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Views of Speech-Language Pathologists on Telepractice for Children who use Augmentative and Alternative Communication

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Abstract:	Telepractice has become increasingly utilized, particularly with recent and ongoing measures to slow the spread of the novel coronavirus (COVID-19). In this study, 361 speech-language pathologists (SLPs) responded to a national, web-based survey about views on utilizing telepractice with children aged 3 to 21 who used aided augmentative and alternative communication (AAC), such as picture symbols or speech-generating devices. The views of SLPs varied, and SLPs who received training on AAC telepractice within the last 12 months had more positive views. Factors associated with when and how SLPs thought telepractice was beneficial to serve children who use aided AAC included their foundational perspectives about telepractice, service delivery options, considerations related to the child and family, and broader resources and constraints.

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Abstract

Telepractice has become increasingly utilized in disability services, particularly with recent and ongoing measures to slow the spread of the novel coronavirus (COVID-19). In this study, 361 speech-language pathologists (SLPs) responded to a national, web-based survey about their views on utilizing telepractice with children aged 3 to 21 who used aided augmentative and alternative communication (AAC), such as picture symbols or speech-generating devices. The views of SLPs varied, and SLPs who received training on AAC telepractice within the last 12 months had more positive views about telepractice than those who did not. Several factors were associated with when and how SLPs thought telepractice was beneficial to serve children who use aided AAC, including SLPs' foundational perspectives about telepractice, service delivery options, considerations related to the child and family, and broader resources and constraints.

Keywords: telepractice, complex communication needs, services, AAC, COVID-19

Views of Speech-Language Pathologists on Telepractice for Children and Adolescents who use Augmentative and Alternative Communication

Telepractice has been receiving increasing attention as a service delivery option for individuals with intellectual and developmental disabilities (IDD). For some time, professional organizations have recognized the viability and potential benefits of telepractice as a strategic service delivery option, including, for example, in speech-language pathology (American Speech-Language-Hearing Association [ASHA], 2004), physical therapy (American Physical Therapy Association, 2019), and occupational therapy (American Occupational Therapy Association, 2021). Across disciplines serving individuals with IDD, telepractice has been suggested to have many benefits. For example, telepractice can aid in the provision of high-quality services in remote or underserved locations by alleviating service provider shortages and minimizing challenges associated with travelling to receive services (Anderson et al., 2012; Casale et al., 2017; Cason et al., 2018). Recently telepractice has become a major focus for service provision because of the COVID-19 pandemic (Centers for Disease Control and Prevention, 2020). Service providers have turned to telepractice in a more widespread way than ever before as schools, clinics, and other facilities have taken action to slow the spread of the novel coronavirus (ASHA, 2020a; U.S. Department of Education, 2020). Despite the increase in the use of telepractice to serve individuals with IDD, empirical knowledge is still emerging, and there is a critical need for continued research in this area. Even further, many service providers, individuals with IDD, and their family members have been experiencing telepractice for the first time during the COVID-19 pandemic. Therefore, increased familiarity and experience with telepractice makes the pandemic an ideal time to investigate the nature of service providers' perceptions related to this service delivery option.

Telepractice for Children and Adolescents with Developmental Disabilities

The nature of telepractice services for children and adolescents with IDD can vary quite widely. First, although many practitioners liken telepractice with the use of live videoconferencing technology, telepractice can actually include both asynchronous methods (e.g., online modules, emails, text messages) and synchronous methods (e.g., videoconferencing, phone calls; Casale et al., 2017). Camden et al. (2020) conducted a systematic review of the characteristics and effectiveness of telepractice-based interventions across rehabilitation professions (e.g., occupational therapy, speech-language pathology). The findings of the review suggested that telepractice-based interventions varied in characteristics (e.g., technology used, type of intervention, interactions with the therapist) but were generally effective for improving aspects of functioning for children and adolescents with developmental disabilities. Further, Camden et al. (2020) found that the use of videoconferencing technology was not a primary factor in efficacy. Because the type of technology used did not appear to influence outcomes, the authors suggested that service providers should adopt multimodal approaches to using technologies for telepractice, and that providers should individualize their approaches to fit the needs and preferences of specific children and their families. Second, the nature of telepractice services also varies because services can be focused on providing direct services or on supporting children more indirectly through consultation, coaching, and collaboration with family members and/or other providers (Casale et al., 2017). Some research suggests that telepractice interventions may be especially promising to improve outcomes for children and adolescents with disabilities if the services focus on high-quality coaching of natural stakeholders such as parents (Akemoglu et al., 2020; Camden et al., 2020).

Although telepractice is still an emerging area of research, it is important to recognize

that services delivered through telepractice have been shown to support skill acquisition for children and adolescents with IDD, as well as their caregivers and practitioners (Akemoglu et al., 2020; Camden et al., 2020). Numerous benefits or potential benefits to telepractice have been noted, which include reduced wait time for services, alleviated scheduling challenges, reduced travel time for families and providers, increased access to resources and evidence-based interventions in underserved areas, and improvements in children's skills within natural environments (Anderson et al., 2015; Casale et al., 2017). Additionally, although there are upfront technology expenses, telepractice has been noted to be a cost-effective option (Casale et al., 2017). Given these advancements, telepractice is now covered in many states within the United States as a billable therapy service for children with disabilities (ASHA, 2020b; Oberleitner et al., 2005).

However, many challenges to telepractice also exist. First, there are numerous technologies that may be needed to effectively carry out telepractice. These can include access to a computer, smartphone, or tablet; video conferencing equipment; internet service or cellular data packages; and secure platforms that comply with the Health Insurance Portability and Accountability Act (HIPAA, 1996) and/or the Family Educational Rights and Privacy Act (FERPA, 1974; ASHA, 2020a). As such, technology issues are a common complaint of providers implementing telepractice, and inequitable access to equipment, devices, and internet can create barriers for effective use (Iacono et al., 2016; Tucker, 2012b). Second, insufficient training poses challenges. Several studies document the limited training and experiences that SLPs typically have with telepractice (Grogan-Johnson et al., 2015; Tucker 2012a; 2012b), which is problematic because service providers who have limited experiences with or training in telepractice may not have a clear vision for how it can be used effectively. When examining the

views of parents and practitioners of young children with autism, Iacono et al. (2016) found that practitioners' limited training and experience with telepractice led to reluctance about its use and beliefs that parents would not be open to or interested in services delivered remotely. Similarly, Dunkley and colleagues (2010) found that the nature of SLPs' acceptance of and confidence in information and communication technologies (e.g., videoconferencing, email) acted as either a barrier or facilitator to the effective use of these technologies when providing services to individuals with disabilities in rural areas. Third, challenges may arise when using telepractice to provide direct services to children with IDD. Children with IDD may not be able to independently operate technology for telepractice or may struggle to remain engaged and in front of the video camera during sessions. These challenges may make it important to have a facilitator (often a caregiver in the home) to help support the child during telepractice sessions and/or to shift service delivery to focus more on coaching and consultation (Snodgrass et al., 2017).

