Current Practices by Speech-Language Pathologists in AAC Assessment and Intervention for Young Children on the Autism Spectrum with Minimal Speech

by

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Abstract

AAC intervention for young children on the autism spectrum requires careful attention to a multitude of decisions including system type, intervention practices, system personalization, and inclusion of the family in every aspect. This survey explored the decision-making of SLPs for young children on the autism spectrum with minimal speech in terms of AAC recommendation, assessment, and intervention, looking into what their current practices are based on factors such as preservice education, AAC system types used, intervention methods, and how families are included. Findings showed that there is a lack of preservice education in both areas of AAC and in autism, and many SLPs are completing CEUs in AAC but few in autism. SLPs are often recommending use of AAC supports for this population, but unaided AAC systems (e.g., manual signs) or pre-programmed high-tech AAC systems are being used more often than customized or personalized high-tech AAC systems. SLPs report often including the family in most aspects of AAC assessment and intervention. Each of these findings suggest current SLPs serving young children on the autism spectrum are utilizing several evidence-based practices for this population, but there is a lack of preservice education and in continuing education courses that can account for clinical practices that do not align with current research. More support for SLPs is needed in the form of stronger preservice education and continuing education courses to eliminate gaps in evidence-based practices and to best serve young children on the autism spectrum who utilize AAC.

Artificial Intelligence (AI) Use Disclosure Statement

In the preparation of this thesis, no Artificial Intelligence (AI) tools were used.

Digital Accessibility Disclosure Statement

In the preparation of this thesis, the following digital accessibility tool was used to ensure this document complies with federal requirements: Word Accessibility Checker. The author acknowledges full responsibility for the intellectual content of this work and has made a good faith effort to comply with digital accessibility requirements in publishing, wherein the nature of the content does not significantly change to do so. Furthermore, all content has been reviewed and revised to meet these requirements prior to final publication.

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Table of Contents

List of Tables

List of Figures

List of Abbreviations

AAC - Augmentative and Alternative Communication

CEU - Continuing Education Unit

PECS - Picture Exchange Communication System

SLP - Speech Language Pathologist

VSD - Visual Scene Display

Introduction

Autism and AAC

According to the Center for Disease Control's findings in 2020, 1 in 36 children receive a diagnosis of autism spectrum disorder (Center for Disease Control, 2020). Autism spectrum disorder is a developmental disorder primarily characterized by deficits in social communication, restricted interests, and repetitive behaviors (American Psychiatric Association, 2025). Social communication challenges can include decreased sharing of interests with others, difficulty appreciating their own & others' emotions, aversion to maintaining eye contact, lack of proficiency with use of non-verbal gestures, stilted or scripted speech, interpreting abstract ideas literally, and difficulty making friends or keeping them (American Psychiatric Association, 2025). Of those children receiving a diagnosis of autism spectrum disorder, it is estimated that approximately 30% will have speech that does not support their communication sufficiently (Anderson et al., 2007). Without adequately supported communication, the child's development is at risk in terms of education, familial and peer relationships, and participation in their communities (Light & McNaughton, 2012). Needs, desires, and emotions can all go unexpressed, leading to frustrations for not only the individual, but for their caregivers as well (American Speech, Language, and Hearing Association, 2025).

Providing augmentative and alternative communication (AAC) intervention, such as a speech-generating device, communication board, or signs, offers individuals that do not primarily use speech different modes to meet their daily communication needs. AAC can be categorized as aided or unaided (American Speech, Language, and Hearing Association, 2025). Aided AAC includes use of an external device or system to support communication, such as a choice or topic board, a visual scene display (VSD), an app on an iPad, or a picture exchange communication system (PECS.) Unaided AAC does not rely on an external system to support communication, but rather uses signs, gestures, facial expressions, or body language to communicate.

A large body of research indicates that access to AAC supports the language and communication development of children on the autism spectrum with minimal speech (Ganz et al., 2012; Iacono et al., 2016). Access to AAC is associated with an increase across communicative and language domains for young children on the autism spectrum with minimal speech, including increasing communicative turns, spontaneous communicative initiations, vocalizations, social interaction, and turn-taking requests, as well as a decreasing challenging behaviors (Chapin et al., 2021; Charlop-Christy et al., 2002; Drager et al., 2006; Schepis et al. 1998, Kravis et al., 2002). Critically, strong evidence suggests that earlier access to aided AAC systems leads to greater gains in social communication and language outcomes, as compared to even slightly delayed access (e.g., six months later; Kasari et al., 2014).

Early Language Development

In typically developing children, early symbolic communication, such as pointing, gesturing, joint attention, making word approximations, or using first words typically occurs in the period of 9-18 months of age (Paul et al., 2018). At this stage, communicative functions primarily exist as a means to facilitate social interaction with their caregivers and express needs. Symbolic gesture use often develops before speech and can persist throughout early development (Capone & McGregor 2004). Children will typically start to combine language concepts to express semantic relationships at around 18-24 months and expand their vocabulary as exposure to language increases (Paul et al., 2018). Around 24-36 months, typically developing children generally begin to use short phrases and a greater diversity of syntactical and morphological structures.

Early Language Learners on the Autism Spectrum

Initial language deficits in individuals on the autism spectrum are primarily characterized by delay (Prelock & Nelson, 2012). Prelinguistic differences can be observed early in infancy, as children on the autism spectrum are less likely to engage in joint attention with their caregivers. Lack of joint attention early in infancy can be a predictor of later deficits in conversational language abilities (Mundy et al. 1990; Charman et al. 2003). Prelinguistic behaviors and social communicative behaviors such as gesture use (showing, pointing, giving) vocalizations, and initiation of communication are also seen less in children on the autism spectrum as compared to same-aged neurotypical peers (Prelock & Nelson, 2012; Boyd et al., 2010). Where typically developing children start producing first words at 9-18 months of age, many children on the autism spectrum begin to produce first words at 38 months of age (Howlin, 2003). Delay in communicative behaviors for early language learners can cause unmet communication needs, impede language acquisition, and cause frustrations for both the communicator and communication partner (Boyd et al. 2010). Early identification allows for access to early intervention services to aid in supporting the individual's language acquisition and support their communication needs.

AAC Intervention for Early Language Learners

Decision-making in AAC system design for children who are early language learners should account for this population's communicative demands, giving them access to a range of developmentally appropriate communicative functions, and should support their language development. According to Romski & Sevcik (2004), AAC intervention for early language learners has the following roles: (a) to augment existing speech, (b) to serve as primary mode of communication output for the early language learner, (c) to offer a method of communicative input from communication partners, and (d) to serve as a language intervention strategy. Access to AAC can augment natural speech and/or serve as primary mode of communication output to support expressing basic wants and needs, communicate feelings, and engage with others in social contexts. When communication partners augment their spoken input to the early language learner by modeling use of the AAC system, AAC can support symbolic language development by increasing vocabulary knowledge, as well as serve as a means for communication partners to model early semantic relations and more complex syntactical structures, morphology, phonological representations of language concepts, and pragmatic functions (Romski & Sevcik, 1996; Beukelman & Mirena 1998; Romski & Sevcik 2004).

In a survey by Thistle & Wilkinson (2015) exploring speech-language pathologists' (SLP) decision-making in AAC system design, it was reported that grid-based aided AAC systems that include core vocabulary are often selected for early language learners. Grid-based systems include vocabulary in separate cells within the AAC display and often represent vocabulary using line drawings. Evidence suggests that these types of AAC systems may be challenging for both typically developing children (Trudeau et al., 2014) and school-age/adolescent children who use AAC (Sutton et al., 2022) to learn and use for communication. Core vocabulary reflect more frequently-used language concepts of typically developing children, and often include more function words and abstract language concepts (Frick Semmler et al, 2024; Laubscher et al., 2020). Targeting these types of vocabulary concepts for early language learners who would benefit from AAC may not be reflective of typical early language development or support developing functional communication skills, compared to more personalized, activity-based focus on nouns, verbs, and social words (Binger et al., 2024; Frick Semmler et al, 2024; Laubscher et al., 2020)

Literature suggests that aided AAC systems that represent vocabulary within contextualized, familiar scenes and allow for quick and easy programming of new vocabulary in the moment may be more supporting of the language and communication development of early language learners, including those on the autism spectrum with minimal speech (Holyfield et al., 2019; Light & Drager, 2007; Light et al., 2019). Visual scene display (VSD) AAC systems represent one type of aided AAC system that may better support communication, language development, and a wider range of communicative functions (Holyfield et al., 2019; Light & Drager, 2007; Light et al., 2019), including for young children on the autism spectrum specifically (Chapin et al., 2021; Laubscher et al., 2022; Laubscher et al., 2019). VSDs have communicative supports embedded in the context by which they naturally occur, either through a familiar digital photograph or video with embedded “hotspots” that play relevant speech output when selected (Holyfield et al., 2019). The contexts included in a VSD should be motivating and familiar to the child (Holyfield et al., 2019). New VSDs and hotspots can also be programmed “just in time” in the moment to support the child in learning language and functional communication, and capitalizing on the child’s interests (Holyfield et al., 2019). VSDs may also be an especially effective type of AAC system design to support learning of first words and developing early semantic relations in contexts meaningful to the child (Light et al., 2019). VSDs can capture interactions within a context to help develop language learning, increase communicative exchange, support social interactions, and build semantic knowledge by introducing a wide range of concepts (Light et al., 2019). Language included in each VSD should be developmentally appropriate for the individual, motivating based on their interests, and meaningful based on their environment (Light et al., 2019).

Family-Centered Practice and AAC Intervention

The Participation Model for AAC assessment highlights the importance of including the individual in decision-making when assessing an individual for AAC implementation, paying close attention to their abilities and interests to provide best outcomes (Beukelman & Mirenda, 2013). For young children who are early language learners, primary caregivers are the best resource to carry out the Participation Model in assessment and intervention, as they are the expert on the child, what is motivating them, and what their interests may be (Mandak & Light, 2018). Families should be included from the beginning of assessment and through every aspect of intervention to be able to provide the best support for their child's communication needs. Professionals should come alongside caregivers and view them as partners in care for the child who would benefit from AAC (Mandak & Light, 2018). Caregivers should be meaningfully included during assessment, AAC system design, and intervention, to ensure that the AAC system is functional based on the child's most frequent communication partners, routines, wants, and needs (Mandak & Light, 2018).

According to Dunst et al. (2007), building relational and participatory practices with caregivers is correlated with more positive outcomes for the family as well as the individual in early intervention practices. Including the individual's caregivers in each aspect of AAC assessment and intervention gives valuable insight to the child's communicative strengths and individual likes or desires (Mandak & Light, 2024). In a study collecting parent perspectives on their child's use of AAC, Laubscher et al. (2024) determined that parents have an overall positive view of AAC, as they perceive its benefits in supporting requests, reducing frustration in the child, supporting conversation topics outside of the current context, and supporting the child's language development by vocabulary building. It is also to be noted that all parents participating in this study expressed the importance on the need for personalization of the AAC system, as well as the understanding that the system that is the right fit at this given time may evolve and change as the child grows (Laubscher et al., 2024). Families of children who use AAC have also expressed that the individual's priorities, preferences, and quality of life are better determined by the individual and their family rather than by a professional (Lund & Light, 2006). It is also imperative to collaborate with families about AAC assessment and intervention processes because of its great impact on the routines of the family. Communication of the family changes if the AAC supports are accessible within the home, which should be taken into account by the clinician (Mandak et al., 2017).

