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The Speech-language Pathologist's Perspective on Telepractice Since COVID-19

by

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A thesis

submitted in partial fulfillment

of the requirements for the degree of

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Committee Approval

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February 2, 2021

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RE: Study Number IRB-FY2021-148 : Speech-Language Pathology and Telepractice

Dear Dr. Ramsdell-Hudock:

Thank you for your responses to a previous review of the study listed above. These responses are eligible for expedited review under OHRP (DHHS) and FDA guidelines. This is to confirm that I have approved your application.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

You may conduct your study as described in your application effective immediately. This study is not subject to renewal under current OHRP (DHHS) guidelines.

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if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

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The Speech-language Pathologist's Perspective on Telepractice Since COVID-19

Thesis Abstract - Idaho State University (2021)

The purpose of this study was to update information regarding the perspectives of speech-language pathologists on the use of telepractice (video conferencing technology and all other associated technologies beyond just the schools) as compared to traditional (in-person) delivery models during the coronavirus-era, specifically, in comparison to perceptions identified by Tucker (2012) prior to coronavirus-19. A survey was distributed to 6,431 practicing speech-language pathologists within the United States, with a total of 545 total usable responses.

Although clinicians generally agree that telepractice can be as effective as in-person service delivery, they are hesitant to embrace its use. Further research should explore the reasons behind the hesitation experienced by clinicians to adopt telepractice as a service delivery model. This study will contribute to the evidence-based foundation on which SLPs are encouraged to build their practice. Clinical implications, study limitations, and future directions are discussed.

Keywords: telepractice, service delivery model, speech-language pathology, survey

Chapter I: Introduction

The outbreak of the coronavirus disease in 2019 (COVID-19) brought a pressing need for a model of speech and language services that were more accessible when face-to-face services were not possible. Traditionally, most services have been provided using in-person methods (which include the client and a clinician participating in evaluation and/or treatment activities while physically sharing the same space). Over the past year, cancellations, closures, and concerns for public health safety caused many rehabilitative and habilitative services to implement alternative ways to meet the needs of their clients. The spread of COVID-19 initiated a spike in service providers utilizing telepractice delivery models (including the use of videoconferencing technologies to provide evaluation and/or treatment services at a distance) in lieu of more familiar, traditional in-person delivery models. Prior to COVID-19, 4.6% of certified speech-language pathologists (SLPs) in the United States provided services via telepractice or remotely (American Speech, Language, Hearing Association; ASHA). After the rise of COVID-19, 61% of certified SLPs in the United States are now providing services via telepractice or remotely (ASHA, 2020).

A Brief History of Telepractice

Telepractice saw its beginning as early as the year 1976, when researchers presented auditory stimuli over the telephone paired with visual stimuli given to the client prior to discharge from the hospital. Visual stimuli included filmstrips, workbooks, picture cards, and notebooks. In some cases, an additional individual was required to assist, referred to as an eHelper, ensuring that the visual stimulus matched the current task (Vaughn, 1976). This progressed to the year 1983 when a case-study was conducted with a 54-year-old woman who had suffered a left subdural hematoma resulting in moderate to severe aphasia and severe apraxia of speech. In this case, researchers found the client preferred interaction with a minicomputer

and a Touchtone phone via telepractice rather than in-person treatment (Cross & Fitch, 1983). Other advancements in technology led to the use of videoconferencing in treatment of a voice disorder, first presented in 1999 at the Annual Meeting of the American Laryngological, Rhinological and Otological Society, Inc. (Burgess, 1999). The use of videoconferencing technology was used again in a study comprised of 34 participants using the Story Retelling Procedure to measure performance in both distance and in-person environments (Brennan et al., 2004). Brennan et al. (2004) found no significant difference between results of client performance across settings or factors such as age, education, technology experience, or gender, suggesting that either mode of delivery could be utilized without negatively impacting treatment outcomes. Videoconferencing continues to be the primary way through which service providers administer treatment to clients from a distance, as found in studies published from 2007 through the present day (Lasker et al., 2010; McGrath et al., 2008; Palsbo, 2007; Rietdijk et al., 2020; Steuerwald et al., 2018; Sutherland et al., 2016).

Comparison of Delivery Models

When compared, there are some differences that can be found between telepractice and in-person service delivery models. Traditional delivery methods are administered in a shared physical space and rely on the expertise and control of a trained speech-language pathologist (SLP) to motivate and encourage full participation in all treatment activities. The SLP's role in traditional methods includes provision of an appropriately equipped environment, manipulation of materials, adaptation of complexity, and provision of direct models or physical shaping cues. Telepractice requires additional technology, training with said technology, direct participation from a caregiver to facilitate treatment, and reliable connection to the internet. Additionally, caregiver training is vital in the success of telepractice. For instance, a clinician treating a client

with a severe articulation or phonological disorder may find it more difficult to provide accurate feedback regarding the quality of the client's productions due to limited or poor audio quality, indicating the need for a reliable caregiver or eHelper to facilitate interpretation of the client's production. This can be compared to the type of feedback commonly given to a client with a language disorder, which may be focused primarily on use of language (structure, object naming, etc.) and therefore does not require the aid of a caregiver.

It is also important to consider the physical abilities of an individual participating in telepractice. For example, a young child may have difficulties functionally navigating a mouse during treatment. Adding physical constraints (such that might be addressed in occupational therapy) only raises the complexity of tasks required throughout treatment on top of targeted goals. Some important questions to ask a client before beginning telepractice may include (1) what their comfort level is using a computer, (2) what is the preference for type of mouse (physical or touchpad), and (3) what is the comfort level navigating various software programs (Word, PowerPoint, games, etc.) or simply the internet. In each of these situations it is imperative that a caregiver be appropriately trained in the types of productions considered acceptable, what software will be utilized, and basic troubleshooting skills (with the knowledge that no training can replace formal education and clinical experience).

While these hurdles may dissuade SLPs from providing telepractice, when looked at closely, these two delivery models are, at their core, quite similar. Both telepractice and traditional delivery models require a highly skilled clinician, or supervised aid, to provide quality services. Access to appropriate materials and assessments, caregiver involvement, strong interpersonal skills, reliable organizational skills, coaching, and motivational interviewing skills

are all among the list of abilities and training found in an effective SLP, regardless of setting or delivery model.

Telepractice can, and has been, used in schools, medical centers, rehabilitation hospitals, community health centers, outpatient clinics, universities, clients' homes, residential health care facilities, childcare centers, and corporate settings just as traditional in-person methods can be; "there are no inherent limitations to where telepractice can be implemented" (American Speech-Language-Hearing Association; ASHA Professional Issues: Telepractice, n.d.). All places where in-person services are the norm. Clinicians may find that some clients prefer a telepractice model. A client with traumatic brain injury (TBI) or aphasia (a disorder characterized by limited access to language) may prefer the ease of home-based treatment, creating a sense of fuller independence.

In fact, Hall et al. (2013) conducted a systematic review for which inclusion criteria required publications to (1) contain at least one dependent variable involving the participant and the results of their assessment "and/or the fidelity of implementation of an intervention, assessment, and/or consultation," (2) present use of telepractice to deliver services, and (3) include at least one participant with a diagnosis of aphasia (Hall et al., 2013, p. 32). Researchers found that "all [studies] reported no significant differences between assessment scores and results obtained in each therapeutic environment" (Hall et al., 2013, p. 32). While previous research supports the use of telepractice overall, the sudden shift to a new service delivery model forced by a worldwide pandemic brings a set of unique challenges. Among 27,041 SLPs recently surveyed, ASHA (2020) found that the top three most challenging factors of telepractice were delivering clinical services via telepractice, the inability to provide necessary services to those who need them, and time and capacity to adequately balance personal and professional

responsibilities. It is unclear if these challenges are unique to telepractice as a service delivery model, or to the overwhelming and unfamiliar nature of COVID-19. This study hopes to address the changes experienced by clinicians participating in telepractice pre-COVID-19 and post-COVID-19.

