American Journal on Intellectual and Developmental Disabilities

The Impact of Administration Formats on SIS-A Scores

--Manuscript Draft--

Manuscript Number:	AJIDD-D-21-00095R1
Article Type:	Research Report
Keywords:	Long-Term Services and Supports; Supports Intensity Scale; Mixed-Methods Research; Intellectual Disability; COVID-19
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Manuscript Region of Origin:	UNITED STATES
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Abstract

Many U.S. states use the Supports Intensity Scale - Adult Version (SIS-A; Thompson et al., 2015) to inform the distribution of public funds for long-term services and supports. Throughout the COVID-19 pandemic, many states began administering the SIS-A virtually instead of in-person. Because administration format has the potential to influence SIS-A scores and consequently impact the funding people receive for long-term services and supports, this study examined the stability of support need scores, as measured by the SIS-A, over two time periods: (a) when assessments were conducted in person and (b) when assessments were conducted virtually, using remote technology. Specifically, the influence of assessment administration formats on SIS-A scores and on the perceptions of SIS-A Assessors were investigated. Results revealed that the virtual administration format impacted SIS-A scores, but the impact was of little to no practical importance.

Keywords: Long-Term Services and Supports, Supports Intensity Scale, Mixed-Methods Research, Intellectual Disability, COVID-19

The Impact of Administration Formats on SIS-A Scores

Across the United States, many adults with intellectual and developmental disabilities (IDD) receive long-term services and supports (LTSS) to access the resources they need to engage in typical life activities in integrated community settings. State and local governments in all 50 states rely upon Home and Community-Based Services (HCBS) Waivers to underwrite the costs of LTSS (Thach et al., 2018). Even though all 50 states utilize HCBS Waivers, the funding available varies considerably across states. In most states, there are not enough funds to cover the costs of LTSS for all adults with IDD who qualify for HCBS Waivers. As a result, many adults with IDD face long wait times to receive services. As of 2017, over 473,000 people with IDD in 36 states were on waiting lists to receive HCBS Waiver funding (Musumeci et al., 2019).

Given the finite resources available to fund LTSS through HCBS Waivers, states must consider how to distribute funds equitably, maximizing the number of people who have access to the services and supports they need while also being responsive to the fact that people have differing types and intensities of needs (Thompson et al., 2018). To promote equity in resource allocation, many states use measures of support needs to inform decision-making, ranging in complexity from informal clinical judgments to fully validated, standardized assessment instruments. Regardless of measure, some type of assessment is needed by states to provide a non-arbitrary basis for determining relative need and funding (Thompson et al., 2017).

Supports Intensity Scale-Adult Version

Of the standardized support needs assessments published over the past 20 years, the Supports Intensity Scale-Adult Version (SIS-A; Thompson et al., 2015) is the best known and most widely used (Thompson & DeSpain, 2016). The SIS-A was designed to provide a psychometrically valid means of assessing the intensity of supports needed by adults with IDD

between the ages of 16 and 64. A structured interview is used to collect assessment information. Assessment results have been used for multiple purposes, including determining program eligibility, planning supports and services, and distributing public funds (Thompson et al., 2018).

COVID-19

Although there is strong research evidence showing that the SIS-A is a valid and reliable measure that produces stable scores over time (Thompson et al., 2015), all prior research was conducted using data collected in face-to-face (F2F) assessment. With the onset of the COVID-19 pandemic, conducting F2F assessments became dangerous to the health and safety of SIS-A assessors and respondents. As a result, many jurisdictions moved to conducting SIS-A assessments through virtual interviews using video-conferencing platforms or telephone calls. This change provided safety, but also introduced uncertainty regarding the accuracy of assessment results. Shifting administration formats of the SIS-A could have impacted scores, a particular concern given to the relationship between SIS-A assessessments and LTSS funding.

Purpose & Research Questions

Due to the need to alter the SIS-A's administration format because of the COVID-19 pandemic, it was essential to investigate the impact of administration format on SIS-A scores. The purpose of the study was to examine the influence of assessment administration formats (i.e., F2F versus virtual) on SIS-A scores and on the process of administering the measure. This study addressed the following research questions: (1) Does virtual administration of the SIS-A impact SIS-A scores? If so, what is the nature and extent of the impact?; and (2) What are the perspectives of SIS-A Assessors regarding the impact of administration formats on SIS-A scores and the SIS-A administration process?

Methods

To answer these research questions, we implemented a convergent mixed-methods research study, collecting both quantitative and qualitative data. We merged the quantitative results and qualitative findings to obtain understanding of the problem from multiple angles and perspectives (Creswell, 2015). Quantitative data provided definitive evidence of how administration formats impacted SIS-A scores (i.e., the assessment outcome). Qualitative data provided insight into the impact of administration formats on the assessment process. Institutional review board approval was obtained prior to collecting qualitative data and prior to accessing quantitative data.

Quantitative Study

To evaluate the impact of the virtual administration format, we conducted multiple quantitative analyses utilizing a de-identified dataset of SIS-A assessments. Data were collected by SIS-A Assessors and entered into SISOnline, a data repository maintained by AAIDD. AAIDD provided access to data used for answering research question one.

Sample

The dataset included records for 6,615 adults with IDD who had been determined eligible for LTSS funded by HCBS Waivers. Over half of the records (n = 3,753; 56.7%) were collected F2F in April and May of 2019 when in-person interviews were required. The remaining 2,862 records (43.3%) were collected from virtual administrations of the SIS-A in April and May of 2020 in U.S. states where it was verified that the SIS-A was administered virtually. Individuals who participated in F2F administrations were on average 40.3 years old (SD = 16.02); those who participated in virtual administrations were 39.57 years old (SD = 16.08). Participation in F2F administration or virtual administration was a function of when jurisdictions scheduled SIS-A

assessments and what format was being used at that time. Data from in-person and virtual assessments came from the same nine, geographically diverse U.S. states.