Augmentative and Alternative Communication (AAC)

Many children with IDD do not use verbal speech to meet their daily communication needs and benefit from augmentative and alternative communication (AAC), including aided AAC systems which involve external tools such as (e.g., picture symbols, dedicated speech-generating devices [SGDs], or mobile communication applications; Beukelman & Light, 2020). As with other therapeutic services, AAC-related communication services can be provided via telepractice. Further, telepractice can be a cost-effective solution to address current AAC provider shortages in many areas (Anderson et al., 2012; Hall et al., 2014), and research suggests it may be especially useful for family coaching and supporting AAC implementation in natural home settings (Douglas et al., 2021).

However, many of the challenges with telepractice are amplified for service providers

working with children who use aided AAC. Given that many children who use aided AAC have complex support needs (e.g., communication, behavioral), service providers may find it especially difficult to provide direct telepractice services without a skilled adult present with the child (Snodgrass et al., 2017). Therefore, SLPs or other practitioners may be likely to view AAC telepractice if it is used for coaching and consultation, rather than for providing direct services to children themselves. As an additional consideration that can make things challenging, practitioners who provide AAC telepractice need to be knowledgeable in both telepractice and AAC (Anderson et al., 2012). However, prior research has documented that many SLPs receive limited training in both of these areas (Johnson & Prebor, 2019; Tucker, 2010b).

Given the importance of the views of service providers about telepractice for its effective use in practice (Dunkley et al., 2010; Iacono et al., 2016; Tucker, 2012a; 2012b), research is needed to better understand practitioners' views, including to investigate what factors might be associated with how positively practitioners view the use of telepractice. Conducting such research during the pandemic could be especially advantageous because many providers have needed to begin using telepractice and provider perspectives may be influencing the quality of services that children and youth are receiving during this crisis. However, the importance of understanding providers' views on AAC telepractice extends beyond the context of the pandemic. Telepractice will remain an important service delivery option in a post-pandemic future to address limited access to AAC services for those who live in underserved areas, who are unable to travel for services, and whose medical needs do not allow them to attend face-to-face therapy. Further, the use of telepractice may also offer other benefits, such as improving connections between school and home and the consistency of AAC service provision and supports across environments (Biggs, Therrien, et al., 2021; Douglas et al., 2021).

Purpose of the Present Study

This study was part of a larger survey project which examined several different issues associated with the use of telepractice with children and youth who used aided AAC during the COVID-19 pandemic. Other manuscripts from the project examined how SLPs utilized AAC telepractice and the challenges and facilitators they experienced (Biggs, Therrien, et al., 2021); SLPs' preparedness, training, and support for using telepractice to serve children learning to use aided AAC (Biggs, Rossi, et al., in press). The present manuscript focused on three unique research questions about the views of SLPs that were not addressed in previous manuscripts: (1) What are the views of SLPs regarding the utility of telepractice for children who use aided AAC? (2) Are views about the utility of AAC telepractice associated with the age of the SLP, and are there differences in the views of SLPs based on their newness to working with children who use AAC, prior experience with telepractice, or receipt of training or personal support on telepractice in the last year? (3) What are the views of SLPs regarding when and how to use telepractice to serve children who use aided AAC?

We approached the first research question as being descriptive and exploratory and did not make specific hypotheses. Related to the second research question, we hypothesized: (a) that the age of SLPs would be negatively associated with positive views about AAC telepractice; (b) that SLPs who were newer to working with children who use aided AAC would have less positive views about AAC telepractice than SLPs with more than three years of AAC experience; (c) that SLPs with prior telepractice experience would have more positive views than those using telepractice for the first time during the COVID-19 pandemic; and (d) that SLPs who received training or personal support related to telepractice in the last year would have more positive views than SLPs who had not received training or personal support. We planned to address the

third research question by integrating analysis of qualitative and quantitative data from survey responses, focusing on the conditions under which SLPs found telepractice more or less appropriate or beneficial for children who used aided AAC. Quantitatively, we hypothesized that SLPs would view telepractice more positively for consultation/coaching services as compared to direct services, and that they would view the use of telepractice more positively within the context of the COVID-19 pandemic as compared to outside this context. Qualitatively, we sought to explore this question through analysis of open-ended survey responses.

Method

Recruitment and Inclusion Criteria

To be included, participants needed to be an SLP in the United States who had at least one child on their caseload aged 3-21 who used any form of aided AAC (e.g., picture symbols, communication boards or books, SGDs). Participants were recruited in multiple ways to obtain a sample of SLPs across the United States that represented the diversity of the target population with regard to practice characteristics (e.g., caseload, work setting). Our research team had many different organizations and individuals who worked with SLPs send emails or post electronic recruitment flyers about the study, including state ASHA associations (n = 19), state departments of education (n = 8), University Centers for Excellence in Developmental Disabilities (n = 4), an AAC device company representative (n = 1), and a state-wide grassroots AAC organization (n = 1). In addition, our research team distributed electronic recruitment flyers and descriptions about the study through Twitter, Facebook groups (n = 13 different groups) related to telepractice or speech-language pathology, and online discussion boards relevant to SLPs (n = 3 different locations). To thank participants for survey completion, five randomly selected participants received a $75 e-gift card after the study.

Participants

A total of 394 potential participants met inclusion criteria and started the survey; however, 33 potential participants were excluded because they exited the survey before completing any survey items addressing the research questions for the present analysis. Thus, a total of 361 participants were included. On average, the 361 participants were 40.6 years of age (*SD* = 11.1, ranging from 24 to 73 years). The majority of participants (*n* = 247, 68.4%) were school-based SLPs. In addition, 56 participants (15.5%) worked exclusively outside of school settings (e.g., clinics, private practice), and 58 participants (16.1%) worked in both school-based and non-school-based settings. The majority of participants (*n* = 291, 80.6%) reported they had begun using telepractice in response to the COVID-19 crisis. The other participants reported they either had never used telepractice to provide services to students aged 3-21 (*n* = 36, 10.0%), were already using telepractice with students aged 3-21 prior to the COVID-19 crisis (*n* = 27, 7.5%), or had previously but were no longer using telepractice to serve students aged 3-21 (*n* = 7; 1.9%).