Current Research

Through this study, we will identify the perspectives of practicing SLPs regarding telepractice and the impact of COVID-19 on these perceptions. A number of researchers have begun to explore this topic. In fact, a study conducted at the India Institute of Speech and Hearing in 2017 (pre-COVID-19) found that 95.55% of SLPs and audiologists surveyed were aware of telepractice as a service delivery model, however only 12.19% engaged in its use (Mohan et al., 2017). Participants agreed that there was an “urgent need to meet the demands of the individuals seeking services in their respective states across India,” and that telepractice could be an appropriate method through which to provide treatment and assessment services (Mohan et al., 2017, p. 74). The primary concerns of the participants were sufficient knowledge, familiarity with, and availability of technical infrastructure, the need for formal training and certification, and the security and privacy of their clients (i.e., private software domains and legal guidelines and policies; Mohan et al., 2017).

In another study, clinician’s perspectives were explored regarding the provision of services via telepractice to families of children who were deaf or hard of hearing under Part C of the Individuals with Disabilities Education Act (IDEA; Behl & Kahn, 2015). A total of 27 respondents participated in the study, representing 11 total early intervention programs (Behl & Kahn, 2015). Researchers found that the majority of participants had between 1 to 3 years of experience implementing telepractice (Behl & Kahn, 2015). Respondents received training

primarily in an educational program or from an employer (46%), or they were self-taught (38%; Behl & Kahn, 2015). The authors suggest that additional training “will become increasingly important as the prevalence of telepractice grows”, which may facilitate provider interest in the delivery model (Behl & Kahn, 2015, p. 11). Further research is likely required in this area to explore the need for standardized training and the establishment of best practices. Additionally, Behl and Kahn (2015) gathered data regarding the hardware and software utilized by the clinicians. The hardware ranged from the use of Macs and personal computers, tablets, built-in or external webcams, speakers, and microphones. Many of the participants (65%) lent hardware to their clients so that they might participate in treatment, generally iPads or iPad minis (Behl & Kahn, 2015). Most commonly, the software used consisted of Skype and FaceTime, with a small number of respondents using Vidyo, Zoom, GoToMeeting, WebEx, and Adobe Connect (Behl & Kahn, 2015). Only 15% of participants were satisfied with their videoconferencing experience (Behl & Kahn, 2015). The largest challenges as identified by the participants of this study were internet connectivity and comprehensive training in the skills required to administer services via telepractice (Behl & Kahn, 2015).

An additional survey, titled *Perspectives of Speech-Language Pathologists on the Use of Telepractice in Schools: The Quantitative View*, conducted in Pennsylvania and directed toward school based SLPs, found that, of 170 participants, 10 had experience providing telepractice in the school setting (Tucker, 2012a). The purpose of this study was to discover the “SLPs’ knowledge, attitudes, and beliefs toward telepractice” (Tucker, 2012b p. 48). An interesting trend identified in this study was that the willingness or interest in using telepractice “was inversely related to age” (Tucker, 2012a p. 61). The researcher hypothesized that this may be due to younger professionals being more accustomed to using technology as compared to older

professionals (Tucker, 2012a). The largest concerns for participants of this study were the validity of assessments administered, the effectiveness of services provided, and rapport building via telepractice. This survey is the basis for partial replication for the current study, as we are looking to compare pre-COVID-19 perceptions with post-COVID-19 perceptions. In an additional publication, the qualitative information gathered throughout this study was explored, which will not be included in the partial replication (Tucker, 2012b).

The research found in each of the above-mentioned studies is valuable and important, however the focus of the current study is to understand the impact COVID-19 has had on the described perspectives of clinicians. Research in this area has already begun. A study conducted by researchers in India looked at clinician perspectives of telepractice during the COVID-19 pandemic. Of the 84 participating SLPs, 85% held a mostly pediatric caseload (Aggarwal et al., 2020). While the overall outlook toward telepractice was positive, network issues, lack of cooperation/difficulty in keeping the child attentive to the task, convincing parents of the validity of telepractice, misinterpretation of instructions given, and lack of resources were cited as major challenges (Aggarwal et al., 2020). In addition, researchers of this study concluded that there is a need for “further legislations or guidelines that ensure the use of secure networks, data privacy, and professional norms while using telepractice” (Aggarwal et al., 2020, p. 5).

Researchers in Hong Kong looking at telepractice in the time of COVID-19 focused on (1) the current practice of telepractice in Hong Kong, (2) what SLPs in Hong Kong knew about telepractice and how was it perceived, and (3) what training had been completed and how that training could be further developed (Fong et al., 2020). Forty-seven of the total 135 participants had provided telepractice services; 72.3% had used telepractice for less than 3 months, 8.5% for 3 to 12 months, 6.4% for 1 to 3 years, and 12.8% for more than 3 years (Fong et al., 2020). The

majority of these clinicians provided services for speech sound disorders (83%), followed by language disorders (77%), and social communication disorders (62.2%; Fong et al., 2020). Of these 47 participants, 51.1% felt telepractice was less effective than in-person delivery and 25.5% felt it was similarly effective (Fong et al., 2020). The remaining 88 participants who had no experience with telepractice were asked a series of questions regarding their impressions of telepractice. When surveyed, 56.8% stated that telepractice could be used in speech-language pathology, 20.8% stated that telepractice could not be used for speech-language pathology, and the remaining participants were unsure (Fong et al., 2020). When asked if the appropriateness of telepractice was dependent on the clinical population, 89.6% of participants responded “strongly agree” or “agree” (Fong et al., 2020).

Some research has shown that clinicians feel low levels of self-confidence and large increases in their workload when implementing telepractice (Sylvan et al., 2020). In a survey study conducted by Sylvan et al. (2020), a total of 280 school-based SLPs across the United States responded with 59% agreeing or strongly agreeing that they felt confident in their ability to support their students via telepractice, 24% of respondents feeling that their caseload had become unmanageable, and 48% reporting an increase in their workload while remaining manageable (Sylvan et al., 2020).

Further of 6,427 certified SLP respondents in the United States in a recent survey sent out by ASHA, 55% reported feeling somewhat concerned about patients' access to speech-language pathology services (including cognitive, communication, and swallowing) due to lengthy intensive care unit (ICU) stays and ventilator usage related to COVID-19 (ASHA, 2020). When asked about their needs to treat clients with COVID-19, SLPs cited “adequate access to personal protective equipment...more information for referring professionals about the scope of SLP

services for patients recovering from COVID-19...[and] continuing education to increase competency” as their priorities (ASHA, 2020).

There are some limitations to these studies, primarily small sample sizes ranging from 84 (Aggarwal, 2020) to 280 (Sylvan et al., 2020). One goal of the present project is to reach a larger number of SLPs and obtain more responses. Additionally, two of the three above mentioned studies were conducted outside of the United States. This information is valuable, but not necessarily reflective of the SLP experience within the United States. In addressing these two limitations, the perceptions and experiences of SLPs in the United States during the COVID-19 pandemic will be better reflected via the results of the current study.

The Client and Clinician Experience

Effectiveness of services provided using telepractice is an area of particular interest to researchers and clinicians alike; to begin with, it is essential to establish efficacy to ensure quality of care and promote payment of services by insurance companies. Freckmann et al. (2017) found that “telepractice does not appear to have a negative effect on [clinician-client] rapport” (p. 287). Telepractice has been indicated as an appropriate, viable, cost-efficient, and effective means for providing services (Coufal et al., 2018; Fairweather et al., 2017), suggesting that there is little impact on the effectiveness of services provided when in comparison to traditional in-person service delivery. This research is limited, however, in that the studies cited include narrow sample sizes; some ranging from two participants (Baharav & Reiser, 2010) to 34 participants (Grogan-Johnson et al., 2010). Others focused on client experience (Coufal et al., 2018), seeking information regarding “satisfaction with online assessment and treatment, process and outcome, comfort in receiving services online, usability of the technology involved[, and] preference for online or face-to-face delivery” (Theodoros et al., 2018, p. 182).

In one study, 482 parents of children requiring early intervention were asked two questions; 1) do their feelings of self-efficacy “differ when. . . intervention is delivered through telepractice versus in-person?” and 2) can any of the differences noted in feelings of self-efficacy be accounted for by “(a) caregiver characteristics, (b) child characteristics, and/or (c) early intervention program characteristics?” (McCarthy, 2019, p. 35). A two-group comparison design was used on a convenience sample collected from a single organization that offered treatment through both modalities. Each participant received services exclusively through either telepractice or in-person programs, never both. Participants were required to be a caregiver of a child who was deaf or hard of hearing, was between the ages of 2 months and 8 years and had been enrolled in one of the two offered programs for a minimum of 2 months. Using the *Scale of Parental Involvement and Self-Efficacy* (SPISE; Desjardin, 2003), researchers found that the “delivery mode had no significant effect overall on subscale scores” (McCarthy, 2019, p. 37). The only exception to that finding being a small subgroup of participants whose children had a unilateral hearing loss; these participants were receiving services through telepractice and reported lower levels of self-efficacy. This group, however, only contained 6 participants, suggesting a Type I error rather than a true difference. Results indicated that the use of telepractice is unlikely to affect caregiver confidence in ability to participate in treatment provided to their child. Having access to this kind of research can provide the reassurance that some caregivers may need to trust the efficacy of an unfamiliar delivery model.