Measure

As a part of each state's LTSS budget development process, all respondents were assessed using the SIS-A (Thompson et al., 2015) with assessment information gathered through a structured interview process. Assessments were conducted by a trained professional, referred to as a SIS-A Assessor, and included at least two respondents who knew the person being assessed well. The SIS-A consists of three sections. Section One, a non-standardized portion of the scale, includes 32 items that measure a person's support needs related to medical conditions and/or behavioral concerns. Section Two, the standardized portion of the scale, includes 49 items across six subscales. Each item describes a common life activity, and people are assessed in regards to the intensity of support required to fully participate in that life activity. Items are rated on a five-point scale against three support dimensions (i.e., time, frequency, and type). Assessment results from Section Two generate standard scores for each subscale as well as a composite standard score that reflects a person's overall intensity of support needs. Section Three includes eight items measuring self-advocacy, civic engagement, and self-determination. Items in Section Three are structured and scored in the same way as items in Section 2; however, no standard scores are produced from Section Three.

Data Analysis

To answer research question one, we applied multi-group measurement invariance testing to determine if responses were similar across groups. Specifically, in a step-wise process, configural, weak, and strong models are evaluated to judge invariance in structure, factor loadings, and indicator intercepts, respectively. To examine multi-group measurement invariance

for support needs, we created a model with a support needs factor using raw subscale scores from Section Two for Home Living, Community Living, Employment, Lifelong Learning, Social, Health and Safety as indicators. The fixed-factor method of identification, in which the latent variances of the construct are fixed to one, was used for scale identification. In the configural model to compare structure in the first step, we examined model fit using the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean squared error of approximation (RMSEA). Models with good fit have CFIs and TLIs closer to one (Raykov & Marcoulides, 2006). The RMSEA measures lack of fit, with lower values closer to zero indicating a good fitting model. Because we used a one-factor model with small residuals, we did not expect the models would exhibit acceptable fit using RMSEA statistics (Kenny et al., 2015). If the model fit was acceptable with equal structure, the second step estimated the weak model with equal factor loadings. We focused on overall change in model fit statistics from the configural model to the weak model with minimal change in CFI (< .01; Cheung & Rensvold, 2002). In the third step the indicator intercepts (means of the individual items) were equated to test strong invariance. Strong model fit statistics were then compared to the weak model fit statistics using the same criteria that was used to compare the weak to the configural model. Establishing multi-group measurement invariance would indicate that the SIS-A was invariant across groups, allowing for the examination of latent scores across groups. To examine latent differences, we used the Satorra-Bentler scaled chi-square test (Satorra & Bentler, 2010) to compare models. Mplus 7.3 (Muthén & Muthén, 2015) with robust maximum likelihood estimation (MLR) was used for all analyses.

Qualitative Study

Participants

Focus group participants included 21 SIS-A Assessors with experience administering the SIS-A in both F2F settings and virtually using video-conferencing technology. Participants administered the SIS-A across diverse geographical regions of the U.S. Every participant identified as female. Seventeen participants were Caucasian, while four were other ethnicities, including African American (n = 3) and two or more ethnicities (n = 1). All participants held either bachelor's degrees or master's degrees in disciplines associated with the field of intellectual and developmental disabilities (IDD), including social work, special education, and rehabilitation counseling. Participants had been administering the SIS-A for varying lengths of time, ranging from one to fifteen years. The majority of participants received their original SIS-A certification from AAIDD (n = 11) or state disability organizations (n = 4). Eighteen participants received training addressing virtual SIS-A administration at the onset of the COVID-19 pandemic. Most participants (n = 16) had never administered the SIS-A virtually prior to the COVID-19 pandemic. Participants used a variety of platforms to facilitate virtual administrations, including Zoom (n = 19), Microsoft Teams (n = 4), and Webex (n = 1).

Recruitment

Purposive sampling was used to recruit SIS-A Assessors to participate in focus groups. We requested recommendations of potential SIS-A Assessors from the AAIDD Director responsible for overseeing SIS Programs. The AAIDD Director connected us with administrators from organizations responsible for administering the SIS-A, and we provided an explanation of the study as well as an overview of participant responsibilities and relevant timelines. We requested that they share recruitment materials with SIS-A Assessors within their organizations, and interested SIS-A Assessors were instructed to follow up via email with the lead author to express their willingness to participate. Upon hearing from interested SIS-A Assessors, we

shared consent forms and scheduled their participation in a focus group. All SIS-A Assessors who expressed interest and met the study's inclusion criteria participated in the focus groups. Of the 25 SIS-A Assessors invited, 21 participated.

Focus Group Procedures

To understand the impact of the virtual format on the SIS-A administration process, we conducted focus groups with SIS-A Assessors. To ensure that each focus group covered the study's intended topics, we developed open-ended semi-structured questions to capture participants' perspectives (Rubin & Rubin, 2005). Questions addressed the advantages and disadvantages of virtual administration; impact on rapport, timing, and information gathered; strategies for virtual administration; and future use of virtual administration. We also developed interview probes for each semi-structured interview question. Interview probes were used when participants provided short responses or "non-answers" and when it was clear that the respondent had not understood the question. Focus groups were conducted using Zoom, an online video-conferencing platform. Five focus groups were carried out with three to six SIS-A Assessors each, a number of participants conforming with the field's current recommendations (Harrell & Bradley, 2009).

Data Handling & Analysis

We relied upon qualitative methods associated with grounded theory to guide data analysis (Charmaz, 2009). Two researchers, one with extensive SIS-A research experience and one with SIS-A practitioner experience, supported analysis efforts. To analyze focus group transcriptions and construct relevant themes, we utilized a three-step process: (a) prepare data; (b) explore data; and (c) reduce data (Bazeley, 2013). During the "prepare data" step, we had each digitally recorded focus group transcribed by an independent organization, and we reviewed

each transcription to ensure accuracy. After review, we uploaded documents into Dedoose (8.1.21), a qualitative analysis software. During the "explore data" step, we actively engaged with the data. We used inductive open coding to identify intial codes. During this stage, we also wrote research memos. Memos included reflections regarding the collected data. During the "reduce data" step, we reviewed transcriptions using axial coding to combine related codes and construct final code names and definitions (Corbin & Strauss, 2008). Throughout each stage of coding, we made decisions through consensus. For any disagreement, we shared our rationale for coding and/or critique of coding decisions until an agreement was reached.

