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Influence of Access to Social Media on Caregiver and Provider Knowledge for  
Children in Early Intervention

by

Heather Wulff Tull

A thesis

submitted in partial fulfillment

of the requirements for the degree of

Master of Science in the Department of Communication Sciences and Disorders

Idaho State University

Fall 2023

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## Committee Approval

To the Graduate Faculty:

The members of the committee appointed to examine the thesis of HEATHER WULFF TULL find it satisfactory and recommend that it be accepted.

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RE: Study Number IRB-FY2023-78: Influence of Access to Social Media on Caregiver and  
Provider Knowledge for Children in Early Intervention

Dear Ms. Wulff:

I have reviewed your application for revision of the study listed above. The requested revision involves:

Both groups will be asked to follow one of two accounts, and asked to like and/or comment on each post to demonstrate that they had some degree of interaction with the content. Group B will also be instructed to follow an Instagram account, but only be presented with images of kittens. The reason for this addition is to provide both groups with media exposure.

You are granted permission to conduct your study as revised effective immediately. This study is not subject to renewal.

Please note that any further changes to the study must be promptly reported and approved. Contact Tom Bailey (208-828-2179; email [humsbj@isu.edu](mailto:humsbj@isu.edu)) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP  
Human Subjects Chair

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## List of Abbreviations

AuD	Audiologist
CDHH	A Child who is Deaf or Hard of Hearing
DHH	Deaf or Hard of Hearing
EI	Early Intervention
SLP	Speech-Language Pathologist

Influence of Access to Social Media on Knowledge for  
Children in Early Intervention

Thesis Abstract–Idaho State University (2023)

Objective: To determine if social media impacts and caregiver knowledge of communication strategies for children who are deaf and hard of hearing.

Design: Controlled Pretest-Posttest. Participants recruited according to inclusionary criteria: a) be over 18 years old, and b) have and view Instagram daily. Participants were randomly assigned to control and treatment groups. Each followed and viewed an Instagram account for eight consecutive days. Only the treatment group received content pertaining to communication strategies.

Results: The treatment group exhibited increased knowledge of communication strategies from pretest to posttest and when compared to the control group. With varying results, the treatment group also followed more health-related accounts from pretest to posttest and when compared to the control group.

Conclusions: Positive outcomes for increasing caregiver knowledge on communication strategies in the field of speech-language pathology look promising. Continued research on the efficacy of social media as a means to reach those who may not otherwise receive access is necessary.

Keywords: speech and language pathology, caregivers, coaching, access, social media, deaf and hard of hearing, early intervention

## **Introduction**

Caregivers and providers, whether at home or in a school setting, play an important role in a child's language development. Therefore, it is important that those who communicate with children know how to facilitate and model language. The use of social media has increased significantly in recent years, particularly related to sharing resources and providing education for caregivers and providers; yet, there are few studies examining if and how social media impacts adult knowledge of communication support. The purpose of this study is to determine if access to social media content impacts adult knowledge in the context of supporting communicative environments. If social media does have an impact on adult knowledge, there are important implications for early intervention.

## **Review of the Literature**

### **The Need in Early Intervention**

The need for and benefit from early intervention (EI) services have been widely researched and well-established. EI is likely to be more effective, less costly, and lessen the quantity of intervention needed when provided earlier in life rather than later. For example, two cost-benefit analyses of EI programs in low-income communities found between \$7.14 and \$12.90 returned for every dollar invested in EI programs for their respective communities (Reynolds, et al., 2002; Belfield, et al., 2021). As speech-language pathologists (SLPs) have access to more accurate screeners and earlier identification of language delays, clinicians face an increased need for EI services for families. In fact, while EI is excellent for those able to take advantage of services, many children who need services do not receive them. For example, in a longitudinal study of 8950 families in the United States with children born in 2001, Rosenberg et al. (2008) found that 13% of children from nine to 24 months have delays eligible for services,

while only 2.67% are receiving early intervention services. Prominent barriers to EI service delivery include difficulties incorporating services into everyday routines, implementing coaching, engaging the family, and communicating and collaborating within the EI team (McClelland et al., 2017; Fleming et al., 2011; Weglarz-Ward et al., 2020). Unfortunately, more nuanced barriers exist for specific populations.