Perspectives of SLPs on the Use of Telepractice in Schools

Because COVID-19 has so swiftly changed the nature of service delivery across the field of speech-language pathology in the past months, a replication study with a different, larger cohort of practicing SLPs is warranted to assess perspectives related to use of telepractice found

by Tucker in 2012, and by ASHA in 2002. In 2012, Tucker conducted a follow-up to a survey distributed by ASHA in 2002. The focus of ASHA's survey was to gather information regarding SLPs overall perception of telepractice in schools. In seeking to "identify reasons for its limited adoption and inform the development of a framework from which to build acceptance and confidence". Tucker (2012) used portions of the ASHA survey and made modifications to reflect the perspectives of school based SLPs. Tucker (2012) sent out a 35-item survey consisting of 11 of the original 21 questions. In addition, 2 demographic questions and 17 items based on previous interview-based research (identifying SLP attitudes and beliefs with regard to the use of telepractice in speech-language pathology) were included. Finally, 4 open ended questions were included to allow SLPs to describe their reasons for using, or not using, telepractice. Participants included 1,900 ASHA certified SLPs identified via the state's speech-language pathology listserv (Pennsylvania). A total of 8.9% (170/1900) of surveys circulated were returned.

Results showed that, overall, "respondents were concerned about the validity of assessment administered via telepractice", ability to sufficiently establish rapport with their clients, and ability to provide treatment via telepractice that was as effective as in-person treatment (Tucker, 2012, p. 61). In addition, most respondents indicated a need for guidelines and procedures for telepractice within the school system.

The majority of respondents had worked as SLPs for more than 25 years, making up 43.35% of the total respondents. A small percentage of the participants (6%) reported use of telepractice in the schools (10/170), and of this 10, only 3 reported current use of telepractice. Three of these 10 respondents were supervisors of SLPs using telepractice, and not using it themselves. Five reported use of telepractice with students in middle though high-school, and all reported use with students in elementary school, with the most frequent location being from a

special education center. The SLPs “with a current or past telepractice caseload indicated that the predominant service was treatment (85.7%), followed by consultation (42.8%), and screening (28.6%)” (Tucker, 2012, p. 63). In addition, when asked to indicate client’s areas of impairment, responses were as follows: language disorder (71.4%), fluency (26%), learning disabilities/autism spectrum disorders/attention deficit disorders (14.2%), and articulation/phonology (1%). When asked which diagnoses were least appropriate for telepractice, respondents provided the following responses: all areas were appropriate for telepractice (71.4%); birth to three, dysphagia, or motor speech disorders (57.1%); articulation/phonology, autism spectrum disorders, fluency, or preschool (42.8%); hearing impairment, mental retardation, psychiatric/emotional disturbances, or voice (28.6%); and learning disabilities (14.2%). Seven of the 10 respondents reported the presence of an eHelper, who’s duties ranged from assisting the client to remain on task, providing technology support, and even attending individualized education program meetings. The majority of the 10 SLPs had received prior training in telepractice (86.7%), some indicated that they did not desire additional training (40%), and still others wanted specific technology procedures and student selection criteria (30%).

A five-point Likert scale was administered to all 170 participating SLPs, ranging from strongly agree to strongly disagree. The majority of participating SLPs agreed that there was a need for procedures and guidelines, confidentiality, informed consent, ethical considerations, technology procedures, and student selection criteria for telepractice. The areas of greatest disagreement over perceptions of telepractice related to establishing rapport, administering assessment, and its effectiveness when compared to in-person service delivery. Speech-language pathologists appeared generally neutral about the use of telepractice in the schools.

When asked to cite reasons for the use of telepractice, SLPs indicated student benefit (31.8%), rural or other location reasons (31.8%), cost/travel time (19.4%), ease SLP shortage (17.6%), collaboration (11.2%), benefits for SLPs (2.9%), benefits for families (.59%), and there was no reason to use telepractice (8.8%). Reasons against the use of telepractice were student type/age (31.8%), impersonal (31.2%), lack of physical contact (14.1%), effectiveness (13.5%), technology standards or failures (10.6%), lack of collaboration (8.8%), cost (8.8%), ethical concerns (6.5%), lack of support (4.7%), lack of standardized assessments (2.4%), lack of trained SLPs (1.8%), and family requests or lack of ability to handle telepractice (1.2%). Overall, for use of telepractice in the schools, there were more negative responses than positive. However, for the use of telepractice in other settings outside of school there were more positive than negative responses.

Tucker (2012) concluded that most respondents remained “reticent” or in opposition to the adoption of telepractice, “offering neutral or negative attitudes” (p. 69). Factors contributing to the low numbers of SLPs participating in telepractice (1.8% of participating SLPs reported telepractice experience) may be accounted for by age of respondent SLPs, disinterest in exploring technological options, technology budget constraints in school districts, and administrator “interest and attitudes toward telepractice” (Tucker, 2012, p. 69). These results may reveal a greater willingness in younger SLPs to adopt telepractice as a delivery model (Tucker, 2012).

Chapter II: Purpose

Given the recent change in service delivery brought on by COVID-19, the **overall objective** of this study is to update information about perspectives of SLPs on the use of telepractice in the schools and extend perspectives to the use of telepractice in other settings, during the COVID-era. We considered progress needed toward establishing procedures and guidelines for telepractice. Our **central hypothesis** was that there would be observable differences between SLP's perceptions of telepractice pre- and post-COVID-19. The central hypothesis was based on research indicating differences of opinion found between SLPs that were familiar with telepractice and those that were not. Now that SLPs are more familiar with telepractice as a result of COVID-19, we hypothesized perceptions related to the effectiveness and efficiency of assessment/treatment are similar between the different service delivery options. Further, we aimed to gain a deeper understanding of clinician satisfaction and comfort level as it relates to mode of service delivery. The **rationale** for this project was that clinicians, clients, researchers, and others motivated by the use of evidence-based practice in the field of speech-language pathology (e.g., insurance companies, state programs, etc.) would have additional foundational information for the implementation of telepractice delivery models based on findings. Providers could more confidently declare support or discourage use of telepractice given study results. Ultimately, the **long-term goal** of this research is to improve client outcomes.

We tested our central hypothesis by pursuing the following **specific aims** within the framework of a nationally distributed online survey. We explored the association between various characteristics (education and work experiences, attitudes related to providing telepractice versus in-person service delivery, and geographical location) and an SLPs:

- **Aim #1**. Perception of telepractice versus in-person service delivery models, and

- **Aim #2**. Sense of confidence when providing telepractice versus in-person service delivery (in particular comparison to findings from Tucker, 2012).

Chapter III: Methods

A survey (see Appendix), approved by the Human Subjects Committee at Idaho State University, was sent out to SLPs via email. The focus was to update information regarding the perspectives of SLPs on the use of telepractice (beyond just the schools) during the COVID-era and progress needed toward establishing procedures and guidelines. Survey questions queried clinician demographic information (time providing in-person/telepractice services, location, client diagnosis, treatment/assessment types, etc.), and opinions regarding widespread use of telepractice, benefits or disadvantages of telepractice, effectiveness of telepractice, and perceptions of a need for additional guidelines and/or procedures related to telepractice. Some survey questions were adapted from the 2012 survey conducted by Tucker, modifying the focus from a primarily school-setting to more comprehensive settings (including, but not limited to private practice, hospitals, schools, and skilled nursing facilities). For responses to be included in data analyses, respondents needed to be ASHA certified, hold a current license to practice in their state/the state wherein their clients reside, and have experience implementing both in-person and telepractice delivery models. Also, an agreed upon percentage of respondents (e.g., 75% of respondents) were needed to answer each question in order for the question to be included in the results. Responses were recorded via Likert scaling and multiple choice.