Current Practices in AAC Assessment and Intervention

Overall, research strongly supports that early access to AAC for children on the autism spectrum with minimal speech is beneficial to increase language and communication outcomes (Charlop-Christy et al., 2002; Kasari et al., 2014). However, there is minimal research describing current practices and clinical decision-making related to the provision of AAC and AAC system design for SLPs who work with children on the autism spectrum with minimal speech who are early language learners. It is critical to understand current clinical practices to identify potential research-to-practice gaps, and to determine routes to better guide clinicians in adopting evidence-based practices to most effectively support young children on the autism spectrum with minimal speech and their families.

A study in 2015 by Thistle & Wilkinson investigated SLP decision-making in display design for young children who would benefit from AAC more generally, looking into symbol choice, modifications to the device, and considerations for included AAC vocabulary. While many clinicians reported considering children's and families' preferences in vocabulary selection, most considered this as an additional component to a mainly core vocabulary approach (Thistle & Wilkinson, 2015). Less than half of the participating SLPs reported considering the child's cognitive skills when determining how to represent language concepts symbolically in the AAC system, and the overwhelming majority of SLPs reported using traditional grid displays with line draw symbol representations (very few SLPs reported using VSD AAC systems). Symbols that are more iconic, or more like the actual object (e.g., digital photographs), have been shown to have better language outcomes and are easier to learn than less iconic symbols, like cartoons or more abstract figures (Schlosser & Sigafoos, 2002). Overall, this survey by Thistle & Wilkinson (2015) suggests that most practicing SLPs who are providing AAC assessment and intervention are considering some extent of system individualization for children who use AAC, but that clinical practice in AAC system design for young children is inconsistent across clinicians, and only partially aligns with the empirical evidence.

Research suggests that SLPs working with children on the autism spectrum who utilize AAC primarily focus on communicative functions such as requesting, protesting, greetings, commenting, answering questions, and labeling (Wendelken & Williams, 2023). However, SLPs also reported that they feel it is difficult to incorporate communicative functions other than requesting, which causes feelings of frustration from the SLP (Wendelken & Williams, 2023). The SLPs also described that their process of beginning intervention with children on the autism spectrum who utilize AAC focused on teaching requesting by finding a desired or preferred object to create communication motivation. These SLPs characterized their biggest challenge when working with this population as a perceived lack of motivation by the children on the autism spectrum to communicate. Engaging in social interactions is crucial to support language development (Paul et al., 2018). When targeting requesting, the interaction ends when the requested object is received, not supporting any further social interaction (Wendelken & Williams, 2023). It is critical that AAC intervention with young children on the autism spectrum intentionally target communicative functions beyond requesting, especially as social pragmatics are inherently an area of challenge for children with a diagnosis of autism.

When considering practices in AAC system personalization, according to a study by Clarke & Williams (2018), most SLPs who provide AAC intervention to individuals on the autism spectrum are taking into consideration the client's strengths when personalizing a device more so than their specific diagnosis. However, participating SLPs also reported that their primary target in intervention was modeling the pre-programmed AAC device, as opposed to personalizing the AAC system (Clarke & Williams, 2018). While providing this type of aided AAC input can support language and communication development (O'Neill et al., 2018), infrequent programming of individualized and personally relevant vocabulary can limit access to language as early language learners continue to develop their language skills over time (Light et al., 2019). The complex learning demands for children who are early language learners and would benefit from AAC, paired with the time-consuming nature of traditional, grid-based AAC technology, creates significant barriers for professionals to add personalized vocabulary or train caregivers to do so, leading to infrequent personalization of traditional aided AAC systems (Light et al., 2019).

Donato et al. (2018) highlights additional barriers reported by SLPs who provide assessment and intervention in AAC, including: (a) lack of preservice training in AAC for clinical providers, (b) difficulty accessing appropriate professional development training in AAC, (c) difficulty in measuring child's progress, (d) inconsistent advice from other clinical providers related to AAC assessment and intervention, and (e) inconsistent access for children to

AAC systems across environments (Donato et al., 2018). In a study by Laubscher et al. in 2024, parents reported barriers in implementing AAC in daily life, including: (a) difficulty in maintenance of high-tech AAC systems, (b) inconvenience of many aided AAC systems, and (c) the time-consuming nature of learning complex aided AAC systems. Maintenance of the AAC system ranged from ensuring it has full battery to its susceptibility to damage, both of which add to the cognitive load of the caregiver. Parents reported struggling to remember to bring the device with the child, contributing to its inconvenience. Adjusting and re-programming the device to add new vocabulary or make changes based on given communicative contexts or demands was also challenging for parents, as they felt many systems are difficult to navigate. When supporting their child who uses AAC, parents also described a significant learning curve and an unmet need for education in intervention techniques, causing frustration and further barriers (Laubscher et al., 2024).

To date, no research has directly explored how SLPs are making decisions regarding whether or not to recommend AAC for young children on the autism spectrum whose natural speech does not meet their communication needs, or what guides the characteristics of AAC supports that they do recommend. Research clearly indicates that AAC is an appropriate language and communication support for any individual whose natural speech does not meet their communication needs, yet there is a widely believed myth that AAC intervention is seen as a last resort or requires some level of prerequisite skills (Romski & Sevcik, 2004). Early access to evidence-based, developmentally appropriate AAC systems is crucial to support young children on the autism spectrum with minimal speech in their early language development (Light et al., 2019). The purpose of this proposed study is to explore the decision-making process related to provision of AAC supports by SLPs serving early intervention and preschool-age children on the autism spectrum with minimal speech, by addressing the following research questions: (1) What are the education background and self-reported knowledge of current SLPs regarding autism and AAC?; (2) What are current practices of SLPs in terms of considering recommending AAC supports for young children on the autism spectrum with minimal speech?; (3) What types of AAC systems, intervention strategies, and communicative functions do SLPs typically include in intervention with young children on the autism spectrum with minimal speech?; (4) How are SLPs' clinical experience and training in AAC and autism related to their clinical practice in AAC?; (5) How do SLPs incorporate families into assessment and intervention for children on the autism spectrum with minimal speech who would benefit from AAC? The long-term goal of this research is to establish future research directions and to identify potential gaps in current clinical practices, to better support SLPs in providing effective AAC intervention to young children on the autism spectrum with minimal speech.

Methods

Participants

SLPs working with young children on the autism spectrum between the ages of one and five were recruited to complete an anonymous online survey. Inclusion criteria were the following: a) a practicing speech-language pathologist or speech-language pathology assistant in the United States, b) children on current caseload age five or younger with a confirmed or suspected diagnosis of autism spectrum disorder, and c) access to internet or a mobile device to complete the survey. The survey was not advertised as specifically addressing AAC practices for young children on the autism spectrum, or children on the autism spectrum with minimal speech – only clinical experience working with young children on the autism spectrum five or younger. Thus, SLPs who focused on AAC provision for this population or worked specifically with children with minimal speech were not necessarily more likely to participate.

Procedures

Upon approval from the Institutional Review Board, the recruitment flyer for the study was shared on ASHA Special Interest Group forums (e.g., augmentative and alternative communication, early intervention, autism spectrum disorders), via Facebook groups, and through email directly to speech-language pathology clinics with a link/QR code to the survey. Surveys were completed anonymously through Qualtrics. All survey responses were critically assessed to determine whether any responses may have been from individuals who were not the target demographic (e.g., inconsistent responses, always selecting the first response for every question). All such responses were removed from analyses. Data from survey responses were downloaded into an Excel file for analyses and visualization. Descriptive statistics were completed in Excel. Exploratory correlational analyses were completed using the R statistical package.

Materials

A secure, online anonymous survey was created via Qualtrics software. Questions address the following: (a) participant demographics (geographic location, race/ethnicity, sex/gender, age, and how long participants had been practicing); (b) characteristics of clients on caseload; (c) education and experience related to autism and AAC intervention; (d) current clinical practices in AAC intervention, and (e) the incorporation of family-centered practice. Two licensed speech-language pathologists with expertise working with young children on the autism spectrum with minimal speech provided feedback on the initial survey draft, which was edited based on their responses. See Appendix A for survey questions. Addition open response questions were also included in the survey. Analysis of these responses is not included in the current results and analyses.

Data Analysis

Survey data were analyzed using descriptive statistics to characterize typical practices in AAC assessment and intervention. Post-hoc correlational analyses were completed to explore potential relationships between study variables related to participants' reported AAC and autism experience and their AAC provision practices. Given the ordinal nature of the data, Spearman's rank-order correlation analyses were conducted to investigate potential relationships between variables, and included the following variables: (a) number of years practicing; (b) years of autism experience; (c) experience working with children on the autism spectrum with minimal speech; (d) AAC experience; (e) graduate coursework in autism or AAC; (f) frequency completing continuing education units (CEUs) in autism or AAC; (g) percentage of children on the caseload on the autism spectrum; (h) percentage of these children with minimal speech; (i) how often AAC supports are recommended for this population; (j) when in the assessment/intervention process AAC is recommended; (k) how often AAC systems are customized or modified; and (l) percentage of children within this population on the caseload who have access to their own personal AAC system.

Results

In total, 80 valid survey responses were collected. Out of the 80 responses, 4 responses were excluded from analysis due to incomplete responses beyond the basic demographic information, making the total amount of analyzed responses 76. All 76 participants provided demographic and employment information, completed all survey questions about their training and experience working with children on the autism spectrum and with AAC, and answered questions related to how often and when they introduce AAC. All but two participants answered survey questions about systems, strategies, and access to AAC, with 63 of those participants also answering questions about how often they modify children's AAC systems. Three quarters of the total participants (57) completed the survey in its entirety, also answering the final questions about family centered practice. The results reported within each section reflect the total number of respondents for the questions within that section.

Demographics

Participants reported working across various regions of the United States with 30 different states represented (see Appendix B). Of the 76 responses, 78% participants described their race as white, where 8% described their race as Black, 7% as Hispanic or Latino/a, 2% as Asian, and only one participant described themself as American Indian or Multiethnic, respectively. Six participants selected two or more racial/ethnic categories (e.g., Hispanic or Latino/a and white). In terms of age, the most represented age group participating was age 26-35, making up 28% of responses, followed by 36-45 (27%), 46–55 (21%), 56-65 (11%), 25 or younger (8%), and 66+ made up the remaining 5% of responses.