SLPs worked with students across grade levels from preschool to community-based transition programs (3-21 years), and who ranged from being pre-intentional communicators (i.e., demonstrating observable behaviors that can be interpreted to determine what the child may want or need) to skilled AAC users who could generatively combine words to communicate more complex ideas. Related to special education disability categories of their students who used aided AAC, SLPs most frequently reported working with students with autism (84.2% of SLPs), multiple disabilities (58.2%), intellectual disability (57.1%), and developmental delay (54.3%), but many SLPs also worked with other students using AAC who were served under different special education eligibility labels (see Table 1 for additional information about the

characteristics of participants and the students they served). SLPs resided in 45 of the 50 states, excluding Alaska, Mississippi, Montana, Nevada, and Vermont.

Procedures

Survey data were collected for six weeks, from May 1 to June 13, 2020. The survey was developed and revised using the principles of 'tailored design' for survey research (Dillman et al., 2014), which included reviewing literature related to the use of telepractice to provide communication services (e.g., Anderson et al., 2012; Tucker 2012a; 2012b), addressing the identified research questions, and considering the best ways to gather information from the target population. Prior to data collection, the research team piloted the survey by having five practicing SLPs and two students complete the survey and provide feedback. Minor edits were made to the wording of questions based on their feedback. The survey was put onto a secure online survey platform, REDCap (Harris et al., 2009) after receiving approval from the Institutional Review Board. The survey could only be completed electronically and took approximately 20-30 minutes to complete. Recruitment flyers and descriptions directed potential participants to a survey website through a weblink or QR code. On the website, potential participants first saw a description of the study and then completed three screening questions to determine eligibility before beginning the survey.

Measure

The full survey for the larger project (available from the first author by request) was comprised of 218 items, both closed- and open-ended. Using branching logic, participants were asked different questions based on their responses to earlier items in the survey. The 218 items were broken into nine sections: (a) SLP characteristics and characteristics of their caseload; (b) general experience with telepractice; (c) use of AAC telepractice prior to the COVID-19 crisis;

(d) current use of AAC telepractice; (e) using telepractice to provide consultation/coaching services; (f) using telepractice to provide direct services; (g) training and support to use telepractice; (h) facilitators, barriers, and advice about AAC telepractice; and (i) views about AAC telepractice. The present analyses involved variables derived from survey items in only three categories: SLP characteristics and characteristics of their caseload, SLP views about AAC telepractice, and training and support on telepractice.

SLP Characteristics and Characteristics of Their Caseload

SLP respondents reported their role (e.g., school-based, not school-based) and information about demographic and professional characteristics (i.e., gender, race/ethnicity, age, state, years of experience as an SLP, caseload size, use of AAC telepractice). We asked SLPs to describe the community within which they provided services as being rural, suburban, small urban (population 50,000-250,000), and/or large urban (population > 250,000), and SLPs could select more than one. SLPs also reported the following about their students who used aided AAC: age ranges of students, IDEA disability categories (primary and secondary), expressive communication level (i.e., pre-intentional; intentional, pre-linguistic; emerging symbolic; early linguistic; proficient AAC), and type of aided AAC (i.e., low-tech, high-tech). SLPs also reported their years of experience working with students who use AAC. To test our hypothesis that SLPs who were new to working with AAC would have different views about AAC telepractice than SLPs with more AAC experience, we created a *new to AAC* variable, defined as SLPs who reported working with students who used AAC for three years or fewer.

Views about AAC Telepractice

Ten questions were items about SLPs' views about the use of telepractice with students who use aided AAC. The items were created for this study based on similar items used in other

studies and on broader AAC telepractice literature (Anderson et al., 2012; Tucker, 2012a; 2012b). The first eight items addressed SLPs' views about the appropriateness or usefulness of telepractice to provide services to students aged 3-21 who used aided AAC. The other two items addressed views about: (a) whether SLPs need specialized training to deliver telepractice services to children who use aided AAC and (b) their confidence in their overall abilities to use telepractice to provide effective services to children who use aided AAC. Responses were provided on a 5-point Likert-type scale ranging from 1 = *strongly disagree* to 5 = *strongly agree.* As our primary dependent variable of interest, we created a composite *Views of AAC Telepractice* score using the mean of the first eight items (i.e., items 1-8 in Figure 1). Possible values ranged from 1-5, with higher values indicting more positive views about the use of AAC telepractice with children who use aided AAC. Cronbach's alpha for these items in the sample was .91, indicating strong internal consistency.

Training and Support Related to Telepractice

SLP respondents provided information about any (a) training or (b) personal support (e.g., personal advice, help) they had received related to using telepractice with children who use aided AAC. Six items addressed different types of training: formal university coursework, group training or professional development, on the job training, an in-person conference presentation, a live web-based presentation, and a recorded web-based presentation. Six items addressed different people who could provide personal support related to telepractice: a familiar colleague, an unfamiliar colleague, a supervisor or administrator, a consultant, a representative from an AAC device company, or a university instructor or professor. For each set of six items, respondents indicated whether they received this type of training or support *never*, *in the last 3 months*, *in the last 4-12 months, more than a year ago,* or *more than five years ago.* For this

study, items were recoded into two variables for analysis: (a) receipt of any of the six types of training on telepractice in the last 12 months and (b) receipt of personal support from any of the six types of people in the last 12 months. The new training and support variables were coded as dummy variables (i.e., 1 = any in the last 12 months, 0 = none in the last 12 months).

Open-Ended Questions

We analyzed responses to a total of 15 open-ended questions that were distributed throughout the survey. The survey utilized branching logic, so participants were not asked all 15 questions. Instead, participants were asked specific questions based on their responses to earlier questions in the survey. Responses to open-ended questions were optional, but 93.6% of the participants responded to one or more of the open-ended questions (n = 338). The open-ended questions addressed (a) the reasons SLPs began, stopped, or did not use telepractice (3 questions utilizing branching logic); (b) factors that impacted whether SLPs used telepractice and the type of services they provided (e.g., direct, consultation/coaching; 2 questions); (c) whether SLPs thought they would continue using telepractice to provide direct or consultation/coaching services after the COVID-19 pandemic subsided (6 questions utilizing branching logic); (d) situations when SLPs would find it beneficial or not beneficial to use telepractice (2 questions); (e) advice for using AAC telepractice; and (f) additional comments. Participant responses ranged from a single phrase to a paragraph in length, but most contained multiple ideas across a few short phrases or sentences.