Results

Quantitative Findings

Research question one asked: "Does virtual administration of the SIS-A impact SIS-A scores? If so, what is the nature and extent of the impact?" To answer this question, SIS-A scores were evaluated for multi-group measurement invariance at the support need domain level using raw scores. When considering comparative fit statistics, model fit at the configural level was acceptable (*CFI* = 0.95, *TLI* = 0.92). Similarly, model fit at the weak level was also acceptable when considering comparative fit statistics (*CFI* = 0.95, *TLI* = 0.94). Overall change in model fit from the configural level to the weak level was acceptable (ΔCFI = 0.000), indicating factor loadings could be equated across administration formats. Finally, the estimation of the strong model appeared to fit equally as well (*CFI* = 0.92, *TLI* = 0.95). Change in model fit from the weak level to the strong level was also acceptable (ΔCFI = 0.003), indicating indicator intercepts could be equated across administration formats. As expected, RMSEA values were larger than typically acceptable (>.08), but improved in each invariance step as degrees of freedom increased (Kenny et al., 2015). We were able to establish measurement invariance at the

configural, weak, and strong levels with this sample. These results confirmed that group comparisons across administration formats could be conducted. Model fit information for the null model and each level of invariance testing are reported in Table 1.

Once the model for this sample was judged to be invariant for the strong model, we progressed to testing invariance of the latent means. Doing so enabled examination of mean level changes in the constructs across the two measurement occasions. A model constraining the latent means across measurement occasions was estimated and compared to the strong invariant model. The model constraint decreased model fit ($\Delta\chi^2$ = 23.34, df = 1, p < .001) indicating the latent means could not be equated, and neither could the latent variance ($\Delta\chi^2$ = 18.24, df = 1, p < .001). In our final model, we added age, the only demographic variable included in the de-identified dataset, as a covariate in the model. With support needs regressed on age, only 0.5% (β = 0.004, SE = 0.001) of variance was explained in support needs for F2F assessments and only 0.8% (β = 0.005, Se = 0.001) of the variance was explained in support needs for virtual assessments.

To understand the meaning of this statistical difference, we considered differences in mean scores. Results indicated that SIS-A raw scores estimated by the support needs factor were around ten points higher when the measure was administered using the virtual format (M = 346.126, SD = 74.31) than when it was administered using the F2F format (M = 336.421, SD = 82.41). This difference translated to a 1 point difference in the standardized support needs index and latent *d* = 0.11, a small effect (Cohen, 1992).

Qualitative Findings

Research question two asked: "What are the perspectives of SIS–A Assessors regarding the impact of administration formats on SIS–A scores and the SIS–A administration process?" To answer this question, we conducted focus groups with SIS–A Assessors experienced in using

both F2F and virtual administration formats. Through analyses, researchers constructed a total of thirty-five codes, further condensed into five themes, which are discussed below and illustrated with supportive quotes in Table 2.

Impact of Virtual Administration on SIS-A Scores

One objective of focus groups was to understand SIS-A Assessors' perspectives regarding product outcomes of SIS-A assessments administered virtually. Semi-structured interview questions addressed focus group participants' perspectives regarding the validity and reliability of SIS-A scores generated using the virtual administration format. Despite using a new administration format, participants felt that generated SIS-A scores were valid and reliable. More to the point, participants did not perceive the SIS-A scores of people who were assessed virtually would have been different had the assessment been conducted in person.

Impact of the Virtual Format on the SIS-A Administration Process

Another aim of focus groups was to understand the impact of the virtual format on the process of administering the SIS-A. To understand this, semi-structured interview questions addressed topics such as the impact of the virtual format on timing and information gathered. Across all focus groups, SIS-A Assessors reflected on advantages and disadvantages and the impact of the virtual administration format on the length of the assessment process.

Advantages and Disadvantages. All focus group participants identified numerous advantages of the virtual administration format. One commonly cited advantage related to increased flexibility. Focus group participants noted that virtual administration allowed meetings to be scheduled when high-quality respondents were available, to be split into multiple sessions, and to be rescheduled at the last minute. Another frequently mentioned advantage of the virtual format was increased accessibility for SIS-A respondents. Focus group participants indicated that

the virtual administration format reduced the demands placed on family respondents, minimizing transitions and unknowns. The increased flexibility and accessibility of the virtual format ultimately led to increased participation by family members and professionals.

Focus group participants also identified disadvantages to using the virtual format. One commonly cited disadvantage related to group interview facilitation challenges. Focus group participants attributed group interview facilitation challenges to distractions, including environmental distractions (i.e., a ringing doorbell or family pets) and competing work responsibilities (i.e., emails). Focus group participants also connected group facilitation challenges to a loss of effective strategies, noting that strategies commonly used in F2F settings were not always available or effective in the virtual format.

Another disadvantage regularly identified was a reduction in the type and amount of information available. One reason commonly cited for this reduction in information was limited opportunities to informally interact with respondents. Focus group participants also attributed the reduction in information to limited non-verbal information and cues. This specific disadvantage was often mentioned in conjunction with comments addressing respondents' specific support needs and using certain types of technology. Increased fatigue was also frequently identified as a disadvantage. Focus group participants attributed increased fatigue to technology demands.

Impact on Timing. Participants consistently described the impact of the virtual format on the timing of the SIS-A administration throughout focus groups. Across all focus groups, participants identified ways in which the virtual format lengthened the amount of time it took to administer the SIS-A. Focus group participants attributed increases in administration time to the specific type of technology being used. For instance, multiple focus group participants recounted instances when they had to read the rating key to respondents participating in the SIS-A using

audio-only technologies, significantly lengthening the administration time. Finally, focus group participants noted a need to engage an increased number of respondents during virtual administrations, impacting the timing of administration. Focus group participants also identified numerous ways in which the virtual format increased time demands in ways unrelated to the administration itself but associated with the administration process overall. Participants cited an increased amount of time needed to prepare for the virtual administration format.

Although the virtual format often led to timing increases, participants also identified ways in which this format reduced certain timing aspects of the administration, an idea mentioned across all focus groups. Time reductions were primarily attributed to diminished travel demands. When discussing reductions, focus group participants also pointed to opportunities to develop and distribute final reports more quickly.