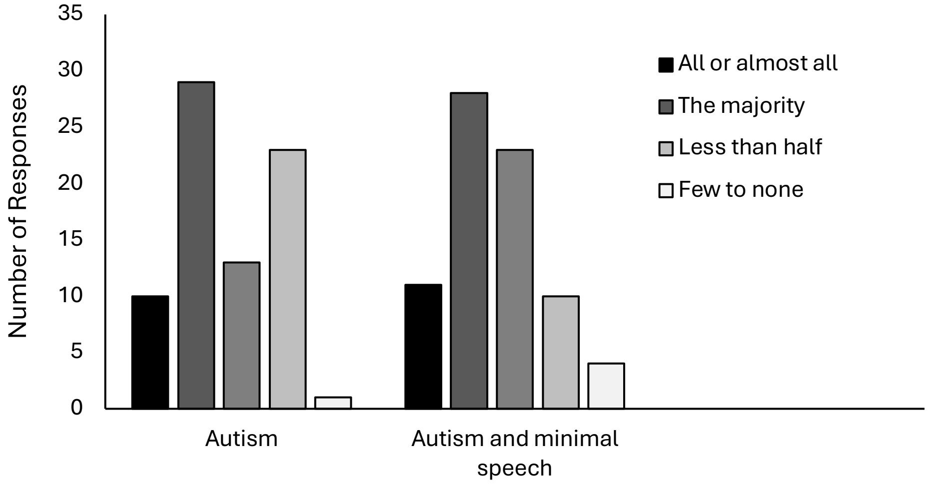
When looking at years of experience, participants with 21 years or more accounted for 30% of the responses. Those with 6-10 years of experience made up 20% of respondents, followed by 3-5 years of experience (16%), 11-15 years of experience (14%), 0-2 years of experience (12%), and 16-20 years of experience (8%). All participants but two were female (97%). The majority of respondents (71) had their CCC-SLP licensure and the remaining five were CF-SLPs. In terms of setting, 50% of respondents reported working in a school setting, 36% provide in-home services, 26% worked in a private practice, 21% in outpatient, 7% in telepractice, and 10% described their setting as "other." However, participants were able to select multiple options and 41% (31) indicated that they worked in more than one setting. When describing service delivery model, the majority (83%) described their practice as all in person, whereas 14% were most in-person and some telehealth, and 3% were equal amounts of in-person to telehealth. See Appendix C for a comprehensive table of participant demographics.

Caseload Characteristics

Participants were asked to describe their typical caseload in terms of the proportion of children they typically worked with on the autism spectrum and how many of these children used minimal speech (see Figure 1). Thirteen percent of participants said that all or almost all of their caseload are young children on the autism spectrum, 38% said that this describes the majority of their caseload, 18% said that this population makes up about half of their caseload, 30% said less than half of their caseload are young children on the autism spectrum, and only one respondent said that they have few to no young children on their caseload on the autism spectrum. Of those young children on the autism spectrum, participants were asked approximately how many have minimal speech. Fourteen percent reported that this describes all or almost all of the young children on the autism spectrum on their caseload, 37% said the majority have minimal speech, 30% said this describes about half of the young children on their caseload on the autism spectrum, 13% say that less than half have minimal speech, and 5% said that few to none have minimal speech (see Figure 1).

Figure 1

Caseload Characteristics



Participants were also asked how many of the young children on the autism spectrum with minimal speech on their typical caseload have access to their own personal aided AAC system. Nineteen percent said all or almost all have their own AAC devices, 16% said the majority, 18% said about half, 26% said less than half, and 18% said few to none (see Figure 2). Of those who have their own aided AAC system, the most common funding source was insurance (64%), followed by the school system (34%), paid for by families themselves (21%), other funding sources (13%) and grant funding (9%; see Figure 3).

Figure 2

How Many Children on Caseload Have Access to Their Own High-Tech AAC System

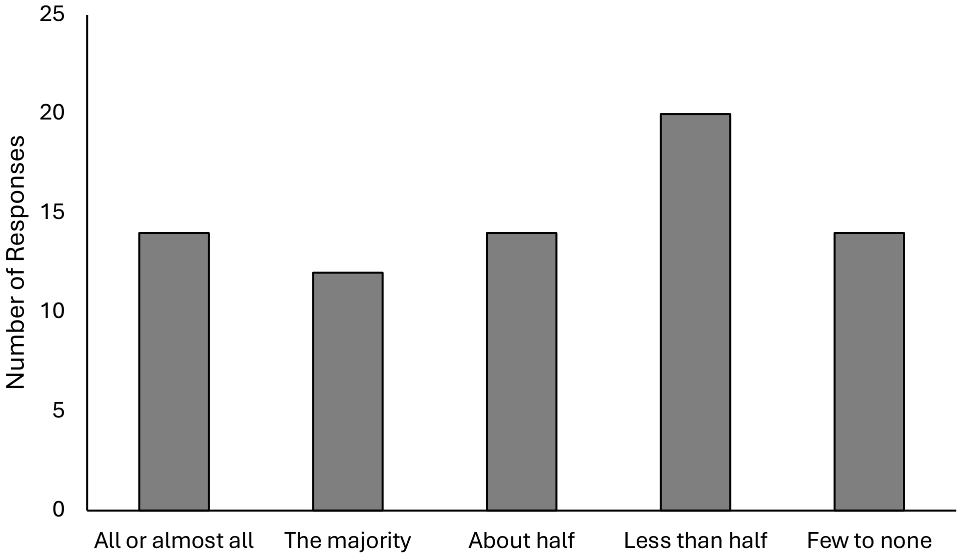
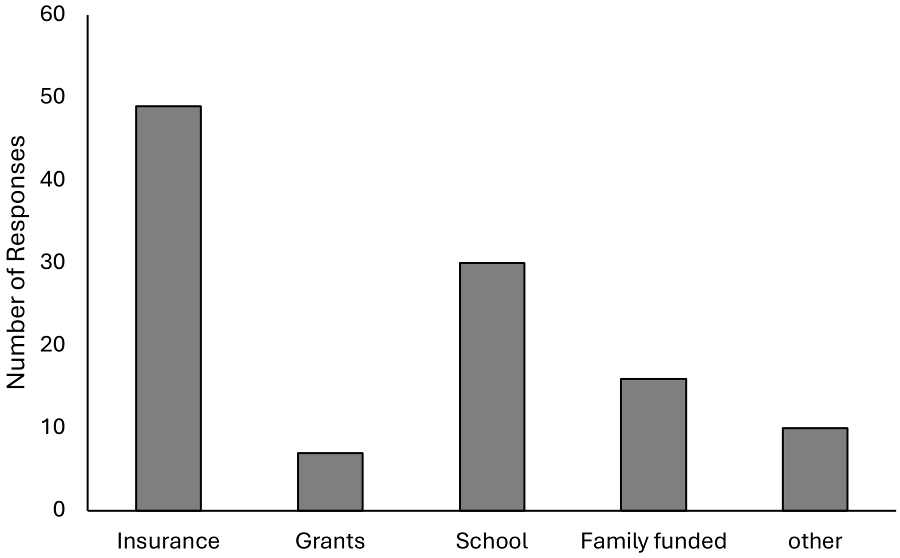


Figure 3

Funding Sources for Personal High-Tech AAC Systems



Knowledge and Experience

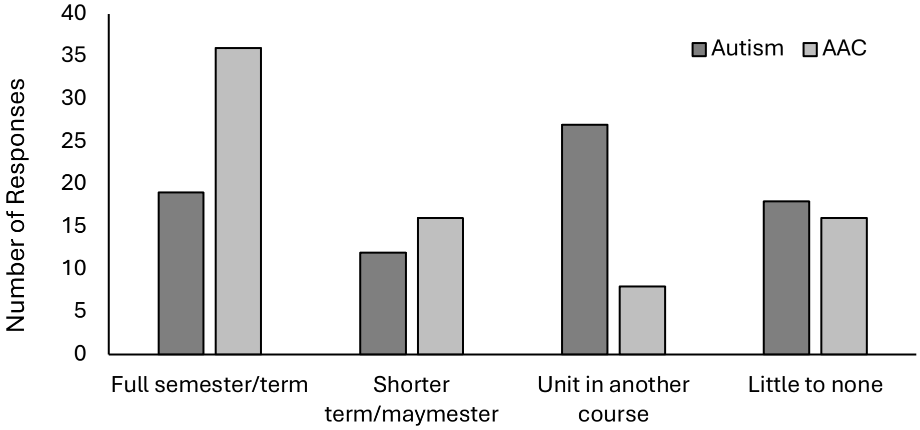
Research Question 1: What are the educational backgrounds and self-reported knowledge of current SLPs regarding autism and AAC?

Participants were asked about their total years practicing clinically, as well as their experience related to working with children on the autism spectrum specifically. For total years of clinical practice, 12% reported 0-2 years of experience, 16% had 3-5 years, 20% had 6-10 years, 14% had 11-15 years, 9% had 16-20 years of experience, and 30% of participants reported 21+ years of experience. In terms of experience working with children on the autism spectrum specifically, 12% stated 0-2 years of experience, 15% had 3-5 years, 26% had 6-10 years, 12% had 11-15 years, 7% had 16-20 years, and 28% had 21+ years of experience.

Participants were asked how much coursework they received in both autism and in AAC during their graduate studies (see Figure 4). For coursework in autism, 25% said they have a full-semester/term course, 16% had a short-term/May-mester course, 36% had a unit in another course, and 24% said to have little to no coursework. For coursework in AAC, 47% said they have a full-semester/term course, 21% had a short-term/May-mester course, 11% had a unit in another course, and 21% said to have little to no coursework in AAC.

Figure 4

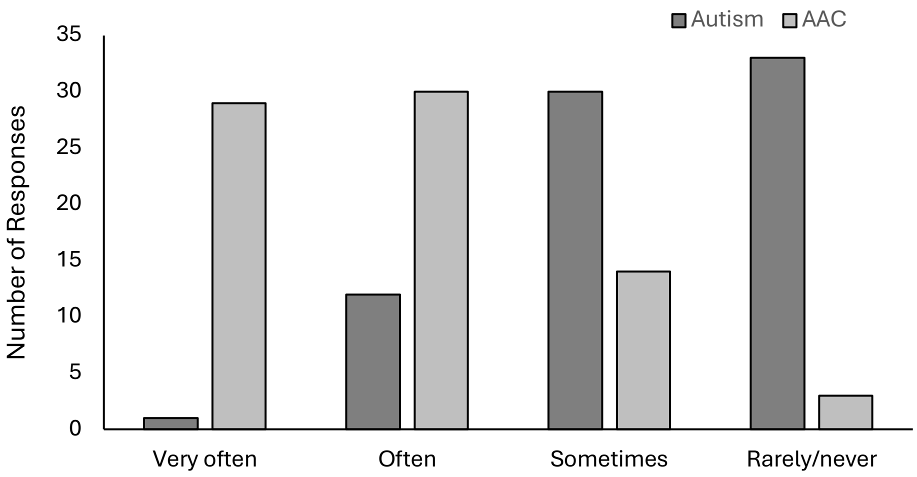
Preservice Training in Autism and AAC



Participating SLPs were asked about their completion of continuing education units (CEUs) in regard to autism and AAC (see Figure 5). Only one participant reported that they very often complete CEUs in autism, 16% said they complete CEUs in autism often, 40% reported sometimes, and 43% said they rarely or never complete CEUs in autism. Thirty-eight percent of respondents said they very often complete CEUs in AAC, 40% said they complete CEUs in AAC often, 18% stated that they sometimes complete CEUs AAC, and 4% said they rarely or never complete CEUs in AAC.