Data Analysis

Quantitative Analysis

We conducted two sets of preliminary analyses. First, we investigated whether there were any significant differences between included participants and those who were excluded because

they exited the survey before completing survey items required for the present analysis. Using chi-square tests, we found only two significant differences: included participants were (a) more likely to work in rural settings (i.e., 29.1% of included participants worked in rural settings v. 9.1% of excluded participants $\chi^2 = 6.08$, $p = .01$) and (b) less likely to work in large urban settings (i.e., 16.6% of included participants worked in large urban settings v. 33.3% of excluded participants $\chi^2 = 5.72$, $p = .02$). Second, we examined the distribution of the *Views of AAC Telepractice* scores use a Shapiro-Wilk's test (Shapiro & Wilk, 1965) and a visual inspection of a histogram, normal Q-Q plot, and box plot. Scores were non-normally distributed ($p < .05$), with a skewness of -0.50 ($SE = 0.14$) and a kurtosis of 0.35 ($SE = 0.27$). Therefore, we used nonparametric analyses that do not make assumptions about normal distributions of the dependent variable (Conover & Iman, 1981).

To address the first research question, we calculated descriptive statistics to summarize each individual item addressing the views of SLPs about AAC telepractice. Regarding our second research question, we calculated Spearman correlations to determine the association between the independent variables and the dependent variable (i.e., *Views of AAC Telepractice*; see Table 2). We then conducted a series of two-tailed Mann-Whitney *U* tests to test our hypotheses about differences in the views of SLPs based on categorical variables: (a) being new to working with students who use AAC, (b) having already used telepractice to serve children aged 3-21 prior to the start of the COVID-19 pandemic, (c) receipt of training on AAC telepractice in the last year, and (d) receipt of personal support on AAC telepractice in the last year. Regarding the third research question, we used a series of two Wilcoxson signed-rank tests to investigate differences in SLPs' views: first, related to the use of telepractice for consultation/coaching services as compared to direct services and second, related to the use of

telepractice within the context of the COVID-19 pandemic as compared to outside this context. The full set of participants' responses (i.e., *strongly disagree* to *strongly agree*) was used for these analyses.

Qualitative Analysis

We conducted qualitative content analysis (Patton, 2015) of the responses to open-ended questions using an inductive coding process that followed the guidelines outlined by Saldaña (2013) and consisted of three phases. In Phase 1, the first author first imported survey responses into Dedoose (Version 8.3.35), a web-based program for qualitative analysis, and then created a report of all responses ordered by participant. The first and second author independently read this report and memoed about salient concepts related to the third research question. Both team members then met to discuss these memos and generate an initial list of codes. Phase 2 consisted of coding using this initial list as a guide. The first and second author met in a series of analysis meetings and used Dedoose to mark each excerpted survey response with one or more codes. Each piece of data was compared with all other data to determine whether a new code was needed, or whether the response was associated with a previously mentioned code (Creswell, 2003). After coding all of the survey responses, Phase 3 began with a meeting with the first, second, and fourth authors to critically evaluate codes and discuss patterns. The team grouped codes into categories and organized these categories into themes. Following this, codes were reviewed to search for confirming and disconfirming evidence.

Results

SLP Views Regarding the Utility of AAC Telepractice

Figure 1 displays data about the proportion of SLP respondents who agreed, disagreed, or were undecided about each item related to views about AAC telepractice. Overall, views about

AAC telepractice were varied, with the full scale of responses (i.e., 1-5) used for all items. The ratings were the highest and most consistent for Items 5 and 7, which were statements that (a) children using aided AAC were good candidates for receiving consultation/coaching services through telepractice (M = 4.34, SD = .86) and (b) benefits can come for parents or other family members by using telepractice (M = 4.35, SD = .83). The ratings were the lowest and the most widely distributed for Item 3, which was a statement that AAC services provided through telepractice can be of the same quality as those of traditional, face-to-face services (M = 2.83, SD = 1.28), and Item 10, which was about SLPs' confidence in their own abilities related to AAC telepractice (M = 3.19; SD = 1.21). The median response was *Undecided (3)* for Items 1, 3, 4, and 10; *Agree (4)* for Items 2, 6, 8, and 9; and *Strongly Agree (5)* for Items 5 and 7.

Correlates of and Differences in Views about the Utility of AAC Telepractice

Table 2 presents the results of the Spearman correlations of each independent variable with one another and with the *Views of AAC Telepractice* dependent variable. Receiving training on AAC telepractice in the last 12 months was significantly and positively associated with *Views of AAC Telepractice* scores ($r_s(317) = .18$, $p < .01$), but the other variables were not. Contrary to our hypothesis, the results of the Spearman correlations did not indicate that the age of the SLP was significantly associated with *Views of AAC Telepractice.* Age was significantly and negatively correlated with being new to AAC, receiving training on telepractice, and receiving personal support on telepractice, although no correlations were strong.

Table 3 presents the results of the Mann-Whitney U tests used to examine differences in *Views of AAC Telepractice* scores based on the categorical variables of interest. The result of the Mann-Whitney U test was significant only for training on AAC telepractice. Specifically, *Views of AAC Telepractice* scores were higher for SLP respondents who had received any of the six

types of training in the last year (n = 264; *Mdn* = 3.75, range, 1.00 to 5.00) than for SLPs who had not received any training on telepractice in the last year (n = 53; *Mdn* = 3.37, range, 1.00 to 4.88), U = 5090.5, p < .01, r = -.18). Descriptively, the median *Views of AAC Telepractice* scores were slightly higher for the small number of SLPs who were already using telepractice with children aged 3-21 prior to the COVID-19 pandemic (n = 23; *Mdn* = 4.12, range, 2.50 to 5.00), as compared to SLPs who began using telepractice during the pandemic (n = 294; *Mdn* = 3.74, range, 1.00 to 5.00). However, this neared but did not reach significance (U = 2636.5, p = .08) and explained little variance (r = -.10). Contrary to our hypotheses, there were no significant differences (a) for SLPs who were new to working with students who used aided AAC compared to those with more than three years of experience, or (b) for SLPs who had received personal support related to AAC telepractice, compared to those who had not received personal support (see Table 3).

