ To establish a schedule for therapy  
☐ During therapy activities  
☐ To transition between activities  
☐ Snack time  
☐ Playtime  
☐ Other: please describe \_\_\_\_\_

Can an iPad app promote educational team communication and child use of pictures?

4. How satisfied are you with the current use of AAC by the twins?

Very dissatisfied   Somewhat dissatisfied   Neutral   Somewhat satisfied   Satisfied

5. In what manner(s) do you communicate with the twins' parents?

How often? Please check all that apply.

☐ Face-to-face

Almost never

Monthly

Weekly

Daily

☐ Email

Almost never

Monthly

Weekly

Daily

☐ Phone

Almost never

Monthly  
Weekly  
Daily  
\_\_\_\_ Other: \_\_\_\_\_  
Almost never  
Monthly  
Weekly  
Daily

6. How would you rate the amount and quality of your communication with the twins' parents?  
Very dissatisfied    Somewhat dissatisfied    Neutral    Somewhat satisfied    Satisfied  
Why?

7. Please describe your level of expertise with AAC and how often you use AAC with the twins.

8. How frequently do you use AAC with the twins?  
Never  
Less than every other session  
Every other session  
Every session

9. How engaged does twins seem with their devices?  
Disengaged  
Neutral  
Somewhat engaged  
Highly engaged

10. How does their device compare to other AAC options?  
Less effective  
About the same  
More effective  
Cannot tell

11. What difference have you noticed in the twins' communication behaviors?  
Communication behaviors include initiations, requests, and responses.  
\_\_\_\_ Significant decrease in communication behavior  
\_\_\_\_ Slight decrease in communication behavior  
\_\_\_\_ No difference in communication behavior  
\_\_\_\_ Slight increase in communication behavior  
\_\_\_\_ Significant increase in communication behavior

12. What improvements do you think could be made to their devices to make communication more efficient?

## Appendix C

### CONSENT TO PARTICIPATE IN RESEARCH: Parent/sibling

**Title of the Study:** ALL MEANS ALL: Implementation of Augmentative and Alternative Communication as a Gateway to Achievement

You are asked to participate in a research study conducted by Angelina Bassett, Ed.S from Arkansas Tech University. The results from this study will contribute to a dissertation. You agree to participate in this study because you meet the following eligibility criteria:

- You are the parent of a child who use an augmentative and alternative communication (AAC) device
- You use the device with your child on a daily basis
- You are able to participate in a 30 minute to one-hour long interview; or
- You are the sibling of a child who uses augmentative and alternative communication

#### PURPOSE OF THE STUDY

The purpose of this study is to explore the correlation between augmentative communication for students in Northwest Arkansas who have autism and are nonverbal and the placement of these learners in lesser restrictive environments in their neighborhood schools with their siblings, cousins, and peers.

#### PROCEDURES

If you volunteer to participate in this study, you will do the following:

Once informed consent has been obtained from you, you will participate in one 30 minute to one hour long interview. The interview will take place in person at an agreed upon location. The interview will consist of questions relating to your experiences with using your child's device.

NOTE: The interview session will be audio recorded. Participants will not be able to deny consent to record. If the client wishes to not be audio recorded, they may not participate in this study.

#### POTENTIAL RISKS AND DISCOMFORTS AND STEPS TAKEN TO MINIMIZE RISKS AND DISCOMFORTS

1. **Psychological harm:** In order to protect the participants from experiencing any potential psychological harm, such as emotional distress, participants may choose not to elaborate on topics that trigger any discomfort.
2. **Concerns regarding continued services through the agency:** Participants was informed via the informed consent form that participation or non-participation will not affect the services they receive from school or outside therapy services.
3. **Breach of confidentiality:** In order to protect the participants against breach in confidentiality, directly identifying information will be removed from the data collected during the interview. Additionally, the interviews will be held in a private room in an agreed upon location. Data collected from the interview will be scored on a password-protected computer, which only the researcher, Angelina Bassett, and her supervisors, Dr. Christopher Trombly, Dr. John Freeman, and Dr. Christy Smith will have access to.