Figure 5

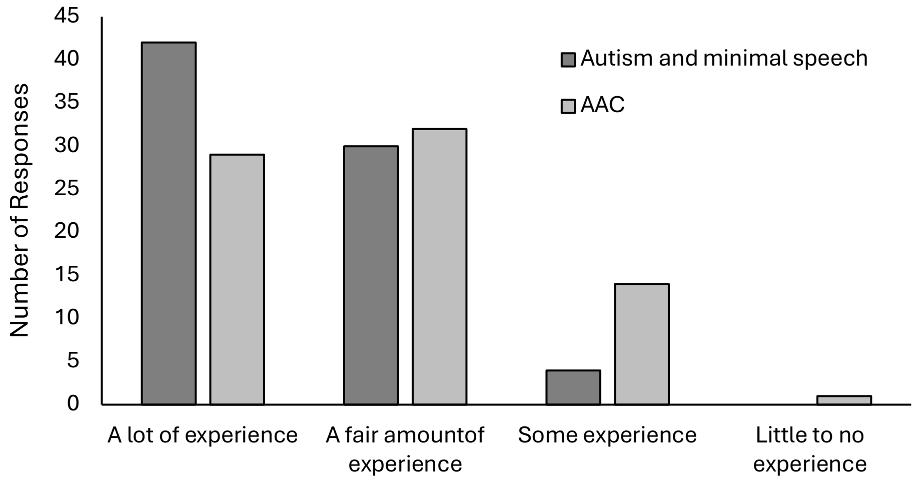
Frequency of Completing Continuing Education Units in Autism and AAC



Participants were also asked to self-report their own experience level with children on the autism spectrum with minimal speech as well as with AAC intervention (see Figure 6). In experience with children on the autism spectrum with minimal speech, no participants reported to have little to no experience. Six percent indicated that they had some experience, 39% said they had a fair amount of experience, and 55% said they had a lot of experience. In experience level with AAC intervention, one participant report to have little to no experience, 18% said they had some experience, 42% said they had a fair amount of experience, and 39% said they had a lot of experience.

Figure 6

Clinical Experience Working with Children with Minimal Speech or AAC



Current Practices in AAC Recommendation and Intervention

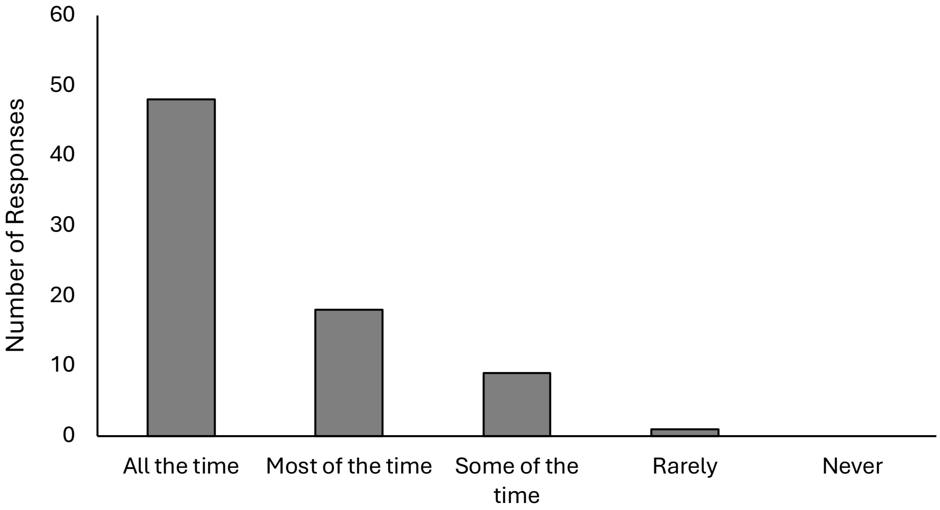
Research Question 2: What are current practices of SLPs in terms of considering recommending AAC supports for young children on the autism spectrum with minimal speech?

Research Question 3: What types of AAC systems, intervention strategies, and communicative functions do SLPs typically include in intervention with young children on the autism spectrum with minimal speech?

Clinicians were asked to describe their practices in recommending and incorporating AAC into their clinical practice for young children on the autism spectrum with minimal speech. Participants were asked how often they recommend AAC supports for this population, where 63% said they incorporate AAC supports all the time, 24% said they incorporate it most of the time, 12% say they incorporate AAC some of the time, and only one participant said they rarely or never incorporate AAC supports (see Figure 7).

Figure 7

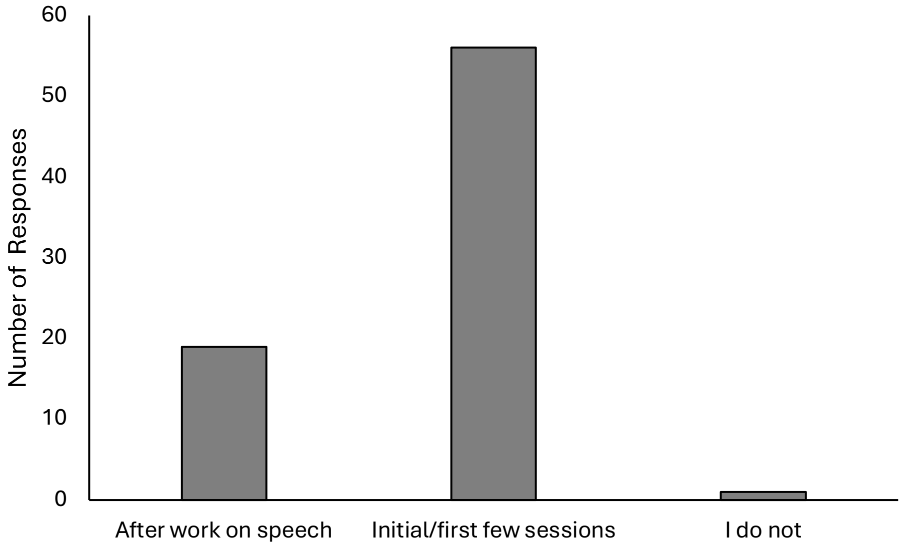
How Often Clinicians Incorporate or Recommend AAC Supports



Additionally, participants were asked when they typically recommend AAC supports (see Figure 8). Three quarters (74%) reported that they recommend AAC in the initial/first few sessions, 25% say they recommend AAC after they work on speech, and only one participant said that they do not recommend AAC. This was the same participant who reported that they rarely incorporate AAC supports into intervention for this population.

Figure 8

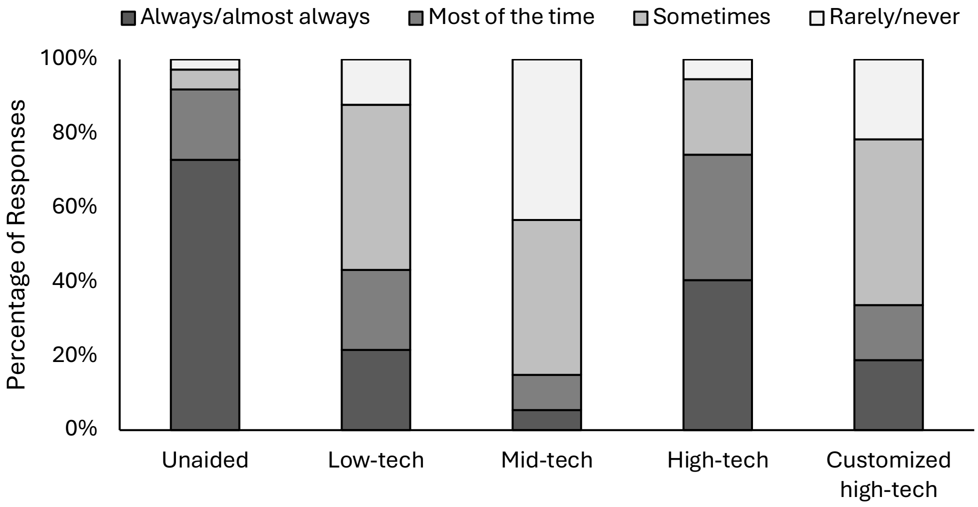
When During Intervention Clinicians Recommend or Incorporate AAC Supports



Participants were also asked how often they recommend or incorporate into therapy different types of AAC supports when working with young children on the autism spectrum with minimal speech (see Figure 9). These AAC types include unaided AAC (e.g., manual signs and symbolic gestures), low-tech (e.g., picture exchange, topic boards), mid-tech (e.g., single buttons or static arrays with speech output), high-tech (e.g., iPad apps with dynamic pages of vocabulary and speech output), and custom high-tech devices (visual scene displays, customized grid-based systems). Seventy-two percent said they always/almost always incorporate unaided AAC, 19% said they incorporate it most of the time, 6% said they incorporate it sometimes, and 3% said they incorporate unaided AAC rarely or never. Twenty-one percent said they incorporate low-tech AAC always/almost always, 21% said they incorporate it most of the time, 43% said they incorporate it sometimes, and 15% said they rarely or never incorporate low-tech AAC. Five percent said they incorporate mid-tech AAC always/almost always, 9% said they incorporate it most of the time, 41% said they incorporate it sometimes, and 45% said they rarely or never incorporate mid-tech AAC. Only 40% said they always/almost always incorporate high-tech AAC, 33% said they incorporate it most of the time, 21% said they incorporate it sometimes, and 6% said they rarely or never incorporate high-tech AAC. A total of 19% of participants said they always/almost always incorporate customized high-tech AAC, 15% said they incorporate it most of the time, 44% said they incorporate it sometimes, and 23% said they rarely or never incorporate customized high-tech AAC.

Figure 9

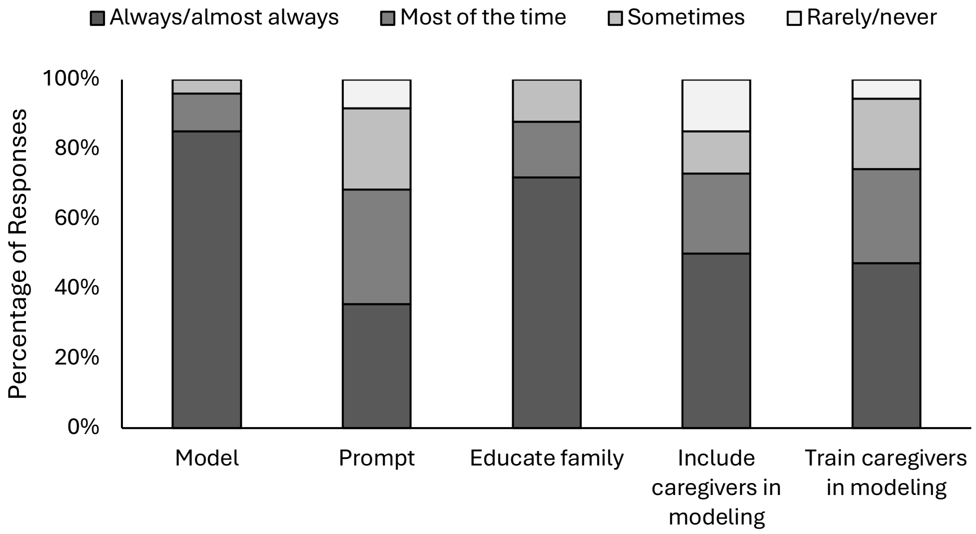
How Often Clinicians Incorporate Different Forms of AAC Supports



Clinicians were also asked how often they use the following strategies related to AAC intervention: (a) modeling use of the child's AAC system; (b) prompting the child to use the AAC system; (c) educating families about their child's AAC system; (d) including caregivers in modeling the AAC system for their children; and (e) training caregivers in how to model using the AAC system at home (see Figure 10). Eighty-five percent of participants said that they always/almost always model AAC supports, 11% said they model most of the time, and 4% said they sometimes model. None said they rarely/never model AAC supports. Thirty-six percent of clinicians always or almost always prompt the child to use AAC supports, 33% prompt most of the time, 23% sometimes prompt, and 8% rarely to never prompt the child to use AAC supports. Seventy-three percent of respondents said they always or almost always educate the family about their child's AAC supports, 16% did this most of the time, 11% said sometimes, and none said they rarely/never educate the family. Half of respondents reported to always/almost always included the caregiver in modeling the AAC supports during therapy sessions, 23% included the caregiver in modeling most of the time, 12% said sometimes, and 15% said they rarely/never included the caregiver in modeling AAC supports. Of the total participants answering this question, 47% reported to always/almost always train the caregiver in modeling AAC supports in daily routines outside of the therapy session, 27% did this most of the time, 20% sometimes, and 6% rarely/never trained the caregiver in modeling in contexts outside the therapy room.