SLP Views about When and How to Use AAC Telepractice

Findings from Quantitative Analyses

The results of the first Wilcoxson signed-ranks test indicated that SLPs viewed telepractice more positively as a means of service delivery during the COVID-19 pandemic (*Mdn* = 4.0, range 1.0 to 5.0) than generally or outside the pandemic (*Mdn* = 3.0, range, 1.0 to 5.0), Z = -10.25, p <.01, r = -.41. Specifically, 171 SLP respondents (53.94%) agreed more with the statement that telepractice was an appropriate model of service delivery for children who use aided AAC *during* the current COVID-19 pandemic than they did *generally* or outside of this context; 124 (39.1%) rated these statements the same, and 22 (6.9%) agreed more with the statement that telepractice was generally an appropriate model. The results of the second Wilcoxson signed-ranks test indicated that SLPs more favorably thought children who use aided

AAC were good candidates for receiving *consultation or coaching* services through telepractice (*Mdn* = 5.0, range 1.0 to 5.0) than *direct services* (*Mdn* = 3.0, range, 1.0 to 5.0), $Z = -11.47$, $p < .01$, $r = -.46$. Most SLP respondents (n = 183, 57.8%) viewed consultation/coaching more favorably than direct services; 128 (40.4%) rated these the same, and only six (1.9%) viewed direct services through telepractice as being more favorable.

Findings from Qualitative Analyses

SLPs reported a variety of viewpoints about when and how to use AAC telepractice, but a fairly consistent set of factors was evident to influence or shape their responses. Our research team decided to name the codes about these factors as questions. We chose to do this because we felt that questions best captured and communicated the idea that these were complex issues. In essence, our findings suggest that SLPs seemed to be asking themselves these questions as a means of driving their thinking about when and how to utilize AAC telepractice.

The most important influence to when and how SLPs thought it was useful to use AAC telepractice seemed to be related to their foundational perspective (i.e., how they defined telepractice or what they thought did or did not constitute telepractice). The two questions which comprised SLPs' foundational perspective were: (1) *Is telepractice a supplementary tool or as an all-or-nothing decision about service provision?* (2) *What constitutes telepractice, and how broadly or narrowly is it defined?* Related to the first, some SLPs discussed telepractice as if it had to be an alternative to in-person services, while others discussed its application more flexibly as a tool that could be used on its own (e.g., during the pandemic, based on health needs of a student, to lesson travel demands) or in conjunction with in-person services (e.g., supplement once-a-month clinic visits with weekly telepractice visits or supplement direct services in school with family coaching through telepractice). Related to the second question, some SLPs seemed

to consider telepractice as being equated only to videoconferencing while others included a variety of technologies and methods in their definition (e.g., text messages, emails, phone calls, recorded videos). These two foundational perspectives about telepractice were what seemed to be the most influential factors in how SLPs thought about conditions under which AAC telepractice would be appropriate or beneficial. SLPs who held more flexible, comprehensive views about telepractice (i.e., that it could be a supplement to in-person service delivery and that it can involve a variety of synchronous and asynchronous technologies and methods) seemed to view the utility of telepractice more positively than those who had narrower or more restricted ways of thinking about telepractice.

These foundational perspectives also seemed to inform all subsequent questions SLPs considered about when and how to use AAC telepractice. Subsequent considerations centered around three broad categories: (a) viability of service delivery options, (b) considerations related to the child and family, and (c) broader resources and constraints. Under each category, SLPs seemed to ask themselves multiple questions that drove their thinking. These questions are presented in Table 4 with descriptions and example quotes from survey responses.

Discussion

The COVID-19 pandemic has rapidly and substantially increased the use of telepractice to provide services to individuals with IDD, including for AAC-related communication services for children with complex communication needs. Given that empirical knowledge about AAC telepractice is still emerging, there is a critical need for research in this area. Understanding the views of service providers related to AAC telepractice is an important part of this needed research, especially because practitioners who have narrow views about telepractice or limited understanding about how it can be utilized effectively may be resistant to its use and may

provide services that are ineffective (Iacono et al., 2016; Tucker 2012b). As a key first step in addressing these needs, we conducted and analyzed a web-based survey of the views of SLPs in the United States on the use of telepractice with children aged 3-21 years who used aided AAC. The findings of this research extend prior knowledge about AAC telepractice and the related views of service providers in several important ways.

Results of this survey indicated that the views of SLPs about AAC telepractice varied fairly widely, although these views were generally more positive than negative. Prior research has suggested that negative attitudes about telepractice may be a primary barrier in its translation into practice and may contribute to undesired or ineffectual practices (Iacono et al., 2016; May & Erickson, 2014). Prior research also suggests there may be disparities between the attitudes of service providers and the attitudes of families related to telepractice. For example, Iacono et al. (2016) found that family attitudes toward telepractice were more positive than SLPs anticipated them to be. However, research on the views of service providers about telepractice is limited.

To our knowledge there is not currently any other available research on service providers' views of telepractice for children with IDD during the COVID-19 pandemic, particularly children with complex communication needs. It is important to consider the findings of this study in light of the broader contextual backdrop of the pandemic. In nearly all cases, SLPs and the children and families they served were experiencing telepractice for the first time during the pandemic, as less than 10% of the respondents reported they had been using telepractice to serve children prior to the pandemic. Given the context of this sudden and unexpected shift in service delivery, the level of positivity of participating SLPs about the utility of telepractice is noteworthy.

Some SLPs did respond to the open-ended survey questions in ways suggesting they only

considered telepractice to be useful or appropriate when in-person services were not an option. However, there was also a sizeable portion of SLPs whose responses indicated they viewed telepractice as a beneficial tool in its own right, not just during the pandemic. Many SLPs even signaled their interest in or plans to continue using telepractice in the future, after the pandemic. Most noteworthy, SLPs who viewed telepractice the most positively considered it to be particularly useful to increase support for family involvement in AAC intervention, mitigating barriers to and increasing services and supports for families themselves. This leads us to wonder — What can the field learn in this crisis that could help during business-as-usual circumstances after the pandemic? From this crisis, can the field learn how to utilize telepractice in ways that would have a positive change on the involvement of families and the support they receive when their children are learning to use aided AAC?

Based on our analysis of the open-ended survey responses, foundational views about telepractice seemed to be key drivers in how SLPs thought about when and how to use telepractice as a service delivery option. Specifically, these foundational views were in two areas: (a) whether telepractice was viewed as if it had to be a replacement for in-person services or as a tool that could be integrated more flexibly as a part of service delivery, and (b) how SLPs personally defined telepractice, and the extent to which their concept of telepractice narrowly focused only on videoconferencing or included multiple technologies and asynchronous and synchronous methods. Taken together, these views reflected how rigidly or flexibly SLPs thought about telepractice and its utility both within and beyond the pandemic. SLPs who viewed telepractice as being a flexible option for supporting children and their families also viewed it the most positively. These findings build on prior research indicating that telepractice may be the most beneficial when it is approached openly and used in adaptive ways to fit the preferences

and needs of children and their families (Camden et al. 2020).