Participants

As of the end of 2019, there were more than 181,000 SLPs nationally, according to records reported by ASHA. In order to generalize survey results to the clinical population as a whole, a sample size of 600 would have guaranteed a margin of error no greater than 4% for 95% confidence intervals for proportions (Daniel & Cross, 2013). Based on the predication that only 20% of participants would return surveys, we emailed a random sample distribution of 6,431 SLPs who either worked in an affiliated college/university department (e.g., SLP,

Communication Sciences and Disorders, etc.), or had a publicly listed practice email address in all states across the nation. In addition to an initial email requesting participation and providing the survey link, one follow-up reminder email was sent out, again requesting participation, and providing the survey link. Anonymous responses were obtained.

Data Analysis

Descriptive statistics (frequencies, percentages, mean, and range) were calculated to describe demographics and response rates. Survey comparisons between SLPs who work in a college/university, school, or other clinical setting are represented for demographics in Table 1 and clinical experience in Table 2; comparisons between traditional in-person versus telepractice service delivery models are represented for clinical experience in Table 3; responses to Likert scale questions related to the impact of COVID-19 on clinical practice and perceptions of telepractice are presented in Table 4; and reasons for not using telepractice as a service delivery model are presented in Table 5. Descriptive statistics are reported below.

Chapter IV: Results

Of the 6,431 surveys emailed, 604 (9.4% response rate) were returned and 545 (90.2% of the total response rate) were useable. Surveys were excluded for a variety of reasons: participants responded “no” to informed consent, did not respond to over 75% of relevant survey questions, were not ASHA members, were not speech-language pathologists, or did not respond to the question related to clinical work setting.

Descriptive Data

Questions were asked related to the SLPs’ demographics, clinical practice, experienced impact from COVID-19, and perceptions of telepractice. This allowed for comparisons with Tucker (2012) and between the 545 respondents: 249 reported working in a college/university setting, 259 in a school setting, and 37 in another setting (e.g., hospitals, private practice, or other). None (or a small number like two) of the respondents reported working in a non-residential healthcare facility, residential healthcare facility, or home health, so individuals from these settings were excluded from the data below.

Demographics

Respondents who work in a college/university versus school settings (excluding *other* for the purpose of reporting because there were so few in this category) had similar proportions of those with master’s degrees, PhD’s and other doctoral degrees, only differing at most by 3.49% between variables (Table 1). There was a higher percentage of SLPs who work in the schools with a master’s degree and responded, and there were higher percentages of SLPs who work in a college/university setting with PhD and other doctoral degrees who responded. The geographical locations of SLPs in college/university versus school settings were also very similar, with the sample only differing at most by 2.75%. There was a greater percentage of SLPs in the school

setting who responded from New England, East North Central, West North Central, South Atlantic, East South Central, and Pacific regions. There was a greater percentage of SLPs in the college/university setting who responded from Mid-Atlantic, West South Central, Mountain, and other (combination of regions). With respect to population density in the area surrounding work settings, there were more SLPs in the school setting who responded from rural (a difference of 0.74%) and suburban (a difference of 7.34%) areas, and more SLPs in the college/university setting who responded from urban (a difference of 5.87%) areas.

Clinical Experience by Work Setting

The clinical work experience of survey respondents is described in Table 2. Of those who reported working in a college/university setting, the majority worked with clients between the ages of 5;1-12;0 or 18;1-65;0 (16.88% and 14.86% respectively). Participants who reported working in a school setting generally worked with clients between the ages of 3;1-5;0 or 5;1-12;0 (8.26% and 32.48% respectively). Across all settings, participating SLPs reported a preference for in-person service delivery over telepractice service delivery or no preference. In college/university settings, respondents preferred in-person service delivery at 28.07% as compared to 1.28% who preferred telepractice service delivery (and 6.61% who showed no preference). In school settings, respondents preferred in-person service delivery at 38.35% as compared to 2.02% who preferred telepractice service delivery (and 2.57% who showed no preference). Additionally, participants across all settings primarily reported administering assessment and treatment via a traditional delivery model “Always” or “Most of the time”. In college/university settings, respondents reported administering assessment via a traditional in-person delivery model either “Always” or “Most of the time” at 17.43% and 9.91% respectively. In school settings, respondents reported administering assessment via a traditional delivery

Table 1
Demographics by Work Setting (N=545)

	College/university (n = 249)		School (n = 259)		Other* (n = 37)	
	%	n	%	n	%	n
Level of Education						
Masters	35.96	196	39.45	215	4.77	26
PhD	8.44	46	7.16	39	1.65	9
Other doctoral	1.10	6	0.55	3	0.37	2
Other	0.18	1	0.37	2	0.00	0
Geographical Regions**						
New England	1.83	10	2.75	15	0.37	2
Mid-Atlantic	5.50	30	4.40	24	1.83	10
East North Central	6.06	33	8.81	48	1.10	6
West North Central	5.32	29	6.61	36	0.73	4
South Atlantic	4.04	22	4.22	23	0.92	5
East South Central	2.75	15	3.30	18	0.18	1
West South Central	6.24	34	3.85	21	0.18	1
Mountain	5.50	30	5.32	29	0.55	3
Pacific	5.14	28	7.52	41	0.73	4
Other	3.12	17	0.55	3	0.18	1
No Response	0.18	1	0.18	1	0.00	0
Population Density						
Rural	8.07	44	8.81	48	1.10	6
Suburban	25.32	138	32.66	178	3.67	20
Urban	11.93	65	6.06	33	2.02	11
No response	0.37	2	0.00	0	0.00	0

*Other refers to individuals who work in hospitals, private practice, or another setting (excluding non-residential healthcare facilities, residential healthcare facilities, and home health).

** The geographical regions are delineated as follows: New England includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; Mid-Atlantic includes New Jersey, New York, and Pennsylvania; East North Central includes Illinois, Indiana, Michigan, Ohio, and Wisconsin; West North Central includes Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota; South Atlantic includes Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, District of Columbia, and West Virginia; East South Central includes Alabama, Kentucky, Mississippi, and Tennessee; West South Central includes Arkansas, Louisiana, Oklahoma, and Texas; Mountain includes Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming; Pacific includes Alaska, California, Hawaii, Oregon, and Washington (United States Bureau of the Census, 2010).

model “Always” or “Most of the time” at 30.46% and 6.79% respectively. In college/university settings, respondents reported providing treatment via a traditional in-person delivery model either “Always” or “Most of the time” at 11.56% and 12.11% respectively reported providing, and 15.96% and 16.33% within the school setting. When compared to telepractice service delivery, survey results indicate higher variability across responses, with many selecting “Always”, “Almost never”, or “Never” in regard to assessment and “Always”, “Sometimes” and “Almost never” for treatment. In college/university settings, 12.29% of respondents reported

administering assessment via telepractice service delivery model “Almost never”, and 8.44% reported “Always”. In school settings, 15.78% of respondents reported administering assessment via telepractice service delivery model “Almost never”, and 20.73% reported “Never”. Meanwhile, 12.48% of respondents within the college/university setting reported providing treatment via telepractice “Always” and 13.74% reported “About half the time” or “Sometimes”. Of those respondents within a school setting, 13.94% reported providing treatment via telepractice “Sometimes” and 14.50% reported “Almost never”.