Figure 10

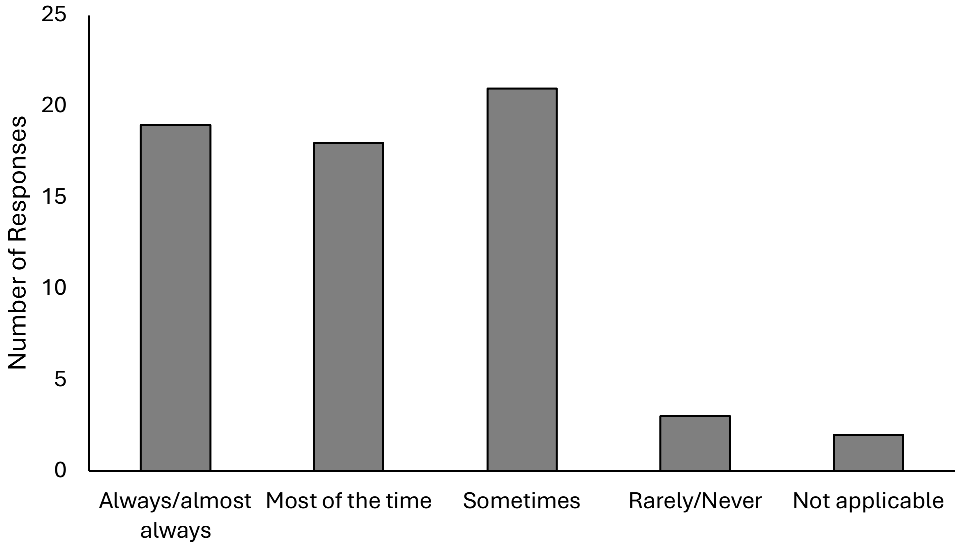
How Often Clinicians Incorporate Different AAC Intervention Strategies



When asked how often modifications are made to the child on the autism spectrum's AAC system, 30% said they always/almost always do this, 29% said they do this most of the time, and 33% stated that they make modifications some of the time. Only three participants said that they rarely/never make changes and only two participants said this question was not applicable (see Figure 11). It is to be noted that 83% of participants opted to answer this question (63 respondents of 76 study participants).

Figure 11

How Often Clinicians Modify Children's AAC System



Correlation Results

Research Question 4: How are SLPs' clinical experience and training in AAC and autism related to their clinical practice in AAC?

Post-hoc correlational analyses revealed several potential relationships between variables related to participants' reported AAC and autism experience and their AAC provision practices (see Table 1). Of the 76 total participants, 60 responded to all of the relevant survey questions, and were included in these analyses (79%). It is important to stress that these results are exploratory in nature and did not represent the entire dataset.

SLPs who had been practicing longer were less likely to have comprehensive coursework in autism or AAC. Participants who reported more autism experience also had less comprehensive coursework in both autism and AAC. Though nonsignificant, years practicing and autism experience had a high correlation coefficient, which may suggest that many of these same participants who had been practicing longer also had more experience working with young children on the autism spectrum, perhaps simply as a function of their longer time in the profession.

SLPs with more experience working with children on the autism spectrum with minimal speech reported completing fewer CEUs in autism. However, they were more likely to report recommending AAC for this population, recommending it early in intervention, and customizing children's AAC systems. These relationships were not observed for SLPs who reported more experience with children on the autism spectrum generally. Conversely, participants who reported more AAC experience were more likely to have completed CEUs in AAC. These participants were also more likely to recommend AAC, recommend it early in the intervention process, and customize children's AAC systems. However, SLPs who completed more CEUs in AAC were actually less likely to complete CEUs in autism – one of the strongest significant correlations within the data. The SLPs who recommended AAC supports more often were also more likely to report providing customized AAC systems and modified high-tech AAC systems. Unfortunately, SLPs who reported these practices of recommending AAC supports early, customizing AAC systems, and modifying their clients' AAC systems were less likely to have clients with their own personal AAC systems.

Table 1

Correlations Between Variables Related to AAC/Autism Experience and AAC Clinical Practice (N = 60)

Variables	Median Response	Years Practice	Autism Exper.	Min Speech Exper.	AAC Exper.	Course Autism	Course AAC	CEUs Autism	CEUs AAC	% Autism	% Min. Speech	Recom. AAC	When Recom. AAC	Custom AAC	Personal AAC
Years Practice	6-10 years														
Autism Exper.	6-10 years	0.84													
Min. Speech Exper.	A lot	0.24	***0.37*****												
AAC Exper.	Fair amount	-0.08	0.13	0.51											
Course Autism	Unit in another course	***-0.39*****	**-0.32***	-0.19	-0.14										
Course AAC	Maymester	***-0.41*****	***-0.36*****	-0.07	0.13	***0.44*****									
CEUs Autism	Sometimes	-0.14	-0.23	***-0.34*****	-0.06	-0.09	0.10								
CEUs AAC	Often	0.08	0.17	0.24	***0.36*****	-0.01	-0.18	***-0.44*****							
% Autism	Less than half	-0.20	-0.20	0.09	0.19	-0.04	0.00	-0.12	-0.08						
% Min. Speech	Less than half	0.00	0.05	0.12	0.21	-0.11	-0.11	0.08	0.20	0.15					
Recom. AAC	All of the time	-0.14	0.00	**0.27***	***0.42*****	0.12	0.14	-0.12	***0.41*****	0.06	0.18				
When Recom. AAC	Initial/first few sessions	0.03	0.13	**0.29***	***0.39*****	0.08	0.01	-0.11	***0.37*****	0.09	-0.02	0.63			
Custom AAC	Most of the time	0.03	0.06	**0.30***	***0.43*****	-0.04	0.07	-0.19	**0.30***	0.08	-0.09	**0.30***	0.26		
Personal AAC	About half	0.03	0.07	-0.01	-0.25	-0.14	-0.04	0.17	***-0.34*****	0.09	0.05	-0.22	**-0.28***	***-0.34*****	
Modify AAC	Most of the time	-0.04	-0.14	-0.08	0.11	-0.07	0.12	-0.01	0.25	-0.22	0.18	**0.26***	0.04	0.20	***-0.35*****

Note. ***Significance at the 0.05 level**. *****ignificance at 0.01***. Years Practice: total years practicing; Autism Exper.: years of experience with young children on the autism spectrum; Min. Speech. Exper.: amount of experience with children on the autism spectrum with minimal speech; AAC Exper.: amount of experience with AAC intervention; Course Autism: length of graduate course in autism; Course AAC: length of graduate course in AAC; CEUs autism: frequency of completing continuing education units in autism;

CEUs AAC: frequency of completing continuing education units in AAC; % Autism: percent of typical caseload on the autism spectrum; % Min. Speech: percent of typical caseload on the autism spectrum with minimal speech; Recom. AAC: frequency of recommending AAC for children on the autism spectrum with minimal speech; When Recom. AAC: at what point in intervention AAC is recommended; Custom AAC: frequency of using customized/personalized high-tech AAC systems in intervention for young children on the autism spectrum with minimal speech; Personal AAC: percentage of children on caseload with minimal speech who have access to a personal high-tech AAC system; Modify AAC: frequency of making modifications to AAC systems for a particular child.

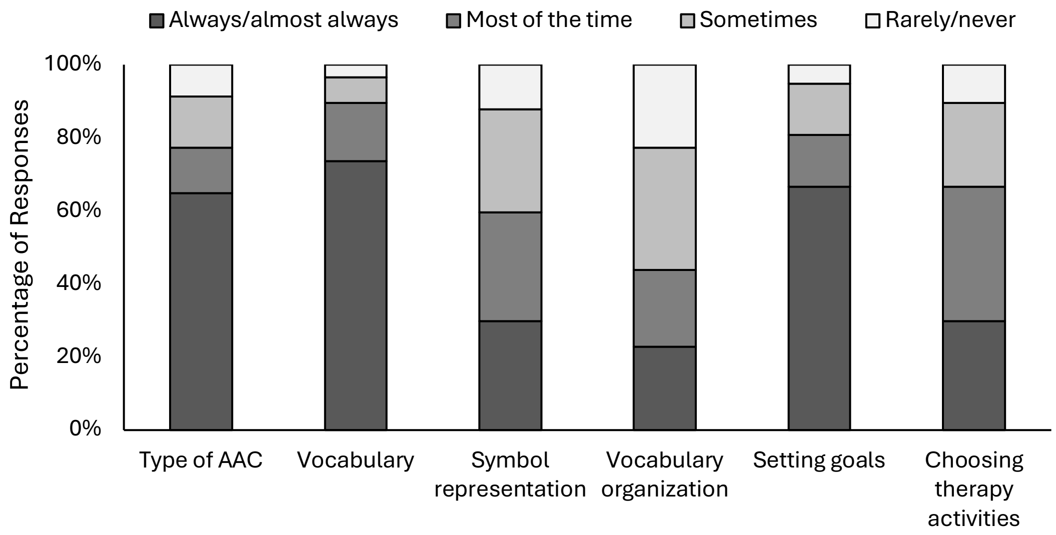
Family-Centered Practice in AAC Decision Making

Research Question 5: How do SLPs incorporate families into assessment and intervention for children on the autism spectrum with minimal speech who would benefit from AAC?