Factors Influencing the Effectiveness of Virtual SIS-A Administration

Although not a specific focus of semi-structured interview questions, focus group participants frequently identified and described various factors influencing the effectiveness of the virtual administration format. Two groups of factors were identified, respondent characteristics and technology types.

Respondent Characteristics. Across all focus groups, participants identified various respondent characteristics that influenced the effectiveness of virtual administration. Focus group participants made it clear that the virtual administration format was advantageous for people with certain types of support needs and disadvantageous for others. SIS-A Assessors indicated that respondents who struggle with transitions, who struggle to sustain attention, and who have specific medical conditions tended to benefit from the virtual administration format. SIS-A Assessors indicated that respondents who do not communicate verbally and respondents who

have hearing loss often do not benefit from the use of the virtual administration format.

Another type of influential respondent characteristic included comfort with technology. Focus group participants clarified that if respondents are comfortable with the technology being used to facilitate the virtual administration, this format can be very advantageous. Conversely, if respondents are uncomfortable with technology, this format can be disadvantageous.

Technology Type. Across all focus groups, participants identified ways in which different types of technologies influenced the process of virtual administration. From participants' commentary, it was clear that type of technology mattered. Overwhelmingly, participants felt that the use of technology with video capabilities was the preferred way of administering the SIS-A virtually, as it enabled the sharing of materials and provided opportunities to gain more information about and from respondents. Participants also frequently commented on the use of smartphones to facilitate video-based virtual administrations. Although this option was preferred to audio-only technology, participants indicated that the use of smartphones was not optimal, as it made it difficult to share materials and engage the full range of participants. Participants also reflected on limited and unstable internet access, which influenced respondents' ability to participate in virtual administration effectively.

The use of technology with audio-only capabilities was the least preferred virtual administration format. Participants indicated that this type of technology requires more time-intensive comprehension strategies, such as reading rating keys and requesting frequent verbal responses instead of relying on non-verbal cues. Additionally, participants shared that this type of technology further limits information available about and given from respondents.

Strategies for Enhancing the Effectiveness of Virtual SIS-A Administration

An important, albeit secondary, focus of semi-structured interview questions was on

identifying strategies that enhance the effectiveness of the virtual administration process. Identified strategies addressed rapport-building, supporting respondent comprehension, group facilitation, and technology problems.

Rapport Building. Across all focus groups, SIS-A Assessors consistently identified strategies for building rapport during a virtual administration. Certain strategies explicitly focused on establishing rapport with the primary respondentns (i.e., the people with disabilities who were being assessed). For instance, SIS-A Assessors recommended inviting the primary respondent to join the virtual meeting in advance of other respondents. Other strategies focused on establishing rapport with the broader group of respondents. SIS-A Assessors further emphasized the need to be very attuned to their respondents' facial expressions during the interview and to provide respondents with ample verbal reassurance that confirmed their respondents' input was correctly understood. Finally, the importance of inserting humor and projecting empathy throughout the interview was emphasized by the SIS-A assessors.

Supporting Comprehension. Although mentioned less frequently, another set of strategies focused on supporting comprehension throughout virtual administration. Participants recommended sharing relevant materials, such as the rating key and respondent guide, ahead of the meeting and taking time during the virtual administration to explain the materials. Specifically, participants noted the benefit of ensuring every respondent had access to the rating key throughout the virtual administration process. SIS-A Assessors also identified the need to encourage respondents to identify confusion.

A smaller portion of comments focused on strategies for supporting SIS-A Assessors' comprehension. SIS-A Assessors described the impact of virtual administration on their understanding of respondents with disabilities. SIS-A Assessors suggested taking time to learn

more about the primary respondent to offset this impact. For instance, one participant shared her preferred strategy, being introduced to the primary respondent.

Group Facilitation. The most frequently described set of strategies addressed group facilitation. To effectively manage groups in the virtual setting, SIS-A Assessors recommended identifying limits of the virtual format and providing workarounds. To ensure the participation of all respondents, SIS-A Assessors noted the benefit of encouraging all respondents to participate and calling on them by name to ensure this happens. SIS-A Assessors also noted the need to take frequent breaks.

Technology Issues. A final set of strategies, and the set of strategies most often brought up by focus group participants, addressed proactively addressing technology issues associated with the virtual administration format. To ensure a meeting without technical problems, participants described a need to identify and address potential technology issues before the meeting. At the start of meetings, participants recommended providing strategies to use throughout the meeting if technology problems arose. In rare instances, participants identified a need to have a case manager go to the house of the person with a disability to provide support with the technology throughout the meeting.

Future Use of Virtual SIS-A Administration

Each focus group reflected on the continued use of the virtual administration. SIS-A Assessors identified the types of training that would best prepare others for virtual administration and identified the need for decision-making guidelines and best practices.

Training Needs. As a result of COVID-19, many focus group participants did not have the opportunity to engage in targeted training before implementing the virtual administration format. As a result of this experience, they gained a clear understanding of the demands of the

different administration formats and the types of training that would best prepare future SIS-A Assessors. To prepare other SIS-A Assessors for virtual administration, focus group participants recommend training addressing technology. Specifically, training should prepare SIS-A Assessors to identify and solve technology problems and prepare them to utilize different technology features to support group facilitation. Participants also identified the need for training related to virtual administration strategies. Specifically, training should address strategies for engaging respondents in the virtual format, strategies for managing the group, and strategies for working within the confines of the virtual setting. Focus group participants described the need for training related to protecting privacy. Specifically, training should address strategies for maintaining confidentiality and protecting privacy in the virtual setting.

Guidelines and Recommended Best Practices. Throughout focus groups, participants repeatedly reflected on the continued use of virtual administration even after the need for social distancing is lifted. Given this likelihood, participants conveyed a hope that individual circumstances would inform the continued use of the virtual administration format instead of the application of blanket, inflexible policies. Specifically, focus group participants identified the influence of medical conditions, travel demands, and securing the appropriate number of respondents as variables that should be considered when deciding on the appropriateness of virtual administration. Focus group participants also communicated a desire to see the preferences of respondents with IDD inform the decision-making process over other variables.