Clinical Experience by Service Delivery Model

Populations treated across service delivery models are reported in Table 3. The most frequent responses for in-person assessment service delivery consisted of language disorders ($n=31$), articulation disorders ($n=29$), and phonological disorders ($n=25$). The most frequent responses for in-person treatment service delivery consisted of ASD ($n=31$), Augmentative and Alternative Communication (AAC, $n=27$), and apraxia of speech ($n=20$). For respondents who provided both assessment and treatment via in-person service delivery, the most frequent responses consisted of language disorders ($n=290$), articulation disorders ($n=271$), and phonological disorders ($n=229$). The most frequent responses for telepractice assessment service delivery consisted of articulation disorders ($n=11$), developmental disorders ($n=11$), and language disorders ($n=10$). The most frequent responses for telepractice treatment service delivery consisted of articulation disorders ($n=142$), language disorders (AAC, $n=141$), and ASD ($n=98$). For respondents who provided both assessment and treatment via telepractice service delivery, the most frequent responses consisted of language disorders ($n=151$), articulation disorders ($n=147$), and phonological disorders ($n=93$). In addition,

Table 2
Clinical Experience by Work Setting (N = 545)

	College/university (N = 249)		School (N = 259)		Other* (N = 37)	
	%	n	%	n	%	n
Primary Client Age Group						
0 to 3;0 years	1.65	9	0.18	1	0.92	5
3;1 to 5;0 years	6.97	38	8.26	45	1.47	8
5;1 to 12;0 years	16.88	92	32.48	177	1.28	7
12;1 to 18;0 years	0.73	4	6.61	36	0.55	3
18;1 to 65;0 years	14.86	81	0.00	0	1.65	9
65;1 years and up	4.22	23	0.00	0	0.92	5
No response	0.37	2	0.00	0	0.00	0
Preferred Service Delivery Model						
Traditional in-person service delivery	28.07	153	38.35	209	4.22	23
No preference	6.61	36	2.57	14	1.28	7
Telepractice service delivery	1.28	7	2.02	11	0.55	3
No response	9.72	53	4.59	25	0.73	4
Assessments Administered: Traditional In-person Service Delivery						
Always (81% to 100%)	17.43	95	30.46	166	2.20	12
Most of the time (61% to 80%)	9.91	54	6.79	37	1.65	9
About half the time (41% to 60%)	2.57	14	1.65	9	0.55	3
Sometimes (21% to 40%)	0.92	5	2.57	14	0.37	2
Almost never (1% to 20%)	4.04	22	2.02	11	0.55	3
Never (0%)	4.59	25	2.02	11	0.92	5
No response	6.24	34	2.02	11	0.55	3
Treatments Administered: Traditional In-person Service Delivery						
Always (81% to 100%)	11.56	63	15.96	87	2.20	12
Most of the time (61% to 80%)	12.11	66	16.33	89	1.47	8
About half the time (41% to 60%)	4.95	27	5.32	29	0.55	3
Sometimes (21% to 40%)	2.39	13	2.39	13	0.73	4
Almost never (1% to 20%)	3.12	17	3.49	19	0.55	3
Never (0%)	5.14	28	1.83	10	0.73	4
No response	6.42	35	2.20	12	0.55	3
Assessments Administered: Telepractice Service Delivery						
Always (81% to 100%)	8.44	46	2.57	14	0.92	5
Most of the time (61% to 80%)	2.57	14	0.73	4	0.00	0
About half the time (41% to 60%)	2.20	12	1.83	10	0.37	2
Sometimes (21% to 40%)	5.32	29	3.67	20	1.10	6
Almost never (1% to 20%)	12.29	67	15.78	86	2.20	12
Never (0%)	7.34	40	20.73	113	1.65	9
No response	7.52	41	2.20	12	0.55	3
Treatment Administered: Telepractice Service Delivery						
Always (81% to 100%)	12.48	68	6.24	34	1.83	10
Most of the time (61% to 80%)	2.75	15	2.75	15	1.10	6
About half the time (41% to 60%)	6.79	37	6.24	34	0.37	2
Sometimes (21% to 40%)	6.97	38	13.94	76	1.10	6
Almost never (1% to 20%)	4.95	27	14.50	79	1.28	7
Never (0%)	4.22	23	1.65	9	0.55	3
No response	7.52	41	2.20	12	0.55	3

*Other refers to individuals who work in hospitals, private practice, or another setting (excluding non-residential healthcare facilities, residential healthcare facilities, and home health).

respondents reported primary use of pen and paper data collection methods across service delivery models (traditional: 61.83% of respondents, telepractice: 50.09% of respondents).

Likert Scale Question Responses

Participants responded to a series of Likert scale questions related to the impact that COVID-19 has had on their experience with and perception of telepractice as a service delivery model. Table 4 shows these responses as they were provided on a scale of strongly disagree to strongly agree, which were later collapsed for ease of reporting to agree, disagree, or neither. In general, it appears that most clinicians have not experienced a change in their caseload since COVID-19 (39.63%), compared to 25.87% who have seen an increase in caseload, and 15.78% who have seen a decrease in their caseload. Further, 57.62% feel supported in their workplace regarding COVID-19.

Perhaps of most interest is that 55.05% of responding SLPs agreed that services delivered via telepractice can be as effective as in-person service delivery (in regard to client progress toward goals), 50.28% agreed that rapport between client and clinician can be built as effectively via telepractice as compared to in-person, and 50.28% disagreed with a statement indicating that assessments can be completed as accurately via telepractice as compared to in-person delivery models. When these results are compared to the Tucker (2012) study, the school-based SLPs represented in their study reported 24.1% of respondents either “strongly agreed” or “agreed” that services delivered via telepractice can be as effective as in-person service delivery (in regard to client progress toward goals, a 30.94% difference), 18.2% either “strongly agreed” or “agreed” that rapport between client and clinician can be built as effectively via telepractice as compared to in-person (a 32.08% difference), and 68.2% either “strongly disagreed” or “agreed”

with a statement indicating that assessments can be completed as accurately via telepractice as compared to in-person delivery models (a 17.91% difference).

Table 3
Clinical Experience by Service Delivery Model (N = 545)

	Traditional In-Person			Telepractice		
	Assessment	Treatment	Assessment and Treatment	Assessment	Treatment	Assessment and Treatment
What clinical population do you serve? (<i>n</i>)						
Accent Modification	3	5	30	1	2	19
Aphasia	5	4	59	2	19	41
Apraxia of speech	17	20	144	4	49	62
Articulation disorders	29	20	271	11	142	147
Auditory processing disorders	13	18	72	4	27	29
Augmentative alternative communication	10	27	141	3	57	34
Autism spectrum disorders	22	31	207	7	98	50
Bilingualism	7	3	34	1	8	10
Brain disorders (neurogenics)	10	2	59	2	9	30
Cognitive communication disorders	13	10	134	7	44	60
Developmental disorders	18	18	196	11	73	66
Early intervention (feeding)	2	1	19	0	3	4
Early intervention (vocal development)	5	4	56	2	14	16
Fluency	22	19	163	5	60	62
Language disorders	31	20	290	10	141	151
Laryngectomy	2	1	12	0	1	2
Learning disabilities	12	13	114	4	42	33
Literacy	12	12	94	4	37	44
Oral myofunctional disorders	5	0	30	0	6	8
Phonological disorders	25	17	229	6	89	93
Prevention and wellness	1	5	19	3	8	8
Public Speaking	1	2	8	1	3	6
Traditional In-Person (<i>N</i> = 545)			Telepractice (<i>N</i> = 545)			
	%	<i>n</i>	%	<i>n</i>		
What is your primary method of data collection?						
Pen and paper forms	61.83	337	50.09	273		
Google forms/sheets/other cloud-based methods	7.89	43	14.31	78		
Electronic medical/health records	11.56	63	12.29	67		
Data storage function of treatment application	1.83	10	2.75	15		
Other	0.92	5	2.39	13		
No response	15.96	87	18.17	99		

Also of note is that 28.62% of respondents indicated prior interest to providing services via telepractice (pre-COVID-19), while 53.94% of respondents indicated current interest in providing services via telepractice (now, during COVID-19), a difference of 25.32%.

In the current study, when asked if they were interested in providing services via telepractice now, during COVID-19, 53.94% of respondents agreed (26.24% of whom were based in school settings, similar to the respondents of the Tucker (2012) study). However, in the Tucker (2012) study, only 31.2% of respondents (a difference of 22.74%) indicated interest in providing services via telepractice in the school setting, and 31.7% indicated that they would be interested in providing services via telepractice in a different clinical setting (a question not included in the current study). Furthermore, 62.02% of respondents of the current study indicated they were interested in receiving continuing education related to best practices in telepractice service delivery (this question was not asked in Tucker, 2012), and 65.32% agreed that state licensure laws should allow for reciprocity between states for telepractice service delivery. In comparing this to the Tucker (2012) study, 71.2% either “strongly agreed” or “agreed” that state licensure laws should allow for reciprocity between states for telepractice service delivery (a difference of 5.88%). Most respondents of the current study (58.35%) agreed that there should be procedures outlined to follow in the event that there are technology failures when implementing telepractice as a service delivery model, as compared to the Tucker (2012) study, in which 91.2% of respondents indicated that their either “strongly agreed” or “agreed” with the statement (a difference of 32.85%). In addition, it is of note that most respondents of the current study agreed that a different set of materials is required to deliver services via telepractice than to deliver in-person services (68.44%, as compared to 58.2% of respondents of the Tucker, 2012 study, a difference of 10.24%). However, it was not clarified that this did not include assumed