In a qualitative interview of six clinicians (Fulcher et al., 2015), barriers to successful outcomes in Children who are Deaf and Hard of Hearing (CDHH), included living in rural or remote areas, the lack of clinical experience and confidence in providing intervention for infants under 6 months of age, and challenges associated with having a culturally and linguistically diverse backgrounds. Additionally, a retrospective analysis of 53 children born with congenital hearing loss (Bush et al., 2014) showed that children from rural regions were delayed in diagnosis and treatment compared to children from urban areas. Families of children with hearing loss also report a lack of confidence and resources necessary for healthcare decision-making for their child (Eleweke & Rodda, 2000). Because these barriers are incredibly intricate, there is a need for alternate sources of information and support than traditional, face-to-face relaying of information to families related to language facilitation and support. As such, social media may present a unique solution to the challenges presented above, due to its innate properties of communication, accessibility, and interactivity.

### **An Argument for Social Media**

Even as of 2010, it has become common practice for Speech-Language Pathologists (SLPs) to provide strategies and tips to clients via social media, namely Facebook, Twitter, and Instagram, but also Pinterest, Snapchat, and others (McGary, 2010). ASHA has released information regarding social media use as it pertains to accessibility, professionalism, ethics,

privacy and confidentiality, and civility (McGary, 2010; Merkel-Walsh & Moore, 2018; American Speech-Language-Hearing Association, n.d.). However, guidance on evidence-based practice (EBP) for social media's use as supplementing SLP services has not yet been established. It is speculated that this is due to the breadth of SLP settings in which social media could be applied, the variability in quality of social media posts and content, as well as the fast-paced, ever-growing, and changing nature of the internet. For example, Thompson & Zimmerman (2019) published a qualitative questionnaire survey to understand the prevalence and rationale for mobile apps to support pediatric SLPs. Of the 485 participating SLPs, 83% used mobile apps <50% of the time across the varying age groups. Mobile apps were used for intervention (36.1%), clinical information (21.8%), parent education (13.7%), assessment (12%), client education (9.8%), and other uses (5.0%). Cost of the mobile app and lack of EBP were the highest reported barriers (Thompson & Zimmerman, 2019). While apps can be beneficial for information targeting a specific treatment approach or population, it often has barriers in accessibility and cost for the user, and technology or programming barriers for the creator. Because social media is a free and frequently used resource, technology barriers for content creation are low, and it may be more accessible to the SLP, caregivers, and providers, as compared to an app. Should social media prove to be beneficial in aiding the EI team, it is important to give special consideration on how information is presented.

### **Creating Interactive Visual Content for Engagement**

Any content presented in the field of speech-language pathology should combine effective elements demonstrated through the countless research in a variety of fields. The following outlines a brief evolution of effective media as it pertains to creating engaging material to support the adult learning process.

**Text vs Graphic.** When compared to text, visual content shows better comprehension and memory. In a study recording event-related potentials of 40 university students, it was determined that, in order, intentionally-learned pictures are remembered more than incidentally-learned pictures, intentionally-learned words, then incidentally-learned words. This is because processing words becomes an automatic process, while engaging with visual stimuli requires additional attentional resources (Noldy, Stelmack, & Campbell, 1990). Despite requiring more mental resources, observed properties from engaging with graphics compared to text alone includes its ability to acquire more attention to the information presented, obtain more audience engagement, increase its likelihood to be shared, and be perceived as higher quality (Lazard & Atkinson, 2015).

**Dynamic vs Static.** Historically, an adult's prior knowledge and current goals have been shown to guide attention and memory for new relevant information presented in static images (Henderson et al., 2009) and text (Rayner et al., 2001). To determine if these effects were preserved with video content, Smith, Loschkey, & Bailey (2021) presented short videos of activities relevant to younger and older adults. Researchers confirmed that knowledge and goal-related information guided attention and memory. Furthermore, there were no age-related differences in attention to goal-related activities when the older adults had relevant prior knowledge and self-reported familiarity with the activity compared to younger adults (Smith, Loschkey, & Bailey, 2021). This suggests that prior knowledge and goals related to specific content are desirable prerequisites in order to maintain the attention and aid with memory in adult participants.