Another important finding was the differential impact of training on SLPs' views about AAC telepractice. It is worth noting that the survey items specifically asked SLPs whether they had received or participated in training *related to using telepractice for children who use aided AAC*, not simply telepractice more generally. Given the unique aspects of telepractice for children with aided AAC and that many SLPs may also have training needs related to AAC itself (Johnson & Prebor, 2019), it is not clear whether training on telepractice more generally would have had the same differential impact. It is also important to note that this finding is not casual, and there may be multiple reasons why this difference was significant. For example, SLPs who already viewed telepractice more positively may have also been more likely to pursue training related to its use. Further, SLPs' views about the utility of telepractice (what we investigated) are different than actual knowledge and skills to use telepractice to provide effective services. Nonetheless, this finding is still important. Prior research shows that SLPs and other service providers are generally unlikely to receive high-quality training or have practical, hands-on training experiences with telepractice (Grogan-Johnson et al., 2015; Tucker 2012b). Ensuring access to quality training on AAC telepractice may be a critical step for telepractice to fulfill its promise to promote positive outcomes for children with IDD who use aided AAC. Taking the findings of the quantitative and qualitative analyses together, the results of this research suggest that training may have differential impact on improving SLPs views of telepractice by helping them have a clear and robust vision for how telepractice can be used effectively, including (a) through the flexible and strategic use of multiple technologies (e.g., asynchronous modules, recorded video feedback, online forums, email, texts, videoconferencing) and (b) as an adaptive tool that can supplement rather than simply replace in-person services.

Limitations

The findings of this research should be interpreted in light of several limitations. First, because this was a cross-sectional study (i.e., a snapshot of data collected from a sample at just one time point), causality cannot be determined, such as for the differential impact of training. Further, the cross-sectional nature of the study early in the pandemic (May/June 2020) means that many questions remain about how service providers' views related to AAC telepractice might be changing as the COVID-19 pandemic continues to unfold. Future research is needed to examine the factors that contribute to SLPs views about telepractice, and how these factors shape the quality and types of services that are provided to children and youth with IDD. Second, the response rate to this study is not known. It is possible that the recruitment approach could have led to a sample that overrepresented SLPs who were interested in or favorably viewed AAC telepractice. Third, although we combined quantitative and qualitive analyses of the survey responses, this research utilized only one data collection method (i.e., a web-based survey). Future researchers could utilize mixed methods research (e.g., in-depth interviews, observations) to gain a deeper, more comprehensive understanding of the views of service providers about telepractice, the factors that have shaped their views, and the impact of these views on the nature of services they provide. Fourth, we focused on views of telepractice for SLPs working with children and youth through age 21, but not adults. Future research should explore similar issues and questions related to views of telepractice for adult populations and across other disciplines (e.g., occupational therapy, physical therapy).

Conclusion and Future Directions for Research, Practice, and Policy

Although we cannot predict the future, we suspect that service delivery changes resulting from the COVID-19 pandemic will have rippling effects long into the future, including increased

use of telepractice to serve individuals with IDD and their families. With all of the difficulties that have come with the COVID-19 pandemic, we hope that this crisis will ultimately lead to re-imagined and more effective supports for children and their families, including children who use aided AAC. There is good reason to think that the more adaptively telepractice is viewed and used, the more likely it will be that service providers can use it to equitably and effectively improve outcomes for children with disabilities and their families. For example, telepractice used adaptively to respond to the preferences and needs of families may improve the feasibility of providing high-quality family coaching and support related to integrating use of an SGD into day-to-day routines at home. With telepractice, families would not have to travel to in-person trainings, and they could learn communication support strategies within day-to-day routines and their natural home environments. With a robust view of telepractice, family coaching focused on AAC support could certainly include live videoconferencing sessions, but it would not be limited to this. Service providers could also support families though online modules, targeted feedback on video recorded interactions in the home, online forums, text messages, and email (Camden et al., 2020). That said, some families may not prefer telepractice or view it as acceptable, particularly if used to replace rather than supplement in-person services (Yang et al., 2020). Thus, considering the child and family's preferences and resources is crucial. Post-pandemic, we hope that AAC telepractice will be increasingly more family-centered and coordinated within broader services and educational supports.

Given this, there are also clear implications for individuals and organizations who train and support pre-service and in-service practitioners such as SLPs. What will be needed to effectively prepare and support service providers and educators for re-imagined service delivery in the future? How can service providers best be equipped to use both in-person and remote

services to best improve outcomes for children with IDD and their families? These questions provide insight into critical implications for the future. There are also implications of this research for administrators and policy-makers. In the open-ended survey responses, SLPs noted that school district policies often restricted flexible and adaptive uses of telepractice, causing SLPs to utilize telepractice more rigidly and narrowly than they otherwise might have (e.g., not allowing videoconferencing or only allowing videoconferencing; requiring contact with families to occur within certain hours). Doing this may exacerbate inequities in access to services, and ultimately outcomes for children and their families. This underscores the need for policies and guidelines that support service providers and educators well in their aim to meet the needs of *individual* children and families, including through the use of telepractice.

It is also important to note that appropriate policies and guidance related to telepractice will become increasingly important looking forward to a post-COVID-19 era, particularly from school and district leaders. Despite all of the challenges, the COVID-19 pandemic has come with some changes that may make it easier for service providers to engage families. For example, if family members were working from home or newly unemployed because of the pandemic, they may have been more available to participate in telepractice sessions during day-time hours when educators or service providers are working. Whether working within our outside of schools, service providers will need systems-level supports that enable them to engage with families in integrated and effective ways when these contextual factors change.

As a small part of what the IDD field is learning in this COVID-19 era, this study also has broad implications for policy and society. SLPs raised a number of considerations related to funding for telepractice (e.g., reimbursement policies), licensure across states, and other state and federal laws and regulations. Such policies have remarkable potential impact—both positive and

negative— on how therapeutic, intervention, and assessment/evaluation services are and can be provided through telepractice (e.g., AAC evaluation and device trials to obtain a communication device). Continued reform will be needed to ensure these policies support rather than hinder equitable and effective access to services for children and youth who need AAC. Additionally, the current context of telepractice use during the COVID-19 pandemic illustrates the importance of efforts to expand high-speed broadband internet access to underserved and unserved areas, and to ensure HIPAA and FERPA-compliant software (videoconferencing, text messaging apps, etc.) are both user-friendly and readily available to service providers, educators, and families. Addressing these crucial needs for research, practice, and policy can help re-imagine service delivery for the future and ensure strong outcomes for children who use AAC and their families.