Table 4

Responses to Likert Scale Questions Related to Impact of COVID-19 on Practice and Perceptions (N = 545)

Statement	Agree		Disagree		Neither		No Response	
	n	%	n	%	n	%	n	%
Impact of COVID-19								
My caseload has increased since COVID-19 and it feels unmanageable.	80	14.68	233	42.75	121	22.20	111	20.37
My caseload has increased since COVID-19 and it feels manageable.	61	11.19	215	39.45	159	29.17	110	20.18
My caseload has stayed the same since COVID-19.	216	39.63	129	23.67	86	15.78	114	20.92
My caseload has decreased since COVID-19 and it feels unmanageable.	21	3.85	296	54.31	115	21.10	113	20.73
My caseload has decreased since COVID-19 and it feels manageable.	65	11.93	237	43.49	131	24.04	112	20.55
I feel supported by those in my workplace regarding work-related changes brought on by COVID-19.	314	57.61	78	14.31	45	8.26	108	19.82
I was interested in providing telepractice prior to COVID-19.	156	28.62	230	42.20	47	8.62	112	20.55
I am interested in providing telepractice now, during COVID-19.	294	53.94	82	15.05	56	10.28	113	20.73
Perceptions of Telepractice								
*Assessments can be completed as accurately via telepractice as via in-person service delivery.	109	20.00	274	50.28	55	10.09	107	19.63
*A different set of materials is required to deliver speech and language telepractice services than to deliver in-person services.	373	68.44	35	6.42	28	5.14	109	20.00
*Rapport between SLP and client can be established during telepractice as effectively as during in-person service <u>delivery</u> .	274	50.28	117	21.47	45	8.26	109	20.00
*Speech and language telepractice services can be as effective, in terms of client progress toward goals, as in-person service <u>delivery</u> .	300	55.05	78	14.31	55	10.09	112	20.55
*Licensure laws should allow for reciprocity between states for speech and language telepractice service delivery.	356	65.32	18	3.30	60	11.01	111	20.37
*Minimum technology standards should be included in speech and language telepractice guidelines.	317	58.17	35	6.42	81	14.86	112	20.55
*Procedures to follow in the presence of technology failures should be included in speech and language telepractice guidelines.	318	58.35	26	4.77	87	15.96	114	20.92
*Client selection criteria should be included in speech and language telepractice guidelines.	304	55.78	38	6.97	89	16.33	114	20.92
*It is important to meet a client in person at some point during a speech and language telepractice program.	186	34.13	122	22.39	126	23.12	111	20.37
I am interested in receiving continuing education related to best practices in telepractice service delivery.	338	62.02	32	5.87	63	11.56	112	20.55

* Question adapted from Tucker, 2012.

technological requirements of providing telepractice services, which may have impacted the results.

While in the Tucker (2012) survey respondents generally reported agreement with most statements, the areas of greatest disagreement reported were related to telepractice and establishing rapport, administering assessment, and effectiveness when compared to in-person service delivery. Within the current study, the areas with the greatest disagreement reported were related to caseload since COVID-19, and the importance of meeting clients at some point during a treatment program (if primarily treated via telepractice).

Reasons to Not Use Telepractice

At the end of the survey, respondents were asked to select their primary concern for not using telepractice. Responses are shown in Table 5. Across all settings (college/university, school, or other), clinicians primarily indicated that their clients were not appropriate for telepractice, that telepractice is not supported in their work environment, or that telepractice is not an efficient or effective service delivery method. However, the majority of respondents indicated that they had “nothing” holding them back from using telepractice (41.1%).

Table 5
Primary Reasons for NOT Using Telepractice as a Service Delivery Model by Work Setting (N = 545)

	College/university (N = 249)		School (N = 259)		Other* (N = 37)	
	%	n	%	n	%	n
Nothing	20.37	111	17.61	96	3.12	17
Technological operation concerns	1.65	9	1.47	8	0.37	2
Limited access to technology	0.18	1	0.55	3	0.37	2
Clients are not appropriate	6.24	34	12.29	67	0.92	5
Not supported in work environment	0.18	1	2.75	15	0.37	2
Not an efficient/effective method	1.10	6	2.75	15	0.18	1
Slow internet speed	0.55	3	0.73	4	0.00	0
Fear related to inexperience	0.18	1	0.92	5	0.18	1
Financial reasons	0.18	1	0.00	0	0.00	0
I am too old to try something new	0.00	0	0.00	0	0.00	0
Overall disinterest	0.55	3	0.73	4	0.18	1
Other	1.65	9	2.39	13	0.37	2
No response	12.84	70	5.32	29	0.73	4

*Other refers to individuals who work in hospitals, private practice, or another setting (excluding non-residential healthcare facilities, residential healthcare facilities, and home health).

Comparison with Tucker, 2012

When comparing responses from the current study to those found in the original Tucker (2012) study, there are some interesting trends identified. Caution should be taken when comparing these studies due to the differences in the sample sizes, questions posed, and demographics of participants. Agreement with the following statements was seen in both the present respondents and those from Tucker, 2012: (1) assessments cannot be completed as accurately via telepractice as in-person delivery models, (2) different materials are required to provide services via telepractice, (3) licensure laws should allow for reciprocity between states for telepractice, (4) minimum technology standards should be included in speech and language telepractice guidelines, (5) procedures to follow in case of technological failures should be provided in telepractice guidelines, (6) client selection criteria should be included in speech and language telepractice guidelines, and (7) positive interest in receiving continuing education regarding telepractice. Disagreement between the respondents of the current study and those in Tucker, 2012 was seen in the following statements: (1) Speech and language telepractice services can be as effective, in terms of client progress toward goals, as in-person service delivery, (2) Rapport between SLP and client can be established during telepractice as effectively as during in-person service delivery, (3) It is important to meet a client in person at some point during a speech and language telepractice program. In these instances, respondents from Tucker (2012) generally disagreed, while the present respondents generally agreed.

Chapter V: Discussion

The purpose of this study was to gather information regarding the clinician perspective of telepractice service delivery when compared to traditional in-person service delivery. In particular, how these perceptions differ following the COVID-19 pandemic as compared to a study conducted by Tucker (2012). In addition, we aimed to understand the clinician's confidence level regarding the use of telepractice as a service delivery method. Our hypothesis was that there would be observable differences between SLP's perceptions of telepractice pre- and post-COVID-19. With this information, it is hoped that clinicians, clients, researchers, and others motivated by the use of evidence-based practice in the field of speech-language pathology (e.g., insurance companies, state programs, etc.) will have additional foundational information for the implementation of telepractice delivery models; that providers can more confidently declare support or discourage use of telepractice.

Demographics

Overall, most respondents held a master's degree as compared to a PhD or other doctoral degree. The geographical locations of SLPs in college/university versus school settings were also very similar. There was a greater percentage of SLPs in the college/university setting who responded from Mid-Atlantic, West South Central, Mountain, and other (combination of regions) as compared to those in the school setting. With respect to population density in the area surrounding work settings, there were more SLPs in the school setting who responded from rural and suburban areas, and more SLPs in the college/university setting who responded from urban areas.

Clinical Experience by Work Setting

Participants within the school setting reported working with a higher percentage of clients in the 3;1-12;0 age ranges, as compared to those within a college/university setting who reported

mostly working with those between the ages of 5;1-12;0 and 18;1-65;0. Overall the average age reported for clients on caseloads was analogous to that reported in the study conducted by Aggarwal et al. (2020), wherein most participants had pediatric caseloads. Regardless of setting, SLPs reported a preference for in-person service delivery over telepractice service delivery. Additionally, there was less variety in answers regarding frequency of services delivered within an in-person delivery model (“always” or “almost always” for assessment and treatment) as compared to services delivered via telepractice (answers ranged from “always” to “never”). This is likely related to the clinician’s perspective of telepractice, which will be further explored in the “Likert Scale Question” section.

About 79% of respondents reported currently providing services (assessment or treatment) via telepractice (those who reported “Always”, “Most of the Time”, “About Half the Time”, “Sometimes”, or “Almost Never”, and thus provide services via telepractice more than 0% of the time). This is an increase in reported provision via telepractice when compared to the study conducted by ASHA (2020), which showed 61% of respondents provided services via telepractice, and the study conducted by Mohan et al. (2017), which showed only 12.19% of respondents provided services via telepractice. The COVID-19 pandemic can explain both of these differences. Given that there was no pressing need to provide services via telepractice in 2017 (at the time of the Mohan et al. study), it is not surprising that we found more clinicians reporting use of these services now. Also, it is possible that as the COVID-19 pandemic has extended longer than many originally expected, more clinicians are adopting telepractice as a means to continue to provide services, accounting for the difference in percentages seen between our results and those from ASHA, 2020.