#### POTENTIAL BENEFITS TO SUBJECTS AND/OR SOCIETY

The data gathered from this interview will contribute to a graduate level dissertation. The findings obtained from this study will also be beneficial for the field of speech-language



pathology and special education in relation to understanding the challenges and needs of parents who have a child who uses an AAC device. If you agree to take part in this study, there are no direct benefits to you. We hope that the information learned from this study will benefit children who use augmentative communication and their parents and school team in the future.

#### CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you was disclosed only with your permission or as required by law.

The interview session will be audio recorded; aside from the recording, notes and data will not be collected. All data collected from the interview will be entered into a password-protected computer, using a number code, rather than your name. Only the primary researchers of this investigation, Angelina Bassett, and her supervisors, Dr. Christopher Trombly, Dr. John Freeman, and Dr. Christy Smith, will have a list linking your name to your assigned code and this information will be kept strictly confidential. Under no circumstances will any of this information be shared with others outside of the primary researchers.

#### PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any time. Participation or non-participation will not affect your child's treatment at school. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which in the opinion of the researcher warrant doing so.

#### IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact Angelina Bassett (principal investigator), Dr. Christopher Trombly or Dr. John Freeman, Dr. Christy Smith (research supervisors).

Angelina Bassett (479-466-9882) or [abassett@sdale.org](mailto:abassett@sdale.org)

Dr. Christopher Trombly : [christopher.trombly@comcast.net](mailto:christopher.trombly@comcast.net)

Dr. John Freeman: [jfreeman44@atu.edu](mailto:jfreeman44@atu.edu)

Dr. Christy Smith: [csmith8658@gmail.com](mailto:csmith8658@gmail.com)

#### RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have any questions regarding your rights as a research subject, contact one of the research supervisors above.

#### SIGNATURE OF RESEARCH SUBJECT

I understand the procedures and conditions of my participation described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

---

Name of Subject

---

Signature of subject/Date

#### CONSENT TO AUDIO RECORD

I understand that the interview will be audio recorded and that it is a requirement for participation.

---

Name of Subject

---

Signature of subject/Date

**STATEMENT AND SIGNATURE OF INVESTIGATOR**

In my judgement the subject is voluntarily and knowingly giving informed consent and possesses the legal capacity to give informed consent to participate in this research study.

---

Signature of Investigator

## **Appendix D**

### **INFORMED CONSENT TO PARTICIPATE IN RESEARCH: Teacher/Speech Therapist**

**Title of the Study:** ALL MEANS ALL: Implementation of Augmentative and Alternative Communication as a Gateway to Achievement

You are asked to participate in a research study conducted by Angelina Bassett, Ed.S from Arkansas Tech University. The results from this study will contribute to a dissertation. You agree to participate in this study because you meet the following eligibility criteria:

- You are the teacher or therapist of a child who use an augmentative and alternative communication (AAC) device
- You use the device with children on a daily basis
- You are able to participate in a 30 minute to one-hour long interview

#### **PURPOSE OF THE STUDY**

The purpose of this study is to explore the correlation between augmentative communication for students in Northwest Arkansas who have autism and are nonverbal and the placement of these learners in lesser restrictive environments in their neighborhood schools with their siblings, cousins, and peers.

#### **PROCEDURES**

If you volunteer to participate in this study, you will do the following:

Once informed consent has been obtained from you, you will participate in one 30 minute to one hour long interview. The interview will take place in person at an agreed upon location. The interview will consist of questions relating to your experiences with using your child's device.

NOTE: The interview session will be audio recorded. Participants will not be able to deny consent to record. If the client wishes to not be audio recorded, they may not participate in this study.