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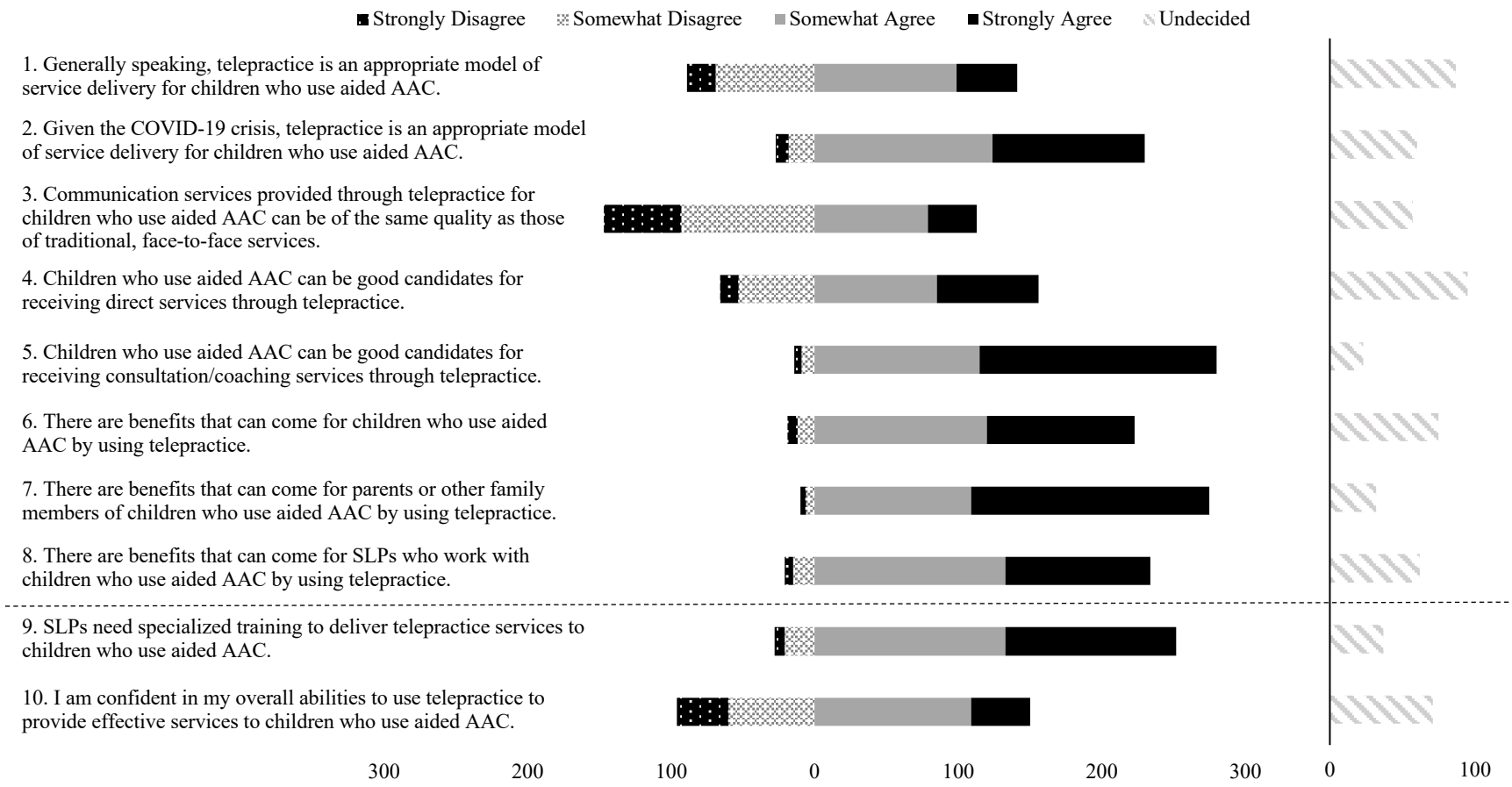
Figure 1

SLP Perspectives on the Utility of AAC Telepractice



Note. Responses to the first eight items above contributed to a participant's *Views of AAC Telepractice* Score. Bars to the left of zero on the main graph represent number of respondents who disagreed with the statement (*strongly* or *somewhat disagree*), while bars to the right of zero represent the number who agreed (*strongly* or *somewhat agree*). The number of SLPs who responded as being *undecided* is represented to scale on the graph to the right.

Table 1. Number and percentage of participating SLPs with various characteristics

	n	%
Gender		
Female	341	94.5
Ethnicity[a]		
White	319	88.4
Hispanic/Latino	17	4.7
Asian or Asian American	14	3.9
Black or African American	13	3.6
American Indian or Alaska Native	5	1.4
Other	8	2.3
Community type[a]		
Rural	105	29.1
Suburban	141	39.1
Small urban (50,000-250,000)	102	28.3
Large urban (<250,000)	60	16.6
Years of experience as an SLP		
1-3	56	15.5
4-10	103	28.5
11-20	99	27.4
> 20	103	28.5
Years of experience with AAC		
1-3	75	20.8
4-10	138	38.2
11-20	100	27.7
> 20	48	13.3
Age range of students who use AAC[a b]		
Preschool (3-5 years)	186	51.5
Early elementary (5-8 years)	237	65.7
Middle grades (9-12 years)	203	56.2
Secondary (13-17 years)	136	37.7
Transition (18-21 years)	67	18.6
IDEA disability categories of students who use AAC[a b]		
Autism	304	84.2
Multiple disabilities	210	58.2
Intellectual disability	206	57.1
Developmental delay	196	54.3
Speech or language impairment	172	47.6
Other health impairment	123	34.1
Orthopedic impairment	64	17.7
Visual impairment (including blindness)	62	17.2
Hearing impairment	43	11.9
Traumatic brain injury	24	6.6
Specific learning disability	24	6.6
Deaf-blindness	17	4.7
Emotional disturbance	16	4.4
Deafness	14	3.9
Communication levels of students who use AAC[a b]		
Pre-intentional	168	46.5
Intentional, prelinguistic	248	68.7
Emerging symbolic	300	83.1
Early linguistic	241	66.8
Proficient AAC	65	18.0
AAC types used by students[a b]		
Low-tech	312	86.4
High-tech	321	88.9

[a] Percentages add to more than 100% because SLPs could select more than one.

[b] Participants reported an average of 38 students aged 3-21 on their caseload at the time of the study (range, 1-150, *SD* = 21.0), of which an average of 10 students used aided AAC (range, 1-150, *SD* = 13.5).