Participants also conveyed a desire for there to be a set of guidelines to inform decision-making. They noted a need for a process for documenting the decision-making process. Not only were participants interested in guidelines to determine if the virtual format was appropriate, but they wanted a set of best practices to inform the manner in which the virtual administration is

carried out. Specifically, participants identified the benefit of guidelines addressing the meeting environment and technological "best practices."

Discussion

Administering the SIS-A virtually using video-conferencing technology has been of interest to researchers and practitioners alike. Given the frequent use of SIS-A scores as part of the high-stakes task of developing individualized budgets that cover the cost of LTSS, studying this topic would be ethically questionable under normal circumstances. With the onset of COVID-19 and the necessary shift in administration formats, a natural opportunity to research this subject arose. This study's results supported the validity of the virtual administration format. In the following sections, we describe this study's findings, note limitations, and discuss implications for practice and research.

Limitations

Before discussing the results of this study, it is essential to clarify certain design and analysis decisions and describe how they might have impacted results. Administration format was not randomized but instead relied on the format deemed appropriate in 2020 due to health and safety concerns, limiting generalizability of these results; the virtual sample may have been qualitatatively different as compared to the F2F sample. The secondary data set we received was deidentified, so the only age and state of residence were made available. As a result, relevant demographic variables, such as gender and race, and a full range of administration variables (e.g., time saved from not having to travel for interviews versus time lost due to technical issues) were not considered nor controlled for during quantitative analyses.

The primary limitation of this study's qualitative findings relates to the SIS-A Assessors who participated in focus groups. When conducting focus groups, we worked with a group of

experienced SIS-A Assessors. Although focus group participants' previous experiences enabled them to critically evaluate differences in administration formats and thus answer this study's research questions, it also likely impacted their ability to administer the SIS-A virtually and thus their perspectives on this new administration format. It is possible that findings would have been different had a group of less experienced SIS-A Assessors participated in focus groups.

Product Outcomes

The primary aim of this study was to determine the influence of the virtual administration format on SIS-A scores. Quantitative analyses indicated a significant difference between SIS-A raw scores generated using the virtual administration format and those generated using the F2F administration format. SIS-A raw scores were around ten points higher when the measure was administered using the virtual format (i.e., 346.126) than when it was administered using the F2F format (i.e., 336.421), a difference that translated to 1 point on the standardized score. Therefore, the impact of the raw score difference on standard scores (i.e., the scores used to inform individualized budgets and support planning) was negligible. Any slight differences would not have had a practical impact on budget development or supports planning in the vast majority of cases. However, it does support the importance of assuring that people are always provided the opportunity to appeal decisions regarding funding allocations (Thompson et al., 2018).

Process Outcomes

An additional goal of this study was to consider the influence of the virtual format on the process of administering the SIS-A. Qualitative findings offered several important insights into the influence of the virtual format on the process of administering the SIS-A. Of primary importance, focus group participants established that the virtual administration format is neither good nor bad; instead, it is different from the F2F format. To justify this assertion, participants

considered the impact of the virtual administration format on different types of respondents. Focus group participants identified numerous respondent groups for whom the virtual administration format was advantageous, pointing to respondents who struggled with transitions, respondents who struggled to sustain attention, and respondents who had specific medical conditions. Focus group participants also identified several respondent groups for whom the virtual administration format was disadvantageous, naming respondents who were uncomfortable with technology and respondents with hearing loss or limited verbal communication abilities.

As further rationale, focus group participants detailed the impact of the virtual administration format on their responsibilities as SIS-A Assessors. Time was one way in which the virtual administration format impacted the work of SIS-A Assessors. Focus group participants described diminished travel demands and timelier paperwork completion. More frequently though, focus group participants identified ways in which the virtual format increased time demands. Specifically, participants pointed to increases in administration-related time demands, such as engaging with larger groups of respondents during SIS-A meetings. Although increasing respondents adds time it can also add information. In analyzing SIS-A scores from over 33,000 adults with intellectual disability, Hagiwara et al. (2021) concluded that more respondents leads to more comprehensive information being collected, and therefore a more accurate reflection of a person's support needs.

Strategies were another area impacted by the virtual administration format. As a consequence of the challenges posed by the virtual format, SIS-A Assessors relied upon different group facilitation strategies and developed new ones. To ensure rapport formation in the virtual environment, focus group participants identified different means of connecting with respondents. To address comprehension challenges in the virtual environment, focus group participants

offered specific strategies for supporting respondents' comprehension, such as sharing relevant materials ahead of and during the meeting, as well as offering strategies for supporting their own comprehension, such as taking time to learn more about the primary respondent. Focus group participants also offered up numerous ideas of how to address group facilitation challenges in the virtual environments, as well as proactive and reactive strategies to employ when technology issues arose.

In addition to addressing the value of the virtual administration format, qualitative findings highlighted important considerations regarding the future use of the virtual administration format. To prepare other SIS-A Assessors for virtual administration, focus group participants recommended training to address technology, strategies for establishing rapport, strategies for group facilitation, and strategies for protecting privacy. Another consideration about the future of virtual administration related to decision-making. Throughout the COVID-19 pandemic, jurisdictions implemented across-the-board policies on the virtual administration format, removing the need for SIS-A Assessors to make decisions regarding its use. With the progressive loosenting of COVID-19 restrictions over time, focus group participants reflected on the imminent need to determine when and when not to employ the virtual administration format. Focus group participants established the need for guidelines to support decision-making. Among participants, there was agreement that decision-making guidelines should be responsive to individual circumstances and center the preferences and needs of respondents with IDD. A final consideration offered by focus group participants addressed virtual administration "best practices." Recognizing the numerous factors influencing the efficacy of virtual administration, focus group participants pointed to the need for jurisdictions to establish "best practices" that could be used to guide virtual administrations and ensure quality virtual meetings.