**Multiple Modalities.** Moreover, in a randomized, controlled group study of 236 undergraduate education major students, an analysis of variance demonstrated the effects of simultaneous and

sequential presentation of a visual stimulus when paired with either written language or auditory language. The group presented with simultaneous visual stimulus and auditory language had the most understanding of the content (Tiene, 2000).

**Interactivity.** The ability for the material to be manipulated by the user has various positive effects. Interactivity is linked to increased information processing, engagement, and understanding (Grainger, Mao, & Buytaert, 2016). In a study previously discussed, it was also found that prevalence of social media has created an increase in visual content consumption and visual literacy, and that comprehension supported by interactive visualizations is not predicted by learning-style preference or perceived abilities in visual literacy (Lazard & Atkinson, 2015). This highlights that anyone can benefit from comprehension of interactive visualizations, including caregivers and providers.

**Engagement.** Media Richness Theory outlines that the more contextual cues a message is able to reproduce (e.g., gesture, tone of voice, etc.), the “richer” and more effective the message (Daft & Lengel, 1986). In a comparative analysis of the effectiveness of instructional formats of higher education, the following hierarchy was supported: face-to-face, video conferencing, synchronous audio, text-based chat, e-mail, asynchronous audio, then threaded discussion (Newberry, 2001). Likewise, the researchers proposed that the richer and more personal communication was more effective than less rich and less personal media. While early intervention has had successful outcomes for personal (i.e., child-centered) face-to-face and video-conferencing modalities, there is little to no evidence on asynchronous interactive video-based content via social media. However, a multiple-case study design of popular brand advertisements via social media supported that the richer the message, the more engagement it received online (Coursaris, Van Osch, & Balough, 2016). Another important effect described in a meta-analysis of 36 studies



found a positive relationship between social media use and participation, 50% of which were statistically significant (Boulianne, 2015). Social media use as a means to increase adult participation in learning has potential, especially when considering the evidence for caregiver language models on facilitating children's language development.

### **Caregiver Language Models in Early Intervention**

Primary caregiver education has been found to have a positive effect on both qualitative and quantitative measures of child-directed speech. In a longitudinal study of 50 parent-child dyads, primary caregiver education was related to an increase in word tokens, vocabulary diversity, rare word use, and decontextualized utterances (Rowe, 2018). Since knowledge of language facilitation can be taught, equipping caregivers and providers with this toolkit through social media would be invaluable. In addition to caregiver education being effective in supporting a child's language, a study including 23 staff members provided with the Hanen Early Childhood Educators (ECE) Programme demonstrated that providers can also be facilitators in a child's language. Based on qualitative analysis, 84% of the 104 40-50-month children randomized into 2 test-retest groups improved in the area of social communication. Across the pre and post-survey, staff indicated that they were more confident in identifying and supporting children's speech and language difficulties after the training, and that they had the skills to do so (Coulter & Gallagher, 2001). Ensuring that both caregivers and providers develop the skills and confidence necessary to take an active role in their children's needs is crucial.

### **Application for Children who are Deaf & Hard of Hearing (CDHH)**

Thanks to the newborn screening, hearing loss is identified in 1.65/1,000 births, comprising 50% of the identified conditions (Sontag et al., 2020). The success of the newborn hearing screening has increased the need for prepared EI teams (Harrison, Roush, & Wallace,

2003). Because there are no set standards and coursework, and practicum experience varies among EI professionals, many providers do not have adequate experience working with CDHH (Marge & Marge, 2005). For example, it is likely that a care provider will offer services to CDHH and their families, yet may not know how to optimize hearing technology. Another practical application for EI professionals is understanding that noise is a factor that can impact a child's ability to develop speech and language. Background noise is commonly created by sounds around the home and school that go unnoticed by many adults. This means that many providers may not know or be confident in identifying areas contributing to difficulties for CDHH. Given the fact that many providers may lack experience or coursework focused on CDHH, there is rationale to pilot these strategies.

### **Objectives**

The primary goal is to determine if social media influence has an effect on adult knowledge, such that effective models of communication can be disseminated to benefit children in Early Intervention (EI). More specifically, the Research Questions are:

(RQ1) For participants in the study, does access to information via social media increase knowledge of ways to improve communication in daily environments when compared to those without access to information via social media?

(RQ2) Do participants who follow the study Instagram account follow more accounts related to health and communication after the study and when compared to those who did not follow the Instagram account?

(RQ3) How much information from social media is retained and applied in a test scenario?