Participants were asked to describe how often they included the child on the autism spectrum's family in the following aspects of AAC assessment and intervention: (a) selecting the type of AAC supports for the child; (b) selecting vocabulary to target/include in the AAC system; (c) selecting how to represent vocabulary concepts within the AAC system (symbol representation); (d) determining how to organize vocabulary within the AAC system; (e) deciding what goals to target in intervention; and (f) selecting activities within which to target these goals (see Figure 12). For this section of questions, 75% of the total study participants opted to respond (57 out of 76). Out of those responding, 65% said they always/almost always incorporate the family in selecting the type of AAC supports, 12% said they did this most of the time, 14% said they do sometimes, and 9% said they rarely/never incorporate the family in selecting the type of AAC supports. Seventy-four percent said that they always/almost always included the family in selecting vocabulary to target/include in the system, 16% said they did most of the time, 7% said they do sometimes, and 4% said they rarely/never included the family in selecting vocabulary. Thirty percent of participating clinicians said that they always/almost always included the family in selecting symbol representations, 30% said they did this most of the time, 28% said they did sometimes, and 12% said they rarely/never included the family in selecting symbol representation. Twenty-three percent said they always/almost always incorporated the family in determining how to organize vocabulary within the AAC system, 21% said they did this most of the time, 33% said they did sometimes, and 23% said they rarely/never incorporated the family in determining vocabulary organization. Sixty-six percent of respondents said they always/almost always include the family in selecting goals to target, 14% said they did most of the time, 14% said they did sometimes, and 5% said they rarely/never included the family in goal selection. Thirty percent of respondents said that they always/almost always incorporated the family in selecting activities by which to target goals in intervention, 37% said they did this most of the time, 23% said they did sometimes, and 11% said they rarely/never incorporated the family in selecting therapy activities.

Figure 12

How Often Clinicians Include the Family in AAC Decision Making



Discussion

For children ages 1-5 on the autism spectrum with minimal speech, access to aided AAC supports allows for an increase in language development by an increase in communicative turns, spontaneous communicative initiations, vocalizations, turn-taking requests, and shows a decrease in challenging behaviors (Chapin et al., 2021; Charlop-Christy et al., 2002; Drager et al., 2006; Schepis et al. 1998, Kravis et al., 2002). AAC intervention for early language learners serves the following roles: (a) to augment existing speech, (b) to serve as primary mode of communication output for the early language learner, (c) to offer a method of communicative input from communication partners, and (d) to serve as a language intervention strategy. (Romski & Sevcik, 2004). The results of this study suggest that the current practices of speech-language pathologists serving young children on the autism spectrum with minimal speech generally align well in many ways with the research evidence in terms of AAC recommendation, assessment, and intervention. However, several areas were identified that suggest potential gaps in current clinical practices and preservice training. While overall promising, attention to these areas in both research and practice is critical to better support the efficacy of AAC intervention by clinicians working with young children on the autism spectrum with minimal speech.

Clinical Experience and Education

Over half of clinicians who participated in the study indicated that they had only either a unit in another course discussing autism topics, or little to no coursework in autism. Only 16 participants stated to have had a full semester course focused on autism. Less than half of the participants had a full-term course in AAC, with 32% reporting that they had only one unit or no instruction during their preservice training. These findings may be attributable to the wide range of communication disorders that must be addressed within speech-language pathology training programs, with autism only representing one condition to be addressed. However, prevalence in autism has increased to 1 in 36 children in the United States, so appropriate preservice education is critical in developing a clinician prepared to best serve all individuals. AAC services may be required across almost the entire spectrum of people that SLPs work with, so this lack of training is not only distressing when considering children on the autism spectrum, but the field generally. Correlation data did reveal a promising trend that amount of coursework in both areas is increasing with time, as clinicians who have been practicing for fewer years report more comprehensive coursework in AAC and autism.

Over two thirds of participants indicated that they are completing continuing education unit (CEU) courses in AAC either often or very often, with very few claiming to rarely/never complete AAC CEU courses. Completing AAC CEUs as well as self-reported AAC intervention experience were both correlated with provision of more supportive and evidence-based practice for young children on the autism spectrum with minimal speech, by recommending AAC, recommending it early in the intervention process, and customizing children's systems. This suggests that those who seek out continuing education in AAC are using evidence-based practices surrounding recommending AAC supports. Both added training through participating in CEUs and increased clinical experience in AAC intervention may improve clinician's knowledge about the importance of AAC and AAC personalization, as well as their own perceived self-efficacy to adapt pre-programmed AAC systems or create customized systems for their clients.

However, it is important to note that correlation analyses only comprised the participants who completed all questions included within these analyses, representing 79% of the total participants (60 out of 76). One of the critical variables appeared later in the survey ("How often do you make modifications to a child on the autism spectrum's aided AAC system (low-tech or high-tech)?") and had the lowest response rate within the variables included in the correlation analyses (63 respondents). The lower response rate for this question is unknown, but it may be that SLPs who were less likely to modify their clients' AAC systems were less likely to respond. If so, this may have skewed the results of correlation analyses toward participants from the total sample who were more likely to modify and customize AAC systems for young children on the autism spectrum with minimal speech. Thus, the results of the post-hoc exploratory correlation analyses should be interpreted with some caution, as it is possible that some positive correlation results could be influenced by a higher proportion of SLPs who modify and personalize their clients' AAC systems than the full sample.

Only 13 participants reported to take CEU courses in autism often or very often, and 43% of participants are rarely/never completing CEU courses in autism. This is surprising, as over 50% of participants reported that their caseload is most/all or the majority children on the autism spectrum, and over 50% reported that their clients on the autism spectrum had minimal speech. This finding is concerning, as continuing education in the area of autism is crucial to best serve this population, especially considering such a high number of participating SLPs reported service a high proportion of children on the autism spectrum. Although reasoning for this low rate of completing autism-focused CEUs is unknown, it can be hypothesized that perhaps there are fewer accessible CEU courses in autism available to clinicians, or that clinicians may not be seeking out opportunities to further their education in topics surrounding autism. Given the growing prevalence of autism in the population, the proportion of participants' caseloads, and the lack of preservice education, either possibility is disconcerting. Participating clinicians also self-selected to complete a survey focused on autism intervention, suggesting this may even overinflate these numbers in comparison to the general population of SLPs who work with pediatric clients. It is to be noted that clinicians may be seeking out continuing education that are not necessarily considered CEU credits. For example, keeping up with recent academic journal publications, receiving mentorship from another clinician, or being an active participant within a special interest group within the American Speech, Language, and Hearing Association.

Almost all clinicians reported having a fair amount or a lot of experience working with children on the autism spectrum with minimal speech (95%) and most reported the same in AAC (78%). Considering that up to 30% of children on the autism spectrum use minimal speech, it can be presumed that SLPs with a lot of clinical experience with children on the autism spectrum would also consider themselves to have a lot of experience in AAC (Anderson et al., 2007). This high reporting of experience in both autism and AAC is promising. However, it is of note that these two variables were not significantly correlated in the exploratory post-hoc analyses, suggesting it is possible that, in fact, clinicians who report being the most experienced working with children on the autism spectrum with minimal speech might not be the most experienced in AAC.

Additionally, completing CEUs in autism generally was not correlated with increased use of evidence-based AAC provision practices (e.g., recommending AAC, including AAC early in intervention, and customizing AAC systems), nor was reported experience working with children on the autism spectrum generally. However, experience working with children with minimal speech specifically did show a positive relationship with these more supportive AAC practices. These results suggest that SLPs who have more experience working with children with minimal speech and/or providing AAC intervention are more likely to provide evidence-based AAC intervention, as well as SLPs who regularly complete AAC continuing education. However, general knowledge and experience with children on the autism spectrum more broadly may not be supportive enough for strong AAC intervention. Thus, clinicians who work with fewer children on the autism spectrum with minimal speech may be underprepared to provide the strongest evidence-based intervention for this population. Given that preservice education in autism is very limited, this is not surprising, but is disconcerting.

It is crucial that speech-language pathology preservice education programs are including ample coursework in the topics of both autism and AAC, especially if autism CEUs are less available, or potentially do not always represent evidence-based practice for providing AAC assessment and intervention for this population. This is critical for preservice SLPs and those who are currently practicing, to ensure that children on the autism spectrum with minimal speech are receiving appropriate services to best support their communication.

AAC Systems and Intervention

Deciding on a system type is an integral part of the process of recommending AAC supports for young children on the autism spectrum with minimal speech. Unaided supports, such as sign language or gestures, were reported to be used always or most of the time by the vast majority of clinicians surveyed (92%). These supports are easily accessible, as they inherently do not require external tools to produce – though sign language also requires education on the clinician's part, as well as familiar communication partners. However, unaided AAC alone can often only support more basic communication and likely will not meet all of a child’s unique communication needs adequately, especially when only including gestures (Beukelman & Light, 2020).

Low-tech AAC supports are those that involve minimal technology, such as a picture/choice board, visual schedule, or picture exchange to support communication. Low-tech supports are another more accessible option, as they can be created easily and can often be customized, and 40% of clinicians reported using these supports in intervention most of the time or always. However, like unaided supports, low-tech AAC does not include auditory output, which can be a critical feature in AAC systems to support both communication and engagement in the AAC system in young children on the autism spectrum with minimal speech (Couper et al., 2014; Millar et al., 2006; Van der Meer et al., 2012). Additionally adding vocabulary to low-tech AAC systems over time creates an increasingly more cumbersome AAC system to navigate, as the physical size of the system continues to increase.

Pre-programmed, high-tech AAC supports are usually an app on a tablet with a variety of generic and often abstract words already programmed into a grid display format within the device. However, this app software can also be highly customizable, with capabilities of changing symbol representation, personalizing the accessible vocabulary, and vocabulary organization. The majority of clinicians surveyed (75%) described that they recommend or include in intervention a pre-programmed, high-tech AAC system always/almost always or most of the time. However, only a third of participants indicated that they include or recommend customized high-tech AAC systems, and only 59% indicated that they make any modifications at all to a child's AAC system always or most of the time. This suggests that while clinicians are utilizing high-tech systems, many of them are incorporating them into therapy with little to no personalization. Interestingly, research suggests that a higher proportion of clinicians with specialization in AAC for young children who are early language learners report always or often modifying children's AAC systems (78%; Thistle & Wilkinson, 2015). This suggests that more targeted training and/or experience in AAC specifically may increase clinicians' knowledge and/or self-efficacy in providing more customized AAC systems.

Unfortunately, these types of pre-programmed grid-based AAC systems are challenging to navigate for both typically developing children and for school age/adolescent children who use AAC (Trudeau et al., 2014; Sutton et al., 2022). In addition, for young children who are developing language, the time-consuming nature of continually reprogramming this system design to best support an ever-growing vocabulary leads to devices that are infrequently personalized (Light et al., 2019). High-tech AAC systems for this population should support language learning by using motivating, familiar, and concrete vocabulary concepts.

It is unclear why a large proportion of the SLPs participating in this study are not including personalized or customized systems or even adding any modifications to their clients' AAC systems. This may be due to a lack of preservice training in AAC but may also reflect current trends in AAC intervention for young children on the autism spectrum specifically. Many clinicians and AAC device manufacturers endorse high-tech AAC systems that are specifically targeted at all young children on the autism spectrum with minimal speech, with an emphasis on retaining the abstract and generic vocabulary, line-drawn representations, and vocabulary organization that come default in the system. These perspectives focus on teaching all young children who use AAC the most frequently used words by typically developing toddlers, or core vocabulary, despite the fact that there is no strong evidence to support this approach (Frick Semmler et al., 2024; Laubscher & Light, 2020). This philosophy also views learning language using an AAC device as developing a motor plan to access vocabulary, instead of relying on conceptually understanding the symbol representation in AAC system, or the organization of vocabulary – a perspective that is misaligned with our knowledge of the language development of young children generally. If these trends are reflective of the results of this survey, this represents a highly concerning degree of misinformation that may be guiding AAC intervention for young children on the autism spectrum with minimal speech.