#### **POTENTIAL RISKS AND DISCOMFORTS AND STEPS TAKEN TO MINIMIZE RISKS AND DISCOMFORTS**

1. **Psychological harm:** In order to protect the participants from experiencing any potential psychological harm, such as emotional distress, participants may choose not to elaborate on topics that trigger any discomfort.
2. **Concerns regarding continued services through the agency:** Participants was informed via the informed consent form that participation or non-participation will not affect the services they receive from school or outside therapy services.
3. **Breach of confidentiality:** In order to protect the participants against breach in confidentiality, directly identifying information will be removed from the data collected during the interview. Additionally, the interviews will be held in a private room in an agreed upon location. Data collected from the interview will be scored on a password-protected computer, which only the researcher, Angelina Bassett, and her supervisors, Dr. Christopher Trombly, Dr. John Freeman, and Dr. Christy Smith will have access to.

#### **POTENTIAL BENEFITS TO SUBLECTS AND/OR SOCIETY**

The data gathered from this interview will contribute to a graduate level dissertation. The findings obtained from this study will also be beneficial for the field of speech-language pathology and special education in relation to understanding the challenges and needs of parents who have a child who uses an AAC device. If you agree to take part in this study, there are no direct benefits to you. We hope that the information learned from this study will benefit children who use augmentative communication and their parents and school team in the future.

#### CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you was disclosed only with your permission or as required by law.

The interview session will be audio recorded; aside from the recording, notes and data will not be collected. All data collected from the interview will be entered into a password-protected computer, using a number code, rather than your name. Only the primary researchers of this investigation, Angelina Bassett, and her supervisors, Dr. Christopher Trombly, Dr. John Freeman, and Dr. Christy Smith, will have a list linking your name to your assigned code and this information will be kept strictly confidential. Under no circumstances will any of this information be shared with others outside of the primary researchers.

#### PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any time. Participation or non-participation will not affect your child's treatment at school. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which in the opinion of the researcher warrant doing so.

#### IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact Angelina Bassett (principal investigator), Dr. Christopher Trombly or Dr. John Freeman, Dr. Christy Smith (research supervisors).

Angelina Bassett (479-466-9882) or [abassett@sdale.org](mailto:abassett@sdale.org)

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Dr. Christy Smith: [csmith8658@gmail.com](mailto:csmith8658@gmail.com)

#### RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have any questions regarding your rights as a research subject, contact one of the research supervisors above.

#### SIGNATURE OF RESEARCH SUBJECT

I understand the procedures and conditions of my participation described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Subject

Signature of subject/Date

**CONSENT TO AUDIO RECORD**

I understand that the interview will be audio recorded and that it is a requirement for participation.

Name of Subject

Signature of subject/Date

## **Appendix E**

### **Parent(s) Interview Questions (Adapted from Kranich, 2018)**

#### **BACKGROUND INFORMATION (open ended)**

What is your education level?

How old are the twins?

Have the twins been formally diagnosed?

What is the diagnosis?

At what age were they diagnosed and by whom?

What services are the twins receiving?

What services have they received in the past?

What is their placement in terms of class? (gen ed, resource, structured education classroom)

How does the school address the twins' needs for communication and learning?

Do you have other children? How old? Do they have any learning or speech challenges?

Have you ever considered an out of district placement for either or both of the twins? Why or why not?

#### **INTERVIEW QUESTIONS: Please talk about each son separately when applicable**

1. Discuss the process involved when choosing the twins' communication device:
  - a. Which device do the boys use?
  - b. How long have the boys had their devices?
  - c. How many devices have they had? If they used another device, what was it and what made you change your mind?
  - d. Who assisted you in making the decision on choosing a device?
  - e. What reasons prompted you to choose their particular device?
  - f. Describe the collaborative process between you and the SLP when choosing the device? Was it positive? Were your needs considered? Did you have input?
2. Explain the typical use of the boys' device at home.
  - a. How often do the boys use their devices? Are there times they use it more or less frequently? Does one of the boys use it more than the other?
  - b. What functions of communication do they use when communicating with the device (e.g. requesting attention, commenting, asking questions, etc)? Is one more purposeful than the other?
  - c. During which activities do the boys engage in device use? During which activities do they not use their devices? Talk about each boy separately.
  - d. What are some easy/difficult things for you or others in your family and the boys to communicate about?
  - e. Who do the boys use their device with the most? Why do you think that is the case?
  - f. Do the boys use any other forms of communication? If so, what?
3. Explain the benefits you have observed since they started using their current devices compared to before they began using them.
4. Explain the difficulties you have encountered when attempting to use/program the AAC device. What part of the implementation is the most difficult?
5. Explain the difficulties you have encountered when attempting to use the devices at home.