From the above Research Questions, the following Hypotheses are made:

(H1) Individuals who received access to content via social media will increase their knowledge of ways to improve communication in daily environments when compared to those who did not receive access to information via social media.

(H2) Participants who were asked to follow the study Instagram account will increase in the number of health and communication accounts followed a) from pretest to posttest and b) when compared to participants who were not asked to follow the study Instagram account.

(H3) Over a week, 50% of the information presented from social media will be retained and applied in a test scenario.

## **Methodology**

### **Overview**

Due to the limited research surrounding caregiver knowledge of communication strategies as taught through social media, particularly those used to optimize communication environment for CDHH, the design was meant to collect foundational information to further study this topic and its efficacy in communication sciences and disorders. Therefore, this study was a Pretest-Posttest Control Group Design. The study was approved by the Idaho State University Institutional Review Board.

### **Participant Characteristics**

The population of interest was caregivers and providers who engage with social media, but may not have access to specific information or services due to a variety of barriers. Because reaching those who may have a need but lack access to resources is of utmost importance for the purpose of this study, the following inclusionary criteria was established: a) be at least 18 years of age, and b) have an Instagram account viewed at least once daily as measured by self-report data in the initial questionnaire. No restrictions based on demographic information were made.

Demographic information was collected to determine whom the data may represent. Participants were between the ages of 18 and 61, with a mean of 33 years old and a median of 30 years old. The participants included 17 females and 3 males. All 20 participants were fluent in English, with five also fluent in Spanish, and one fluent in Japanese. Of the 20 participants, 19 disclosed their race and ethnicity, with 18 identifying as White and one as Asian, and three as Hispanic or Latino.

In order to understand possible exposure to material presented during treatment, a question about education level as well as the participant's role and relationship to a child were included. All participants completed secondary education, with two participants achieving some college, one an associate's degree, nine bachelors' degrees, and eight pursuing or received graduate degrees. Two participants' primary role was a parent whose child had never received early intervention services, one whose child had previously received early intervention services, and two whose child is currently receiving early intervention services. Three participants had a primary role as a caregiver (i.e., preschool teacher or support), 10 participants were practicing SLPs or students, and two participants had none of the above apply. These characteristics are summarized in the table below:

Table 1: Demographic Information

Table 1 <i>Demographic Information</i>			
		Frequency (N)	Percent
Sex	Female	17	.85
	Male	3	.15
Age	18-29	9	.45
	30-39	6	.3
	40-49	1	.05

	50-59	3	.15
	60+	1	.05
Race	Asian	1	.05
	White	18	.9
	Prefer Not to Say	1	.05
Ethnicity	Hispanic/Latino	3	.15
	Not Hispanic/Latino	16	.8
	Prefer Not to Say	1	.05
Fluent Language	English Only	14	.7
	English, Spanish	5	.25
	English, Japanese	1	.05
Highest Level of Education	Associates degree	2	.1
	Some college	1	.05
	Bachelor's degree	9	.45
	Higher Education	8	.4
Role to a Child	Parent, No EI	2	.1
	Parent, Prior EI	1	.05
	Parent, Current EI	2	.1
	Caregiver	3	.15
	SLP or SLP student	10	.5
	None apply to me	2	.1

*Note.* EI = Early Intervention, SLP = Speech-Language Pathologist

### **Sampling Procedures and Size**

Participants were recruited via email using convenience sampling. The sampling pool was 26 community members in California known by the researcher, 306 Speech-Language Pathology and Audiology students and faculty at Idaho State University, and 51 individuals that followed the study Instagram account prior to content being released.

From the 28 candidates, four did not fulfill the inclusionary criteria, as one did not have an Instagram account, and three reported to view their account less frequently than once per day.

This resulted in 24 participants at the start of the study, but an additional four participants were excluded from the study due to attrition. The final sample size included 20 participants.