Evidence suggests that an aided AAC system representing meaningful vocabulary in contextualized, familiar scenes can better support communication development of early language learners on the autism spectrum (Holyfield et al., 2019; Light & Drager, 2007; Light et al., 2019). A visual scene display (VSD) is one example of a system that may better support a wider range of communicative functions in a manner that better reflects the language development of the focus population of young children on the autism spectrum with minimal speech (Chapin et al., 2021; Laubscher et al., 2022; Laubscher et al., 2019). VSDs allow for quick, easy programming of communication supports in the moment within familiar contexts (Holyfield et al., 2019; Light & Drager, 2007; Light et al., 2019). A salient feature of a VSD is the embedding of communicative "hotspots" within the display that, when selected, play speech output that relate to a contextualized, familiar image or video (Holyfield et al., 2019). SLPs have previously reported that they feel it is difficult to incorporate communicative functions other than requesting, leading to frustration from SLPs (Wendelken & Williams, 2023). However, a VSD naturally supports a larger number of communicative functions (e.g. comments, social interactions, greetings) within the same scene due to its highly customizable features and use of contextualized digital photographs. Unfortunately, only 16 SLPs reported to always/almost always incorporate customized, personalized high-tech systems of any kind. The reasoning why few SLPs are recommending this system type is unknown, however, it could be accounted for by a lack of preservice education discussing this system type, a lack of CEUs available in this topic, or that these findings could indicate a gap from current research to clinical practice.

Overall, participating SLPs indicated that they are frequently using a number of supportive AAC intervention strategies, such as modeling, prompting, educating the family, including the caregivers in modeling during sessions, and training caregivers to model supports in daily routines outside of the therapy room. Very few SLPs reported to rarely/never utilize any of the aforementioned strategies in AAC intervention with young children on the autism spectrum with minimal speech. Almost all SLPs (93%) reported to be always or almost always modeling AAC supports during intervention sessions. Modeling can augment spoken input to the early language learner and also supports symbolic language development by increasing vocabulary knowledge, building early semantic relations, and demonstrating more complex linguistic structures (e.g. morphology, syntax, and phonological representations; Romski & Sevcik, 1996; Beukelman & Mirena 1998; Romski & Sevcik 2004). Participating clinicians were slightly less likely to prompt children on the autism spectrum during intervention – though 66% still used prompting always or most of the time. Although there is less evidence addressing the role of prompting in AAC intervention, some research suggests that it may be even more supportive of language and communication development for children using aided AAC than modeling alone (Romski et al., 2010). Taken together, these results indicate that SLPs are generally using strong evidence-based practices in their intervention with young children on the autism spectrum with minimal speech.

Access to AAC

Most clinicians surveyed stated that they are introducing AAC supports of some kind in the initial session or within the first few sessions (74%). These practices align with the research evidence regarding access to AAC. It is crucial that young children on the autism spectrum with minimal speech are receiving early access to AAC supports, as there is strong evidence reporting that earlier access to aided AAC systems leads to greater gains in social communication and language outcomes, as compared to even slightly delayed access (e.g., six months later; Kasari et al., 2014). Early access to supports is associated with a global increase of speech and language, such as increases in communicative turns, spontaneous initiations, vocalizations, social interactions, and turn-taking requests. Access to AAC supports can also decrease challenging behaviors (Chapin et al., 2021; Charlop-Christy et al., 2002; Drager et al., 2006; Schepis et al. 1998, Kravis et al., 2002). It is heartening that most clinicians working with this population are following these practices.

However, this means that over a quarter of clinicians reported that they only begin using AAC supports with young children on the autism spectrum with minimal speech in therapy sessions after working on speech alone, delaying access to functional communication and potentially decreasing overall long-term language outcomes. Importantly, use of AAC supports has been shown to increase speech and verbalizations over time, as well (Millar et al., 2006). Unmet communication needs in this population impedes language acquisition and causes frustration for both the communicator and their communication partner. (Kasari et al., 2014, Boyd et al., 2010).

Only 19% of SLPs surveyed reported that all or almost all of the young children on the autism spectrum with minimal speech had access to their own personal high-tech AAC devices. Sixty-three percent of participants stated that half or less of the children on their caseload with minimal speech had access to their own personal AAC system. Personal AAC systems allow for more complete customization to the child to meet their communication needs, as well as allowing for access outside of the therapy room in all contexts of the child's life. Targeting vocabulary concepts that are personalized to the child's needs are more reflective of evidence in early language development, and access to a personal AAC system allows for more of these types of targets in intervention (Binger et al., 2024; Frick Semmler et al, 2024; Laubscher et al., 2020).

Interestingly, correlation analyses suggested that SLPs who more often customized and modified their clients' AAC systems reported that their clients were less likely to have access to personal AAC supports in their daily life. Thus, those children who do have access to their own personal AAC system may be more likely to have systems that do not reflect their daily lives. Access to effective communication, whether it be via speech or via AAC supports, is a right for all in every environment, not just within the therapy room. It is critical that AAC systems are always accessible to the individual to meet their unique communication needs. Giving a child access to supports outside the therapy room will not only allow the individual their right to communicate their wants and needs but will also give the child the opportunity to use their supports in more naturalistic contexts that cannot be fully replicated within a therapy environment.

Of the children who do have access to a personal device, the majority of participating SLPs reported that these devices were funded by insurance, followed by the school system. However, 20% of SLPs reported that the family of the child usually funds the AAC device. Given that AAC supports are generally covered by insurance or should be covered by the school system for children in school, this is a disconcerting finding. Just an AAC application can cost over $300, and an iPad is needed in addition, and dedicated AAC systems can cost thousands. The reasoning is unknown but could indicate institutional barriers in allowing young children on the autism spectrum with minimal speech appropriate access to AAC supports. This finding may also explain why many children are not reported to have access to their own personal AAC system.

Family-Centered Practice

A positive, relational, and participatory relationship between clinician and caregiver is correlated with positive outcomes for both the family as well as the individual in early intervention practices (Dunst et al., 2007). When considering these factors from the perspective of AAC assessment and intervention, this partnership built with caregivers of young children on the autism spectrum with minimal speech can give insight into the child's individual communication needs to better shape how intervention can meet those needs (Mandak & Light, 2024). Clinicians reported frequently engaging in a variety of family-centered practices in their AAC assessment and intervention sessions. Over three quarters of SLPs stated that they included the family in selecting the type of AAC supports for their child always or most of the time, and most participating SLPs also reported including the family in goal setting always or most of the time (81%). Almost all clinicians (89%) indicated that they include the family in selecting vocabulary to program into their child's AAC system. This is reflective of the research, as evidence suggests that the priorities, preferences, and quality of life of children who use AAC are better determined by the AAC user and their family and not by the professional (Lund & Light, 2006).

Caregivers are crucial to the process of selecting personally relevant vocabulary, as they can better determine the priorities and preferences of the child. A lack of access to vocabulary that is personally relevant to the child can limit access to language, as early language learners are developing language skills over time, and may cause missed communication opportunities in a variety of contexts (Light et al., 2019). The high frequency with which SLPs are reporting including caregivers in vocabulary selection is very promising. However, it is important to note that only a third of participants stated that they always or mostly use personalized high-tech AAC systems when working with this population. Thus, while clinicians may be including additional relevant vocabulary within a child's system – and collaborating with the family to do so – much of the overall vocabulary may still be the generic and abstract vocabulary pre-programmed into the device.

Fewer SLPs reported including the family always or most of the time in processes such as selecting symbol representations (60%), deciding how to organize vocabulary within the AAC system (44%), and choosing therapy activities (67%). Each of these processes is critical in creating an AAC system and intervention setting that reflects the unique communication needs and family environments for children on the autism spectrum with minimal speech. For example, evidence suggests that symbols that are more iconic (e.g., color photos) lead to better language outcomes and are easier for early language learners utilizing AAC supports to learn than less iconic symbols, such as cartoons or more abstract figures (Schlosser & Sigafoos, 2002). Selecting iconic symbols that are meaningful to the individual requires input from the caregivers who are involved in everyday routines with the child. Allowing the caregiver to participate in choosing therapy activities gives them an opportunity to express their child's unique communication needs across contexts. Including the family in identifying therapy activities can also better ensure that the AAC system is functional based on the child's most frequent communication partners, routines, wants, and needs (Mandak & Light, 2018).

Clinical Implications

The results of this study indicate that many SLPs who work with young children on the autism spectrum with minimal speech are frequently engaging in a number evidence-based practices. However, this study also identified several areas in which SLPs could benefit from more support. There appears to be a need for more comprehensive preservice education in the areas of both autism and in AAC. The amount of coursework appears to have increased over time, but results revealed that more comprehensive coursework in both areas is crucial in developing competent clinicians. Although autism is only one diagnosis that an SLP may treat, it is estimated that prevalence of autism has increased to 1 in 36 children (Maenner et al., 2023), so it is increasingly important that training in speech-language pathology include coursework to prepare SLPs to best serve individuals on the autism spectrum. Utilizing AAC supports is crucial for all people whose speech does not meet their communication needs, not just those who may be on the autism spectrum. In order to best serve all populations, future clinicians should be receiving adequate amounts of education in the process of assessment and intervention in AAC. In terms of continuing education, more CEU courses in autism should be accessible to clinicians. Although the reasoning for a lack of clinicians completing CEUs in autism is unknown, it may be due to a small number of available courses, or that courses available are not beneficial to clinicians who currently serve children on the autism spectrum.

It was also identified that while almost all clinicians are using unaided AAC supports with young children on the autism spectrum with minimal speech (e.g., manual signs), far fewer SLPs are frequently incorporating aided AAC supports into intervention (e.g., low-tech topic boards, high-tech AAC systems). Strong evidence suggests that unaided AAC supports are more challenging for young children on the autism spectrum to learn and use, and also less appealing to these children (Couper et al., 2014; van der Meer et al., 2012). It is critical that clinical education for SLPs emphasize familiarity with and implementation of aided AAC supports for this population. Although high-tech systems may not always be accessible to SLPs and families, low-tech AAC supports (e.g., laminated paper topic boards) are likely to be more supportive than unaided AAC and are more easily accessible than high-tech systems.

Additionally, few clinicians are using customized high-tech AAC systems for this population of young children (aged 1-5) on the autism spectrum with minimal speech, and many are using pre-programmed devices without modification. Current research supports the use of highly customizable AAC systems for early language learners, such as the use of visual scene displays or personalized topic displays. Research shows that pre-programmed high-tech devices are challenging to navigate and use for both typically developing children and for school age/adolescent children who use AAC (Trudeau et al., 2014; Sutton et al., 2022), so it can be inferred that these display types would be challenging to navigate for young children on the autism spectrum who are early language learners. It may be that inadequate coursework in AAC could lead to a lack of knowledge and self-efficacy for clinicians in customizing and personalizing AAC systems, or knowledge of AAC systems targeted at early language learners like VSDs.