Table 2

Nonparametric Spearman's Correlations for Study Variables (*n* = 317)

Variable	1	2	3	4	5	6
1. Views of AAC telepractice	—					
2. Age	-.10	—				
3. New to AAC[a]	.06	-.52**	—			
4. Use of telepractice before the pandemic[b]	.10	-.03	-.02	—		
5. Training in the last year[c]	.18**	-.10*	.11*	.04	—	
6. Personal support in the last year[d]	.06	-.16**	.18**	-.03	.56**	—

[a] 1 = worked with students who use AAC for three years or less and 0 = worked with students who use AAC for more than four years. [b] 1 = used telepractice with children before the COVID-19 pandemic and 0 = did not use telepractice with children before the COVID-19 pandemic. [c] 1 = any reported training on telepractice in the last 12 months and 0 = no reported training on telepractice in the last 12 months. [d] 1 = reported personal support on telepractice in the last 12 months and 0 = did not report personal support on telepractice in the last 12 months.

* $p < .05$. ** $p < .01$.

Table 3

Results of the Mann-Whitney U Tests and Sub-Group Medians to Examine Differences in Views of AAC Telepractice Scores

	n	*Mdn*[a]	Mean rank	Sum of ranks	*U*	*Z* score	*p*
Experience with AAC							
New to AAC (≤ 3 years)	68	3.88	156.17	38886	7761	-1.05	.29
Greater than 3 years	249	3.75	169.36	11517			
Use of telepractice							
Experience prior to COVID-19	23	4.12	191.37	46001	2636	-1.76	.08
No prior experience	294	3.74	156.47	4401			
Training on telepractice							
Training in last 12 months	264	3.75	166.22	43881	5090	-3.13	< .01
No training in last 12 months	53	3.37	123.05	6521			
Personal support on telepractice							
Personal support in last 12 months	236	3.75	162.99	38465	8616	-1.33	.18
No personal support in last 12 months	81	3.50	147.38	11937			

[a] Median *Views of AAC Telepractice* scores for each sub-group in the sample

Table 4
Codes, Descriptions, and Example Quoted Survey Responses for SLP Views about When and How to Utilize AAC Telepractice

Code and description	Example quoted survey responses
Viability of service delivery options	
1. **Are in-person services a viable option at this time?** *Many, but not all, SLPs reported considering telepractice only or primarily when in-person services are not an option, such as the pandemic. SLPs also considered whether the child had health needs that would prevent in-person services or make them too risky.*	"Telepractice for students using AAC is beneficial if you are absolutely unable to provide direct services, such as the current pandemic or if the student is medically fragile and...is unable to attend school" (SLP 347).
2. Are there geographical-related considerations? *SLPs discussed the benefits of telepractice to alleviate the need to travel long distances or address problems related to insufficient personnel with AAC expertise in the local region.*	"Individuals who find it difficult to travel either because of distance or medical complexity is a slam dunk (if they have the tech and proficiency [for telepractice])" (SLP 313).
Considerations related to the child and family	
1. **To what extent is the focus of services on the child or the family?** *Many SLPs described how telepractice lends itself to increasing the focus on family coaching and consultation, which can have benefits.*	"I try to do at least 15 minutes of an engaging activity [with the child], but if it is difficult for a child to attend to an activity, I then talk with the parent about communication strategies they can use at home" (SLP 20).
2. **What are the child's support needs and how are these best met?** *SLPs described considering factors related to the child's support needs, such as the child's preferences, attention to computer screens, benefit from physical prompting, need for physical activity and movement, and imitation skills.*	"It is extremely beneficial for parents and children to both participate in an AAC telepractice session so children can learn the system and parents/facilitators can be coached simultaneously" (SLP 132).
3. **How do AAC-related factors influence what would be best?** *SLPs described considering factors related to AAC, including how new the child was to using AAC, if the child had access to AAC at home, and type of AAC system (e.g., low-/high-tech, access method).*	"It is difficult to coach parents via teletherapy, as I cannot easily point to what I am referring to. The annotate feature on my teletherapy platform does not show up when I am doing remote support for eye gaze devices" (SLP 285).
4. **To what extent does the family have adequate access to technology and feel comfortable using this technology?** *SLPs described many instances when families did not have adequate access to technology or confidence using technology.*	"One family has only a smartphone for telepractice. This limits the kinds of interaction we can achieve with this child.

5. **What are the family's preferences, availability, and resources, and how do these influence service delivery approaches?**
   SLPs considered factors related to the family, such as the family's preference for service delivery model, time constraints or competing demands impacting participation in therapy sessions, childcare needs (during telepractice or in-person sessions), and distance families had to drive to access clinic-based services, or other travel-related issues.
6. **When using telepractice, what is the impact on children and families?**
   SLPs described possible positive effects of telepractice: (a) increased dosage in services due to ease of scheduling, (b) more frequent contact through asynchronous means (e.g., text messages), (c) increased collaboration among service providers, and (d) increased use of AAC across settings/at home. Possible negative effects described: regression of skills, decrease in buy-in when telepractice was required but inaccessible or not preferred by the child/family.

… My third family has no access to internet/technology adequate for teletherapy" (SLP 8).

"Family access to a video platform has been a big issue for me so far. I have to do my communication through audio only communication which works okay with adults but would be difficult with the kids I work with. … I mostly talk with parents at this time" (SLP 34).

"Really understand the family and individual you are serving and whether telepractice is right for their family dynamic. It's been great for some but not all. Overutilizing can create disparities" (SLP 313).

Broader resources and constraints

1. **How do current policies and funding for services impact decision-making about service delivery?**
   SLPs identified policies related to licensure, their school district or employer, and insurance and Medicaid billing as important determinants of when and how they would use telepractice.
2. **What are the expectations of the school district or employer, including services in the child's IEP?**
   Beyond formal policies, SLPs cited employer or district expectations as a factor that impacts when and how they would use telepractice.
3. **What resources, training, and supports are needed and available to the SLP?**
   SLPs indicated their own need for access to technology, training, and support for telepractice as important considerations.

"[Using telepractice post-pandemic] will depend entirely on laws in my state and the acceptance of my school as a workable modality to provide parent coaching" (SLP 191).

"After trying [telepractice], we found it worked well. I was able to present materials online, could see and hear her responses. … (I had attended a training... They made a pretty convincing case that there was a real place for telepractice and showed how it could be done successfully.)" (SLP 146).

"As a school SLP, it's so hard that I don't have a device of my own! It would be SO much easier to model this in sessions. I…am relying on memory to…coach parents and tell them how to use their talker" (SLP101).