Table 2: Recruitment and Sample Size

Table 2 <i>Recruitment and Sample Size</i>				
<b>Invited to Participate</b>	<b>N</b>	<b>Completed Questionnaire n, (%)</b>	<b>Qualified for Study n, (%)</b>	<b>Completed Study n, (%)</b>
SLP & AuD students & faculty at ISU	306	10 (.03)	10 (1)	9 (.90)
Community	26	16 (.62)	12 (.75)	11 (.91)
Instagram users	51	2 (.04)	2 (1)	0 (0)
<b>TOTAL</b>	<b>383</b>	<b>28 (.07)</b>	<b>24 (.85)</b>	<b>20 (.83)</b>

*Note.* SLP = Speech-Language Pathology, AuD = Audiology, ISU= Idaho State University

## Measures

A flier explaining the purpose of the study, criteria for participants, and the expected steps and timeline to participate was attached to an email as a pdf and sent to 383 individuals (see Appendix 1). All individuals were invited to complete the initial questionnaire via Google Forms, accessible via a hyperlink contained in the email body and a QR code depicted in the attached study flier.

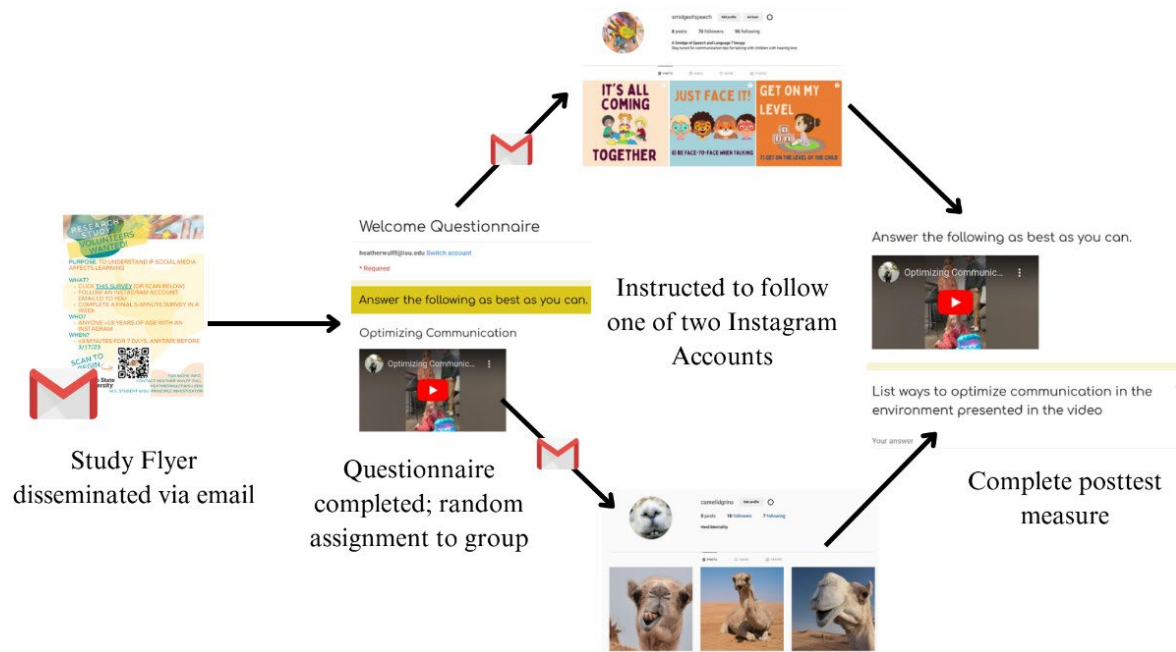
The initial questionnaire consisted of three major sections. Section 1 required a participant email address to match pretest and posttest responses and inclusionary criteria questions to determine eligibility. The inclusionary criteria questions terminated the survey for individuals who responded being younger than 18, not having an Instagram account, or not viewing their Instagram Account at least once per day. This section also included a description and timeline of the study. Section 2 included the pretest measure, presented in the format of a brief video in the living room of a house and the open-ended question to “list ways to optimize communication in this environment” (Appendix 3). Participants were blinded to the focus of the

study as it related to noise and children who are DHH. This video was used for both the pretest and posttest measures to preserve the types and number of strategies presented. Finally, Section 3 included demographic information questions to determine who the results may represent. All questions on the pretest and posttest measures were required, in that the Google Form did not allow for submission unless all questions were answered. Requiring answers to all questions allowed clearer analysis across participants. The initial questionnaire can be found in Appendices 2 through 4.

After completing the initial questionnaire, individuals were randomly assigned a three-digit number using a random number generator in the order responses were generated. Every participant had an equal chance of being assigned to either the treatment or control group. Even numbers were assigned to the Treatment Group and odd numbers were assigned to the Control Group.