However, these low levels of customization and personalization may also reflect current trends in AAC intervention for young children on the autism spectrum specifically that do not reflect the research evidence or the process of language development. If clinicians are indeed focusing on a core vocabulary and motor planning approach to AAC intervention – in which generic vocabulary, abstract symbol representations, and vocabulary organization are intentionally preserved in the pre-programmed AAC system – this is an indication of a glaring gap in preservice training and CEUs in autism and AAC. It is critical that coursework and CEUs in AAC and autism reflect evidence-based practice in AAC system customization, not simply instructing SLPs how to use pre-programmed systems without modification, or trends in clinical practice that are unsupported by the research and are theoretically dubious.

SLPs are consistently including the family in several areas of the assessment and intervention process when utilizing AAC supports such as in choosing the system type, vocabulary selection, and in goal setting, but few are including the family when choosing symbol representations, vocabulary organization, and when choosing therapy activities. Caregivers should be an equal member of the assessment and intervention team when considering AAC supports for their child. Caregivers know their child best, so it is crucial to include them during this step of the assessment process. It is crucial that AAC preservice training specifically highlight the importance of family-centered practice in AAC assessment and intervention. It may also be that SLPs are not generally customizing symbol representations and vocabulary organization for the child in any way, and are thus not including caregivers, if these modifications are not a part of the assessment and intervention process. Previous research suggests that clinicians who specialize in AAC intervention specifically consider symbol representation to be very important (Thistle & Wilkinson, 2015). This again suggests that preservice education and CEUs may not be supporting these evidence-based practices sufficiently for the general population of SLPs.

Limitations

The current study addressed a critical area of clinical practice in speech-language pathology, exploring current practices of SLPs working with young children on the autism spectrum with minimal speech. This client population is increasingly expanding, with many pediatric SLPs having a high proportion of these children on their caseload. Despite this, minimal research has explored actual clinical practice trends in this area. This study provides a critical first step in identifying gaps in evidence-based practice for SLPs working with children on the autism spectrum with minimal speech.

This study does have several limitations. A smaller sample size and a lack in diversity of participants' gender and race/ethnicity was a significant limiting factor. Most participants were white and female, limiting diversity within the sample. Although this overrepresentation of white females does reflect the field of speech-language pathology generally, it still highlights a homogenous perspective. Surprisingly, 30% of participants reported over 20 years of clinical experience. This may suggest that the results of the current study reflect the education, practices, and experience of SLPs who completed their preservice training at an early point in the field. It is possible that if survey respondents were more evenly spread, or skewed towards more recent graduates, the patterns found in the data may look different.

Another limitation of this study is the inherent subjectivity of survey questions, as questions had the potential of being understood differently than their intended purpose depending on the reader's interpretation. The survey was constructed to be as objective as possible and reviewed by two expert clinicians. However, this does not remove the possibility that SLPs interpreted survey questions in a way that was not intended, with potential different interpretations across participants. For exampling SLPs might have misinterpreted some questions as relating to all children on their caseload on the autism spectrum, as opposed to only children with minimal speech. Perceptions of what customized AAC systems refer to or what sort of changes to a pre-programmed high-tech AAC system reflect "modifications" was also open to greater interpretation and may have influenced results. It is also to be noted as a limitation that the survey did not include a question addressing alternative means to continue education when asking about a clinician’s experience, such as receiving mentorship, reading journal articles or participating in an ASHA special interest group.

Recruitment of SLPs was conducted via email, ASHA Special Interest Groups, and Facebook group to reach a broad group across the United States, and the sample included a wide variety in years of experience. However, the sample obtained may not represent the decision-making of all SLPs regarding AAC assessment and intervention with young children on the autism spectrum – only those that are active in these online forums and are predisposed to participate in surveys. One strength is that the recruitment materials did not refer to AAC or children with minimal speech, potentially including a broader group of clinicians who work with children on the autism spectrum generally. However, recruitment information did refer to young children on the autism spectrum, so it is possible that individuals who opted to take the survey have a special clinical interest in children on the autism spectrum, which may or may not be indicative of clinical practices of all SLPs in the United States who may work with this population.

Conclusion

The purpose of this study was to explore the decision-making process related to provision of AAC supports by SLPs serving early intervention and preschool-age children on the autism spectrum with minimal speech. It was found that the vast majority of clinicians surveyed are incorporating AAC supports of some kind within their intervention for this population. However, unaided AAC supports are the most prevalent, with far fewer SLPs frequently including aided AAC supports, and fewer still customized or modified high-tech AAC systems. Current literature suggests that highly customizable high-tech display types may be more appropriate for early language learners to support their language learning over time, target multiple communicative functions, and to best adapt to each child's unique communication needs. Clinicians who are completing AAC CEUs as well as those who self-reported AAC intervention experience were both correlated with provision of more supportive and evidence-based practice for young children on the autism spectrum with minimal speech, by recommending AAC, recommending it early in the intervention process, and customizing children's systems. This suggests that both clinical experience in AAC and active participation in maintaining current knowledge in AAC are supportive of evidence-based practice. Unfortunately, few clinicians reported to have full-term coursework in their preservice education program in both autism and in AAC, which is crucial in developing clinicians who are prepared to support children on the autism spectrum with minimal speech. This study also found that many SLPs are incorporating families in the decision making related to AAC system type, vocabulary selection, and goal setting, but fewer are including families in the areas of symbol representation choices, vocabulary organization, or in choosing therapy activities. Caregivers know the child and their unique communication needs best, so it is critical that SLPs are including the caregiver in every aspect of assessment and intervention.

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Appendix A

Survey Questions

Demographic Information

1. Where do you practice? (zip code)
2. How long have you been practicing? (0-2 years, 3-5 years, 6-8 years, 9 years or more)
3. How many years of experience do you have working with young children on the autism spectrum with minimal speech? (0-2 years, 3-5 years, 6-8 years, 9 years or more)
4. Did you complete graduate coursework specifically in AAC? (full class, short-term class, unit in another course, little to none)
5. Did you complete graduate coursework specifically in autism? (full class, short-term class, unit in another course, little to none)
6. Have you completed any CEUs specifically related to AAC? (all, most, some, few/occasionally, none)
7. Have you completed any CEUs specifically related to autism? (all, most, some, few/occasionally, none)
8. Which of the following best describes you? Select all that apply.
    a. American Indian or Alaska Native
    b. Asian
    c. Black or African American
    d. Hispanic, Latino, or Spanish Origin
    e. Middle Eastern or North African
    f. Native Hawaiian or Pacific Islander
    g. White
    h. Multiethnic

    i. Other

9. How old are you? (enter numerical age)

Setting/Caseload

1. Approximately what percentage of your caseload are considered young children on the autism spectrum? (0-20%, 21-40%, 41-60%, 61-80%, 80-100%)
2. Approximately how many of the young children on the autism spectrum on your caseload have minimal speech/are nonverbal? (0-20%, 21-40%, 41-60%, 61-80%, 80-100%)

The questions for the remainder of the survey are only related to the young children on your caseload on the autism spectrum with minimal speech

1. For each of the below listen AAC supports, indicate how often you incorporate each into sessions with young children on the autism spectrum with minimal speech (Likert scale from rarely/never to almost always/always for the following options):
    a. Unaided AAC (e.g. modeling signs and symbolic gestures)
    b. Low tech supports (e.g. PECs/topic board)
    c. Mid-tech supports with prerecorded messages (GoTalk, BigMac button, Step by Step)
    d. Pre-programmed, high tech, robust AAC system (e.g. app on an iPad (LAMP) TDsnap, Proloquotogo)
    e. Customized/personalized high tech AAC system (e.g. visual scene display, activity-based topic displays, etc.) + other open response
2. Indicate how often you incorporate the following types of strategies related to aided AAC supports (Likert scale from rarely/never to almost always/always for the following options):

    a. Model use of AAC supports
    b. Prompt child to use AAC supports
    c. Educating caregiver about their child’s AAC supports
    d. Actively include the caregiver in modeling the AAC supports during therapy sessions
    e. Train caregiver how to model AAC in daily routines outside of the therapy session
3. Approximately how many of the children on your caseload on the autism spectrum have access to their own personal aided AAC system? (0-20%, 21-40%, 41-60%, 61-80%, 80-100%)
4. What setting or site do you typically work with young children on the autism spectrum? (outpatient/private practice, school, in-home services + other open response)

<u>Current practices of EI SLPs for children on the autism spectrum with minimal speech in assessing and implementing intervention AAC</u>

1. How often do you recommend AAC for young children on the autism spectrum with minimal speech? (all the time, most of the time, some of the time, rarely/never.)
2. For the individuals you are recommending AAC for, what criteria influence your decision-making for this population? (open response)
3. When you are recommending AAC, please describe how you decide what system to recommend. (open response)
4. How often do you make modifications to a child on the autism spectrum’s AAC system (all the time, most of the time, some of the time, rarely or never)

5. Describe typical modifications you make to the AAC systems of children on the autism spectrum (open response)
6. What do you typically initially target in AAC intervention? (open response)
7. Please describe how you decide what types of goals to target in AAC intervention (open response)
8. Indicate how often you include the individual’s family in the following elements of AAC assessment and intervention (Likert scale from rarely/never to almost always/always for the following options):
    a. Selecting the type of AAC system/supports
    b. Selecting vocabulary to target, selecting symbol representation
    c. Determining how to organize vocabulary on AAC system
    d. Selecting goals to target
    e. Selecting activities to target goals in intervention
9. What are some typical barriers you encounter in AAC assessment and intervention? (open response)
10. What are some typical facilitators you encounter in AAC assessment and intervention (open response)
11. If you recommend AAC, how is it funded? (full coverage by insurance, partial coverage by insurance partial coverage by individual, full coverage by individual, grants or other financial support, other open response)

Appendix B

Participants By State

State	Number of Participants
Alabama	10
Alaska	1
Arizona	2
California	7
Connecticut	1
Florida	4
Georgia	6
Hawaii	1
Illinois	4
Indiana	1
Iowa	1
Kansas	1
Kentucky	1
Maryland	2
Missouri	1
New Hampshire	1
New Jersey	4
New York	3
North Carolina	3
Ohio	1
Oklahoma	1
Oregon	2
Pennsylvania	6
South Carolina	3
Tennessee	1
Texas	4
Virginia	1
Washington	1
Washington, D.C.	1
Wyoming	1
Total	76

Appendix C

Participant Demographics

Demographic Category	Number (76)	Demographic Category	Number (76)
Race/Ethnicity[1]		Years of Experience with Young Children on the Autism Spectrum	
Black or African American	7	0-2	9
White	68	3-5	12
Hispanic/Latino	6	6-10	20
Asian	2	11-15	9
American Indian	1	16-20	6
Multiethnic	1	21+	21
Gender		Credentials[1]	
Female	74	CCC-SLP	72
Male	1	CF-SLP	5
Prefer not to say	1	SLPA	1
Age		State Licensure	56
25 or younger	6	Other	4
26-35	22	Clinical Setting[1]	
36-45	22	School	38
46-55	16	Private Practice	20
56-65	8	In-Home Services	27
66+	3	Telepractice	5
Years Practicing		Outpatient	16
0-2	9	Other	10
3-5	12	Service Delivery Model	
6-10	15	All-In Person	63
11-15	11	Most In-Person, Some Telepractice	11
16-20	7	Equal Amount Telepractice and In-Person	2
21+	23	Most Telepractice, Some In-Person	0
		All Telepractice	0

[1] Participants could select more than one option