6. Explain types of training you have received from a speech pathologist or other agency about the boys' devices.
7. Does the device improve the ability for you to communicate with the twins?
8. Did the school personnel receive training? If so, who and what kind of training?
9. What factors do school personnel need to consider when working with students and families who use AAC devices?
10. What does the school do in regards to their communication and participation? What could they do differently?
11. What advice would you give schools about students who are nonverbal and have autism? Parental advice?
12. Any other comments or things you would like to share?

## **Appendix F**

### **Interview with Sibling**

1. How old are you? What is the age difference between you and your brothers?
2. When did you realize that the twins had a different way of communicating?
3. Do you think you treat people differently due to the relationship you have with your siblings? Why or why not.
4. How do you think your life is different (or not different) due to the circumstances of the twins?
5. Do you have any advice for other siblings in a similar situation?
6. Do you think the boys have changed as a result of them receiving devices?
7. Do you know how the devices work? Explain if you do.
8. Do you think the twins are in a good placement at their school? Why or why not.
9. What is your relationship with the twins? How do you communicate, have fun, etc.
10. Anything else that you feel would be important for people to know



## **Appendix G**

### **Interview with Teacher**

1. What degree(s) do you hold and in what areas are you certified to teach?
2. How long have you taught? What areas?
3. How long have you taught the twins?
4. How much, if any, training did you receive on working with students with autism who are nonverbal?
5. How much, if any, training did you receive on the devices?
6. How comfortable to you feel with the devices?
7. What training, if any, would you like to have?
8. What do you enjoy most about working with them?
9. What is your biggest challenge? Why?
10. How do your assistants work with the twins? What are their roles and responsibilities?
11. Do they have any training on the devices? If so, what type?
12. Have you seen a difference in their ability to communicate as a result of receiving devices? If so, explain.
13. How do you envision their progress over time in terms of communication?
14. Do you see the twins changing their Least Restrictive Environment over the course of their educational careers in public school? Why or why not?
15. Do you feel that you have adequate resources in order to provide the twins with what they need in the classroom? Explain.
16. How do you determine progress or the lack thereof in terms of behaviors and communication? Can you explain how you gather and interpret data?
17. Do you work with the parents in terms of using their devices? Explain.
18. How can you work within the parameters you are given to demonstrate what each twin knows through their use of AAC?
19. How do you believe that the data you are collecting (that hasn't been collected through other devices) will assist in making programming decisions (if you believe this to be the case)?
20. Anything else you would like to share

## **Appendix H**

### **Interview with Speech Language Pathologist**

1. How long have you been a SLP? Tell me about your experiences.
2. How much, if any, training did you receive on working with students with autism who are nonverbal?
3. How much, if any, training did you receive on the devices?
4. How comfortable to you feel with the devices?
5. What training, if any, would you like to have?
6. How much training do you have using AAC?
7. What do you enjoy most about working with them?
8. What is your biggest challenge? Why?
9. How long have you worked with the twins?
10. Have you received any training on their particular device? If so from whom and how much?
11. Do you feel comfortable with your training to assist the twins with programming and learning their devices? Explain.
12. Have you seen a difference in their ability to communicate as a result of receiving devices? If so, explain.
13. How do you envision their progress over time in terms of communication?
14. Do you see the twins changing their Least Restrictive Environment over the course of their educational careers in public school? Why or why not?
15. How do you determine progress or the lack thereof in terms of behaviors and communication? Can you explain how you gather and interpret data?
16. Do you work with the parents in terms of using their devices? Explain.
17. How do you believe that the data you are collecting (that hasn't been collected through other devices) will assist in making programming decisions (if you believe this to be the case)?
18. Anything else you would like to share