Clinical Experience by Service Delivery Method

The populations assessed and treated by respondents were varied, with the most common populations served across service delivery models being those with articulation disorder, language disorder, phonological disorder, ASD, AAC, apraxia of speech, and developmental disorder. This is likely representative of the average college/university and school setting SLP caseloads across the nation given the large sample size of the current study. Further, across service delivery methods, pen and paper data collection methods were the most common.

Likert Scale Questions

For ease of reporting, responses to the Likert portion of the survey were collapsed from a five-point scale ranging from “Strongly Disagree” to “Strongly Agree” to a three-point scale including “Agree”, “Disagree”, and “Neutral”.

Overall, respondents had not experienced growth or loss to their caseload size since COVID-19 and have felt supported within the workplace regarding COVID-19. An increased interest in providing telepractice can be seen as indicated by a difference of 25.32% when clinicians were asked about their interest in providing services pre-COVID-19 and post-COVID-19. Reasons regarding this change were not queried, so a conclusion cannot be drawn. When compared to Tucker (2012), more respondents of the current study (55.05%) agree with a statement indicating that services provided via telepractice are as effective (in regard to client progress toward goals) as in-person delivery models (24.1% Tucker, 2012), a 30.94% difference. More respondents of the current study reported that telepractice is an effective service delivery model and that rapport can effectively be built via telepractice, and fewer disagree with a statement indicating that assessment can be conducted via telepractice, as compared to respondents to the Tucker (2012) study.

The questions regarding current interest in participating in telepractice are difficult to compare across the studies, primarily because of a slight difference in wording between questions. The question posed by Tucker (2012) tapped into respondent interest in providing telepractice outside of the school setting, while the current study tapped into respondent interest in providing telepractice now, during COVID-19. Although there is an increase in number of respondents interested in providing telepractice seen in the current study (a difference of 22.74%), direct conclusions cannot be drawn.

There was a minimal difference across studies when asked if state licensure should allow for reciprocity between states (a difference of 5.88%). This demonstrates continued interest in and support of state licensure reciprocity.

More respondents of the Tucker (2012) study than our study agreed with the needed creation of guidelines to follow in the event of technological failures (a difference of 32.85% between studies). While this difference between studies is noted, we can only speculate as to the cause of the difference. Perhaps, the increased provision of telepractice as a service delivery model by respondents in our study (as compared to only 10 respondents of 170 in Tucker, 2012) provides a simple explanation. Confidence in provision of telepractice grows with experience implementing telepractice, and therefore, fewer guidelines are perceived as needed.

A question not posed by Tucker (2012) was focused on respondent interest in receiving continuing education regarding telepractice. The majority of the respondents in the present study indicated interest in obtaining continuing education on telepractice, which demonstrates to creators of continuing education that there is a market for this type of content in the courses.

Reasons for the differences seen between the studies cannot be concluded explicitly from the current study. This is due to the lack of qualitative responses from respondents on the

rationale for perspectives related to each Likert question. However, this issue should be explored in future research.

Reasons to Not Use Telepractice

Overall, rationale surrounding respondent's preference to use, or not use, telepractice were explored in the question "What is the primary thing that keeps you from using telepractice as a service delivery model?". While most respondents indicated that "nothing" kept them from using telepractice (41.1%), this question did provide a general insight into the motivations of the responding SLPs. Respondents reported not providing telepractice services most frequently because their clients were not appropriate for telepractice, telepractice was not supported in their work environment, or telepractice was not an efficient or effective service delivery method. Tucker (2012) observed that most respondents remained "reticent" or in opposition to the adoption of telepractice, "offering neutral or negative attitudes" (p. 69). There appears to have been a shift to a more neutral opinion toward telepractice given the results of our study, as indicated by more respondents describing "nothing" holds them back from using telepractice. In Tucker (2012), a response of this type was not reported. Instead, in Tucker (2012) respondents indicated concern with use of telepractice for administering assessments and treatment, and for establishing rapport with their clients. Respondents from Mohan et al. (2017) were also different from ours, having indicated concern with use of telepractice resulting from insufficient knowledge regarding the service delivery model, difficulty with/limited availability of technical infrastructure, the need for formal training and certification, and the reduced security and privacy of their clients (i.e., need for private software domains and legal guidelines and policies).

Chapter VI: Limitations and Future Directions

The purpose of this study was to understand how clinician perspectives toward and confidence with telepractice may have been impacted by the onset of COVID-19, and how respondents would compare to those from Tucker (2012). We hypothesized that there would be observable differences between SLP's perceptions of telepractice pre- and post-COVID-19. Upon review of obtained data, we realized there were actually few questions that directly addressed SLP confidence with and feelings toward telepractice before and after the onset of COVID-19. This limitation could be alleviated with the inclusion of qualitative questions following each of the Likert questions. Such questions may be "How does this impact your interest in providing services via telepractice" or "Does this impact your confidence level in providing services via telepractice? If so, how". Additionally, in an effort to reduce the number of total questions in the survey, researchers could include questions following the Likert portion of the survey inquiring which of the discussed statements impact respondent interest in or confidence with provision of telepractice, and to describe why. There was one question addressing overall interest (which indicated increased interest pre- and post-COVID-19), however, this question did not provide sufficient information to draw concrete correlations between responses to the Likert portion of the survey. Due to this, the construct validity (i.e., the appropriateness of conclusions made on the basis of responses obtained) of the survey was negatively affected. Inclusion of the above-mentioned survey questions would improve construct validity. Because aspects of the stated aims of this study were not met (specifically, aim 2: clinician's sense of confidence providing services via telepractice as compared to in-person service delivery), it cannot be asserted that this survey completed the task initially intended.

It is important to note that the results of the current study may be skewed given the environments in which the majority of the respondents reported working (college/university or

school settings). This is due to the nature by which email addresses were acquired for this study. Email addresses that were made publicly available via college and university websites were gathered and organized by state. Following this, an equal number of publicly available email addresses were gathered, many of which coincided with public school districts. A more diverse sample size would have been appropriate. As a way to mitigate this imbalance in the future, researchers could buy email addresses directly from ASHA or used public social media websites, such as Facebook, to gather email addresses from willing participants.

In addition, the wording of some of the Likert scale questions may have been misleading or confusing (primarily the question regarding materials required for telepractice), which would have influenced the responses provided by respondents. A question regarding a shift in opinions due to required restrictions following COVID-19 (e.g., such as: “Have your opinions related to provision of telepractice changed in the past year due to restrictions to tradition in-person services brought on by the onset of COVID-19? If so, how?” or “If you reported a change in perspective of telepractice post-COVID-19, please describe what contributed to that change?”) was not posed. Had this been included, it may have provided additional insight into the perspectives of the responding clinicians. Another limitation is that across each of the Likert scale questions about 20% of total participants provided no response. As a way to mitigate this limitation, it may have been beneficial to place the Likert questions earlier in the survey in an attempt to bypass respondent fatigue. Additionally, the length of the survey was impacted by the inclusion of survey questions related to another thesis project relevant to telepractice (Resare, 2021). The survey could have been shortened, including fewer questions, to increase the likelihood of full completion by all respondents.

Chapter VII: Clinical Implications/Conclusions

These results will have an important impact on the provision of telepractice in the field of speech-language pathology. Although telepractice as a service delivery model is embraced by many, not all clinicians are convinced of its efficacy. Further research should explore the reasons behind the hesitation expressed by clinicians to adopt telepractice as a service delivery model. Results from this study will contribute to the evidence-based foundation from which SLPs are encouraged to build their practice.

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Appendix

The Speech-language Pathologist's Perspective on Telepractice Since COVID-19

As part of a graduate research project, my thesis adviser, Heather L. Ramsdell, PhD CCC-SLP, and I, Maesa Chaffin, are conducting a survey to explore the changes in clinician perspectives regarding the effectiveness of telepractice (defined as: the use of video conferencing technology and all other associated technologies to provide and participate in speech language services) versus in-person service delivery models pre- and post-COVID-19. Ultimately, we hope to better understand the clinician experience and the factors contributing to these perspectives and improve client outcomes. Approval for the study has been obtained by the Human Subjects Committee at Idaho State University.