Implications

This study's findings provide reassurance for states or jurisdictions that relied upon the virtual administration format throughout the COVID-19 pandemic. Although quantitative results revealed statistically significant differences between raw scores generated using the F2F format and raw scores generated using the virtual format, the differences were small and not practically significant. As a result, in the vast majority of cases, these differences did not impact the distributions of funds or influence the planning of supports for people with IDD. Considering this, states operating HCBS waiver programs should have confidence in the results of SIS-A assessments generated using the virtual administration format.

For states that are interested in continuing to use the virtual administration format, this study's findings offer important insights. States and jurisdictions can use this study's qualitative findings to inform the development of virtual training materials. Additionally, qualitative findings can be used to inform the development of virtual format decision-making guidelines and virtual administration "best practices." For practitioners who are virtually administering the SIS-A, findings offer practical strategies. Practitioners can use this study's qualitative findings to inform their decision-making regarding the use of the virtual administration format, identifying situations in which this format may be advantageous or disadvantageous. Additionally, practitioners can learn from the virtual administration strategies described by focus group participants and implement them to enhance the effectiveness of their virtual administrations.

Future Research

Although this study provided valuable insights regarding the virtual administration format, additional research is needed to address this study's limitations. First, future analyses should be conducted using more robust datasets that include additional information about

participants with IDD, SIS-A Assessors, and specific administration procedures. Second, future studies should only utilize data generated from administrations led by SIS-A Assessors who have received training on virtual administration. Conducting analyses using such data will enable researchers to better control for group differences across administration formats and determine their influence on scores.

Outside of addressing this study's limitations, additional research should be conducted to further explore the impact of the virtual administration format on administering the SIS-A, both overall support needs index and subscale scores. Additionally, studies should consider the influence of specific virtual administration procedures on SIS-A scores. Such research will provide a more nuanced understanding of the impact of virtual administration. Finally, future research should include a more diverse group of SIS-A Assessors. Specifically, newly trained SIS-A Assessors, not just tenured assessors, should participate. Such research will provide insight into the importance of developing administration skillsets in a F2F environment.

Conclusion

The COVID-19 pandemic provided researchers an opportunity to explore the use of a new format when administering the SIS-A, a topic of longstanding interest. This study's results revealed that the virtual administration format impacted SIS-A scores, but the impact was of little to no practical importance, particularly in regard to people’s LTSS funding. States and jurisdictions should have confidence in the results of SIS-A assessments generated from virtual administration and be assured of this administration format's efficacy when considering its future use. Furthermore, states and jurisdictions should use this study's qualitative findings to inform the continued use of this administration format.

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Table 1

Invariance Testing Results Model Fit Indices

Model	x^2	*df*	*p*	CFI	ΔCFI	TLI	RMSEA	RMSEA 90% CI	SRMR	Decision
Measurement invariance										
Null (MLR)	1223.426	28	< .001	.952	---	0.948	0.114	0.108, 0.119	0.035	---
Configural	1133.79	18	< .001	.955	---	0.925	0.137	0.130, 0.144	0.025	pass
Weak	1132.46	23	< .001	.955	.000	0.941	0.121	0.115, 0.127	0.036	pass
Strong	1223.42	28	< .001	.952	.003	0.948	0.114	0.108, 0.119	0.035	pass
Latent invariance										
Latent Variance	1235.04	9	< .001	.951	.001	0.949	0.112	0.107, 0.118	0.100	
Latent Means	1252.71	9	< .001	.950	.001	0.949	0.113	0.108, 0.119	0.045	

Note. Each model contains its constraints, plus the constraints of all previous models. CFI: Compartive Fit Index; MLR: Robust Maximum Likelihood; RMSEA: Root Mean Squared Error of Approximation; SRMR: Standardized Root Mean Squared Residual TLI: Tucker-Lewis Index.

Table 2

Qualitative Codes, Sub-Codes, and Associated Quotes

Code	Sub-Codes	Associated Quotes
Outcomes of the Assessment	Product Outcomes	"The ratings I get, and the accuracy of the support needs, and the scores are not changed from what they would have been in person.
	Process Outcomes	"There's a little bit of loss of control. Control may not be the best word for that. But it's more difficult to manage the environment room because it's virtual."
Respondent-Characteristics	Specific to Respondent's Age	"If I see that the individual is in their late 40s and their parents are going to be respondents, I'm like, "Oh, in the virtual world this is going to be challenging."
	Specific to Respondent's Support Needs	"If we were in person, we would be able to interact with (the respondent) on a non-verbal level… but now, it's really tough to make a connection with them."
	Specific to Respondent's Comfort with Technology	"Whether they are comfortable with it (the technology) or not comfortable with it (the technology) makes a huge difference."
	Specific to Respondent's Familiarity with the SIS-A	"It is challenging to do a SIS with someone who is brand new, like a whole responding group who have never done them before and it's virtual."
Impact of Technology Type on Virtual Communication and SIS-A Administration	Impact of Using Technology w/Video Capabilities on Virtual Communication	"We're only seeing a small box because you're sharing your screen like you are today. And so we are sharing that rating scale, we're seeing that small person. So it's not like it's not always ideal."
	Impact of Using Technology w/Audio Only Capabilities on Virtual Communication	"The comfort level too when you're talking with the respondents, there's a lot that we are just missing with some of that. Especially when it's telephonic."
	Impact of Using Mobile Phones on SIS-A Administration	"You cannot do a SIS-A on a cell phone."
	Impact of Limited / Unstable Internet Access on SIS-A Administration	"If you've got somebody who drops the call suddenly and you're left with one person, you have to try to troubleshoot and call and try to get people back on."