The Treatment Group was instructed via email to follow an Instagram account developed specifically for the purposes of the study (Appendix 5). This Instagram account posted an introductory post, six stimuli posts (one per day consecutively), and a review post of the presented content. All content was presented over eight consecutive days. Content focused on maximizing communication in daily environments (e.g., rooms in the home, outside, and in the classroom), of young children who are DHH. After eight days, all groups were sent the posttest measure identical to the pretest measure via email in a Google Form. This measure was to determine if social media had an impact on participant knowledge. The posttest was sent out between seven and eight days after the pretest was completed.

Figure 1: Flow of Participants



Participants progressively joined the study (i.e., there was ongoing recruitment throughout the study), and it appeared that there were differences in the number of strategies reported between those who began the study on time, versus the individuals who started late. Therefore, a total of three groups were analyzed: Treatment Group A, Late Treatment Group B, and Control Group C. While all groups were sent the posttest measure between seven and eight days after completion of the pretest, the number of days it took for participants to respond to the posttest varied. Table 3 below shows these ranges and means across groups.

Treatment Group A was the first wave of six participants who received exposure to Instagram posts released on a daily basis. They were asked to like and/or comment on posts, and had the chance to see posts in their Instagram feed daily. The range of time it took them to complete the pretest and posttest was between eight to 19 days, with a mean of 11 days.



The second group, Late Treatment Group B, consisted of three participants who joined the study after posts were already released. Upon completion of the initial questionnaire, they were explicitly instructed to review all previous posts created by the Instagram account, spending about 2 minutes on each post per day as determined by “liking” and/or commenting on each post daily for all previous posts. The additional instruction to view previous content was included because no new content was actively being released, and therefore, Late Treatment Group B had less of a chance for content to appear in their feed daily. The posttest was still sent to individuals between seven and eight days upon completion of their respective pretest measure. The range of response time between pretest and posttest measures for this group was between 13 and 15 days, with a mean of about 14 days.

Finally, the third group, Control Group C, did not receive treatment, but were instead instructed to follow an alternative Instagram account that posted pictures of smiling animals (Appendix 6), and instructed to “like” and/or comment on each post. This account likewise posted content once daily for eight consecutive days, and participants completed the posttest measure with a range of about eight to 20 days, and a mean of about 10 days.

Table 3: Time Between Pretest and Posttest

Table 3 <i>Time Between Pretest and Posttest</i>							
Treatment Group A		Late Treatment Group B		Control Group C		Total	
mean	range	mean	range	mean	range	mean	range
11.2	7.8 - 18.9	13.8	13.2 - 15.0	10.1	7.8 - 20.3	11.0	7.8 - 20.3

As the action to “like” a post will be referenced throughout the paper without quotations here on, its definition follows. To “like” a post means that a user clicked a heart icon on a post to represent that they liked the message. This is displayed on the post itself as a number of those

who liked the post, but when clicked, also lists the users' account names. This is visible to those who follow the account of the liked post. For the purpose of concision, references to "like" a post refer to the action of selecting the heart icon, rather than the more conventional meaning to like something.

After the posttest measure, a follow-up explanation of the study was provided, and all participants, regardless of assigned group, were invited to access resources via the Instagram account.

### **Data Collection**

Data was collected from two main sources: 1) responses and information obtained from the pretest and posttest Google Forms, and 2) information gathered on Instagram. The information gathered on Instagram included the reach, number of likes and comments per post, and the number of health-related accounts followed by each participant at the beginning and end of the study.

The pretest-posttest measure was formatted as an open-ended question to allow the collection of the most general responses in order to understand the breadth and depth of knowledge respondents had at that time (i.e., to better determine if and how social media may impact awareness of noise in the environment). This format also allowed participants to list ideas and strategies not presented during treatment that may also be effective, as the treatment of communication disorders is incredibly vast and dynamic. Responses from the Google Forms were populated into a Google spreadsheet where they could be scored.

### **Stimulus Strategies**

The strategies targeted in the pretest and posttest stimulus were selected based on answering specific criteria questions (Table 4). First, they were selected given their perceived

importance to maximize communication with a child who is DHH after a review of the literature. Second, the strategy must have been able to be presented visually via social media such that it may be easily understood for new learning. Finally, strategies were omitted if they were too basic or too general such that most individuals would already know the communication strategy.