This survey is being distributed to speech-language pathologists with publicly available email addresses across the United States. It is brief and will take you no more than 10 minutes to complete. Your response is voluntary and any information you provide will remain anonymous. Your completion of this survey would be greatly appreciated and would help to advance the field by enabling our team to find out more about the SLP experience in telepractice. We thank you for your time and consideration!

Please respond to all questions by selecting the appropriate option based on your current work setting. We will send two reminder emails to those who have not yet completed the survey, and responses are needed by xxx.

1. Are you a member of the American Speech-Language Hearing Association (ASHA)?
 - a. Yes
 - b. No
2. What is your current certification status?
 - a. None
 - b. Clinical fellow (CF)
 - c. Certified Speech-Language Pathologist (CCC-SLP)
 - d. Certified Audiologist (CCC-A)
 - e. Dual certified (CCC-SLP and CCC-A)
 - f. Only state licensed
 - g. Other _____
3. What is the highest level of education you have received?
 - a. Associate's degree
 - b. Bachelor's degree
 - c. Master's degree
 - d. Doctor of philosophy
 - e. Other doctoral degree (e.g., of Medicine, Audiology, Speech-Language Pathology, Education, etc.)
 - f. Other

4. How old are you?

5. In what/which state(s) do you practice?

Alabama	Idaho	Minnesota	North Dakota	Vermont
Alaska	Illinois	Mississippi	Ohio	Virginia
Arizona	Indiana	Missouri	Oklahoma	Washington
Arkansas	Iowa	Montana	Oregon	West Virginia
California	Kansas	Nebraska	Pennsylvania	Wisconsin
Colorado	Kentucky	Nevada	Rhode Island	Wyoming
Connecticut	Louisiana	New Hampshire	South Carolina	Washington DC
Delaware	Maine	New Jersey	South Dakota	Other
Florida	Maryland	New Mexico	Tennessee	
Georgia	Massachusetts	New York	Texas	
Hawaii	Michigan	North Carolina	Utah	

6. What is the primary setting where you work?
 - a. College/university
 - b. Hospital
 - c. Non-residential health care facility
 - d. Private practice
 - e. Residential health care facility
 - f. School

g. Other

7. What is the primary age group that you work with?

- a. 0-3;0 years
- b. 3;1-5;0 years
- c. 5;1-12;0 years
- d. 12;1-18;0 years
- e. 18;1-65;0 years
- f. 65;1 years +

8. How would you classify the primary area where you practice speech-language pathology?

- a. Rural
- b. Suburban (largely populated by single-family homes)
- c. Urban (a denser city-like environment)

Traditionally, most clinical speech-language pathology services are provided using face-to-face methods (which includes the client and a clinician participating in evaluation and/or treatment activities while physically sharing the same space).

9. How often do you provide clinical speech-language pathology **assessments** via the traditional face-to-face service delivery model?

- a. Always (81% to 100% of the time)
- b. Most of the time (61% to 80% of the time)
- c. About half the time (41% to 60% of the time)
- d. Sometimes (21% to 40% of the time)
- e. Almost never (1% to 20% of the time)
- f. Never (0% of the time)

If yes, how long have you provided clinical speech-language pathology **assessments** via the traditional face-to-face service delivery model?

10. How often do you provide clinical speech-language pathology **treatment** via the traditional face-to-face service delivery model?

- a. Always (81% to 100% of the time)
- b. Most of the time (61% to 80% of the time)
- c. About half the time (41% to 60% of the time)
- d. Sometimes (21% to 40% of the time)
- e. Almost never (1% to 20% of the time)
- f. Never (0% of the time)

If yes, how long have you provided clinical speech-language pathology **treatment** via the traditional face-to-face service delivery model?

The spread of COVID-19 has initiated a spike in service providers utilizing telepractice delivery models (including the use of videoconferencing technologies to provide speech-language pathology services at a distance).

11. How often do you provide clinical speech-language pathology **assessments** via a telepractice service delivery model?

- a. Always (81% to 100% of the time)
- b. Most of the time (61% to 80% of the time)
- c. About half the time (41% to 60% of the time)
- d. Sometimes (21% to 40% of the time)
- e. Almost never (1% to 20% of the time)
- f. Never (0% of the time)

If yes, how long have you provided clinical speech-language pathology **assessments** via a telepractice service delivery model?

12. How often do you provide clinical speech-language pathology **treatment** via a telepractice service delivery model?

- a. Always (81% to 100% of the time)
- b. Most of the time (61% to 80% of the time)
- c. About half the time (41% to 60% of the time)
- d. Sometimes (21% to 40% of the time)
- e. Almost never (1% to 20% of the time)
- f. Never (0% of the time)

If yes, how long have you provided clinical speech-language pathology **treatment** via a telepractice service delivery model?

13. With what population do you administer assessment/treatment procedures? (Choose the three most frequently encountered for each mode of service delivery)

Client Diagnoses	Assessment	Treatment
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	In-person	Telepractice	In-person	Telepractice
a. Accent modification				
b. Aphasia				
c. Apraxia of speech				
d. Articulation disorder				
e. Auditory processing disorder				
f. Augmentative and alternative communication				
g. Autism				
h. Bilingualism				
i. Brain disorders (neurogenic)				
j. Cognitive communication disorders				
k. Developmental disorders				
l. Early intervention – infant feeding				
m. Early intervention – prelinguistic vocal development				
n. Fluency				
o. Language disorders				
p. Laryngectomy				
q. Learning disabilities				
r. Literacy				
s. Oral myofunctional disorders				
t. Phonological disorders				
u. Prevention and wellness				
v. Public speaking				

14. What is your preferred speech-language pathology service delivery model for treatment and diagnosis?

- Strongly prefer the traditional face-to-face service delivery model
- Somewhat prefer the traditional face-to-face service delivery model
- No preference between traditional and teletherapy service delivery models
- Somewhat prefer teletherapy as a service delivery model
- Strongly prefer teletherapy as a service delivery model

15. What is your primary method for data collection for **in-person** service delivery?

- Pen and paper forms
- Google forms/sheets/other cloud-based methods
- Electronic medical/health records
- Data storage function of treatment applications
- Other

16. What is your primary method for data collection for **telepractice** service delivery?

- Pen and paper forms
- Google forms/sheets/other cloud-based methods
- Electronic medical/health records
- Data storage function of treatment applications
- Other

To what extent do you agree with the following statements?						
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
17. My caseload has increased since COVID-19 and it feels unmanageable.						
18. My caseload has increased since COVID-19 and it feels manageable.						
19. My caseload has stayed the same since COVID-19.						
20. My caseload has decreased since COVID-19 and it feels unmanageable.						
21. My caseload has decreased since COVID-19 and it feels manageable.						
22. I feel supported by those in my workplace regarding work-related changes brought on by COVID-19.						

23. Assessments can be completed as accurately via telepractice as via in-person service delivery.						
24. A different set of materials is required to deliver speech and language telepractice services than to deliver in-person services.						
25. Rapport between SLP and client can be established during telepractice as effectively as during in-person service delivery.						
26. Speech and language telepractice services can be as effective, in terms of client progress toward goals, as in-person service delivery.						
27. Licensure laws should allow for reciprocity between states for speech and language telepractice service delivery.						
28. Minimum technology standards should be included in speech and language telepractice guidelines.						
29. Procedures to follow in the presence of technology failures should be included in speech and language telepractice guidelines.						
30. Client selection criteria should be included in speech and language telepractice guidelines.						
31. It is important to meet a client in person at some point during a speech and language telepractice program.						
32. I was interested in providing telepractice prior to COVID-19.						
33. I am interested in providing telepractice now, during COVID-19.						
34. I am interested in receiving continuing education related to best practices in telepractice service delivery.						

35. What is the primary thing that keeps you from using telepractice as a service delivery model?

- Nothing keeps me from using telepractice as a service delivery model
- Technological operational concerns
- Limited access to technology
- Clients on caseload are not appropriate for telepractice
- Delivery method not supported in work environment
- Not an efficient/effective service delivery method
- Slow internet speed
- Fear (related to the use of technology)
- Financial reasons (e.g., cannot afford software)
- I am too old to try something new
- I am just not interested
- Other