Advantages of Virtual Administration	Increased Flexibility	“Or especially for supports coordinators as respondents, because they don't have to leave their office, so they're a little more willing to participate in the SIS. So I definitely think there are some advantages in getting good respondents because you don't have to all get to the same location.”
	Increased Number of Respondents and Perspectives	"Not having to travel places to do the SIS-A opens up a lot more possibilities in terms of people's time commitment and available respondents."
	Increased Accessibility for Respondents	“One other advantage too that I heard from families with members who have autism, sometimes it's less transition for them and it's easier just to... And less chaotic or whatever with just having the... Talking on the device.”
Disadvantages of Virtual Administration	Group Interview Facilitation Challenges due to Other Factors	"You're in-person with them, you ask them about their day, what kind of things they like, and it just puts them at ease… that's much more difficult, I think, on virtual."
	Group Interview Facilitation Challenges due to Distractions	“Many of the support coordinators and providers are distracted by a lot of stuff and they are doing their work, I think. I mean, I've even seen them taking calls.”
	Limited Information	“Especially if they're non verbal. It's hard if you're doing a phone interview. Sometimes they can get the individual to make a vocalization or something like that, but that connection, seeing their face, and if I'm speaking to them, if they smile, sometimes they'll tell me, "Oh, they did something." But yeah, it's hard. It is really, really hard.”
	Increased Fatigue	"I felt like I was having to emote so much more than I would (during a F2F administration) to try and get people to pay attention."
Impact of Virtual Administration on Timing	Increases in Time Related to Administration / Conducting the Interview	"In person, a lot of mine [referring to SIS-A meetings] were like two people…and now it's a line of people on the other end."
	Increases in Time Unrelated to Administration / Conducting the Interview	“Instead of looking up the address on the phone or on the computer before (we) drive to the house, (we are) having to meet with the people before and send out information on what a Zoom meeting looks like… so it totally changed that whole dynamic of the meeting.”

	Decreases in Time Unrelated to Administration / Conducting the Interview	"Same exact thing could have happened face-to-face. But, if I had already driven there and we were all sitting there around the table, we probably would have done the assessment."
Strategies for Virtual Administration	Related to Establishing Rapport	"I usually like to start with the member and say, "Everybody help me get to know the individual."
	Related to Supporting Comprehension	I'm "constantly going over the rating key so that they understand what the actual ratings are."
	Related to Group Facilitation	"I'll say, 'I can't see you nodding. You need to say yes, you agree, no, you don't.'"
	Related to Proactive Technology Solutions	"We're offering to set up a Zoom meeting and log in beforehand. That makes people feel comfortable. We'll have a little practice run before the actual SIS assessment, that can help."
	Related to Reactive Technology Solutions	"Just be prepared for any problems, having maybe paper available having, an offline assessment form available, having phone numbers so that if we're Zoom or Teams meet and something goes down, we're able to get that person or team back online via telephonically."
Need for Specific Training for Assessors	Need for Training Addressing Technology	"How to actually use the technology to administer the SIS–A…like how do you share screen? How do you split share? How do you teach people to do gallery view?"
	Need for Training on Strategies for Virtual Interviewing	"I do think that people that haven't had a little bit of additional training on virtual, it is very helpful. It just gives people, assessors, a good idea of what to anticipate, things that could go wrong. How to problem solve through things and how to build relationships when you're in a virtual or telephonic assessment."
Recommendations for Future Use of Virtual Administration after COVID	Need for Flexibility Based on Individual Circumstances	"Ultimately this should be about what's best for the individual… not what's best for their case manager."
	Need for Guidelines to Inform Decision Making around the Use of Virtual Administration	"I think there would have to be guidelines set up about who would be the one requesting that the SIS be completed virtually, or the need to log on virtually, because it wouldn't make sense to just offer that to anyone, the option there."
	Need for Guidelines to Support the Process of Virtual Administration	"We've mentioned before with the other questions, maybe something about sort of the etiquette of doing these and how to engage."

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Dear Dr. Symons,

On behalf of my co-authors, I would like to thank you for the opportunity to submit a revised version of "The Impact of Administration Formats on SIS-A Scores." We would also like to express our thanks to the reviewers for their helpful feedback, especially their suggestions for improvement. The manuscript has been revised to address the reviewers' comments. All revisions are identified using purple text. Additionally, in the document attached, you can find a list of reviewers' comments and descriptions of associated revisions. We believe that these revisions have resulted in an improved product and hope that the revised manuscript is accepted for publication in the *American Journal on Intellectual and Developmental Disabilities.*

Sincerely,

Sarah R. Carlson

Reviewer #1		
Reviewer's Comment	**Authors' Response to Reviewer's Comment**	**Location of Revision in Manuscript**
"Once the model was judged to be invariant for the strong model, we progressed to testing invariance of the latent means. Doing so enabled examination of mean level changes in the constructs across the two measurement occasions. A model constraining the latent means across measurement occasions was estimated and compared to the strong invariant model." What is the strong model? Many will view measurement invariance as examining structure, factor loadings, and indicator intercepts across groups.	The opening sentence describing multiple group invariance testing on Page #6 was edited to make clear the mapping of configural, weak, and strong models to tests of structure, factor loadings, and indicator intercepts, respectively. Other details were added to add clarity about the invariance testing process that was followed.	See "Data Analysis" section on Page #6
One other point, more of an editorial one, if the authors wish to reduce length/cut down on all the direct quotes, they could have themes/some results of the qualitative analyses summarized in a table. I know this is how it is typically done, but to have 40% or so of the manuscript on this seems like a lot.	We thank the reviewer for this comment. Based on your suggestion, we have incorporated a table to better summarize and convey qualitative findings, making this section more concise and findings clearer.	See "Table 2" on Page #28

Reviewer #2		
Reviewer's Comment	**Authors' Response to Reviewer's Comment**	**Location of Revision in Manuscript**
The authors describe the research design as an embedded mixed-methods design. My understanding of such designs, however, is that the information from both the qualitative and quantitative analyses should inform each other in answering unified questions (From Fetters et al., 2013: "Embedding may involve any combination of connecting, building, or merging, but the hallmark is recurrently linking qualitative data collection to quantitative data collection at multiple points.") In this case, the qualitative and quantitative pieces appear to be answering related, but different questions. I think this is fine given the purposes of the study, but the methods maybe need to be clarified in this regard.	We appreciate the reviewer's feedback. Upon reflection, we believe that Creswell's description of convergent design is better aligned with our research methodologies and have made edits accordingly.	See "Methods" on Page #5
Many AJIDD readers are not going to be very familiar with measurement invariance, so some additional information and clarity would be helpful in describing the methods and results for this section. For example, the methods section should include a description of each model, including what terms are included, and how these relate to the names given to the models (i.e., configural model). This is important because these terms are not used universally. This	We acknowledge that not all readers will be familiar with measurement invariance. In response to an earlier comment, additional description was added to the Analysis section for the Quantitative Methods. More detail was added to further describe the step-by-step comparisons required in the invariance process.	See "Methods" on Page #6

information is currently presented in the results section, but should be moved earlier in the paper.		
This section should also include the specific criteria that were applied to determine whether fit at each level was adequate to move to the next level.	The reader's comment is well-taken. Criteria were included in the Methods section but more detail was added when describing the process in greater depth, hopefully making the criteria more clear for the reader.	See "Methods" on Page #6
The authors should note that the results cannot rule out measurement invariance in SIS-A scores, as the null hypothesis of measurement invariance tests is that of no measurement invariance. Therefore, factors that reduce statistical power, (i.e., low sample size, small number of items per factor, lack of communality among items, etc.) actually increase the likelihood that the measure will be found to be invariant.	To address this point of feedback, we've clarified that data appeared to be invariant at the measurement level for this sample.	See "Quantitative Findings" on Page #10
The authors assume that the observed differences in scores between the remote and in-person assessments was exclusively due to administration format. The research design, however, does not rule out other potential explanations, which should be noted. Because these groups were not randomly assigned to administration formats, and the administrations were conducted during two different periods of time, these two groups may have differed systematically for other reasons. Were any	The issue of randomization and its impact on generalizability was addressed in the original manuscript. However, a phrase was added to acknowledge the potential differences between the virtual and F2F samples more explicitly.	See "Limitations" on Page #19

additional analyses conducted to determine whether there were any differences in the geographic distribution or other factors that may have been relevant? There were substantially fewer assessments conducted during the 2020 period compared to the 2019 period (the difference is about a 25% drop off in assessments from 2019), suggesting that fewer people may have participated in the process during this time, suggesting that these two groups may not be completely comparable. It also seems plausible that individuals support needs on average increased during the pandemic for various reasons; many people reported worsening stress and mental health issues. Some individuals may have lost longtime care staff or other support people, which could have contributed to additional needs. I recognize that the authors conclude that the increase in scores, while statistically significant, was probably not clinically meaningful, and I think the information presented is valuable. Nevertheless, these potential sources of variation should be discussed, as it is possible that such variation obscured variation actually due to administration format.		
Was the data reduction analysis approach inductive, deductive, or some combination of both? Who	We appreciate the reviewer's list of thoughtful questions and points of consideration	See "Data Handling and Analysis" on Page 9

was involved in the data analysis process, and what were their philosophical assumptions or positionality? What was the overarching approach to data analysis for the focus group data (i.e., grounded theory, phenomenology, etc.)? What was the overarching approach to data analysis for the focus group data (i.e., grounded theory, phenomenology, etc.)? The authors mention several different strategies (i.e., data analysis data reduction, constant comparative, open coding, and axial coding, with consensus and memoing), but exactly how these were implemented and the process of moving from one to another was unclear.	and have made edits accordingly.	
The rationale for the sample size for the focus groups is somewhat vague and unconvincing. See Malterud et al. (2015) for an alternative approach to sample size in qualitative work that may be helpful in formulating such decisions in the future.	The reviewer's point is well taken. A stronger rationale regarding focus group size is certainly a reasonable critique. However, the sample size of the focus groups is within the boundaries of accepted practice according to Harrell & Bradley (2009). We believe the size was sufficient to make the knowledge claims presented in the manuscript. We have made some small edits to the language to ensure clarity regarding this topic. We appreciate the recommendation of Malterud et al. (2015) and have saved it for future use.	See "Focus Group Procedures" on Page #9

I found the results section describing the qualitative results overly long and somewhat confusing. Some of the themes seem to overlap. For example, the flexibility and accessibility themes identified both describe respondents being more available as advantages. On the disadvantages side, difficulties in facilitating the discussions and reduction in amount of information available both talk about how a reduction in informal interactions makes it harder. This suggests that the data could be further reduced into themes that are more comprehensive.	We thank the reviewer for this comment. Per the suggestion outlined below, we have incorporated a table to better summarize and convey qualitative findings, making this section more concise and findings clearer.	
It is possible that putting the majority of the qualitative results into a table with themes and illustrative comments might dramatically reduce the length while maintaining the information.	We have incorporated this recommendation.	See "Table 2" on Page #28
The section on the strategies that interviewers using to facilitate virtual administration is somewhat redundant with the information presented in the advantages/disadvantages and seems to be mostly a list of individual comments rather than more general themes. Cutting this section would reduce the length of the results without losing much.	We thank the reviewer for this comment. As a result of incorporating Table 2 and editing the qualitative findings section, we have made this section more concise and findings clearer.	See "Strategies for Enhancing the Effectiveness of Virtual SIS-A Administration" on Page #15
Be careful of the language when describing the results of the qualitative analyses - themes do not emerge, but are constructed by the researchers	We appreciate this point of feedback. The manuscript was reviewed for instances of such language and edits were made accordingly.	See "Data Handling and Analysis" on Page #9 and "Qualitative Findings" on Page #11

based on the data. As such, analyses do not reveal information.		
To save space, much of the detail regarding the SIS-A can likely be cut out, and readers can be referred to other papers for detail as needed.	Details regarding the SIS-A were condensed in two locations and the measure's description is now more concise.	See "Supports-Intensity Scale: Adult Version" on Page #4 and "Measure" on Page #6
Does the "support needs factor" described in the data analysis section differ from the "Support Needs Index" described in the measure section? If not, it would be clearer to use the same name throughout, and the composites do not need to be described in two places. If they are different, additional information about how the composite was created and whether analyses were conducted to verify it's validity/utility are needed.	The term support needs factor refers explicitly to the support needs latent variable, also referred to as a factor or construct, in the confirmatory factor analysis model. The phrase was used to verbally describe the factor model for the reader. Language was added to the last paragraph in the quantitative findings section to clarify the relationship between the support needs factor estimates and the corresponding standardized support needs index values.	See "Quantitative Findings" on Page #11
Include a note explaining all abbreviations for Table 1.	A note explaining Table #1's abbreviations has been included.	See Table 1 on Page #27