Table 4: Stimulus Strategy Criteria

Table 4 <i>Stimulus Strategy Criteria</i>		
1	Is this a documented strategy for a CDHH?	Yes
2	Can this strategy be visually represented well on Instagram?	Yes
3	Is the content too complex for one post?	No
4	Is the content too basic or general that most individuals would already know it?	No

*Note.* CDHH = Child who is Deaf or Hard of Hearing

### Response Scoring

After responses from the posttest measure were complete, responses were populated into a new tab of the existing Google Spreadsheet. Posttest responses were copied such that an individual row of the spreadsheet represented all data from one participant. Then, all information was hidden, and responses were sorted alphabetically according to the first letter in the response. This blind-test ensured that the scorer didn't know any participant information, as well as whether the responses were from a pretest or posttest. Once all 40 responses were scored, columns were unhidden and the tab was resorted to interpret scores according to pretest and posttest and by group. This produced an average number of strategies per person per group for both the pretest and posttest.

The stimulus video presented in the pretest and posttest measures included eight non-comprehensive coded strategies to maximize communication with a child who is deaf or hard of hearing (Table 5). A number-point system was used to thematically organize strategies,

(i.e., strategies about reducing noise include strategies 1.1 through 1.8; strategies about physical space include strategies 2.1 through 2.5, etc.).

Table 5: Explicit Strategies Presented in Content Treatment

Table 5 <i>Explicit Strategies Presented in Content Treatment</i>		
Strategy 1 - Noise	1.1	Reduce Background Noise
Strategy 2 - Physical Space	2.1	Reduce the physical distance between you and the child; go to the room they occupy
	2.2	Reduce the physical distance between you and hearing device
	2.3	Get on the physical level of the child
	2.4	Be face to face with the child
Strategy 3 - Hearing Device	3.1	Determine that the child's hearing device is turned on
	3.2	Determine that the child's hearing device secure
Strategy 4 - Caregiver	4.1	Call attention to sound: talk about what the child is interested in

Table 6 identifies six strategies that were indirectly, but not explicitly, presented through treatment content on the Instagram account. The strategies in this table were presented through both a visual image and written word for each strategy, and were all related to Strategy 1 - Noise. They were uploaded via the third content post on the fourth day of the study.

Table 6: Indirect Strategies Presented in Content Treatment

Table 6 <i>Indirect Strategies Presented in Content Treatment</i>		
Strategy 1 - Noise	1.2	Turn off the fan, air conditioning, heating unit and/or humidifier
	1.3	Turn off the television
	1.4	Turn off music/radio/podcast
	1.5	Limit toys producing excess noise
	1.6	Take turns talking with other people in the room
	1.7	Turn off the phone ringer

Additional strategies not presented in content were identified by participants in both the pretest and posttest measures. These ten strategies were also tracked and scored in order to compare the total number of communication strategies across measures and groups (Table 7). This is because there are numerous effective communication strategies, and participants should not be limited in their expression or use of strategies, but rather build upon their current understanding. This results in a total of 24 coded strategies used for the purpose of scoring responses in this study. For a list of all compiled pretest and posttest responses, see Appendix 7.

Table 7: Participant Reported Strategies Not Presented in Content

Table 7 <i>Participant Reported Strategies Not Presented in Content</i>		
Strategy 1 - Noise	1.8	Let the dog out if obstructing communication
Strategy 2 - Physical Space	2.5	Make eye-contact with the child
	2.6	Reference to orientation, visual field, or "in view"
Strategy 3 - Hearing Device	3.3	Reference to give/make sure child is using the hearing aid
Strategy 4 - Caregiver	4.2	Acknowledge, talk with, engage, include the child in conversation
	4.3	Include signs, gestures to increase accessibility to language
	4.4	Seek education, a referral, and/or a resource
	4.5	Implement/include greeting/introduction in language routine
	4.6	Vary intonation
	4.7	Use developmentally appropriate language

Each participant was assigned two scores for the pretest and two scores for the posttest. The first score was the sum of points assigned per explicit strategy targeted in the study. This was tracked to determine whether the targeted strategies would increase. The second score was the sum of points assigned per reported communication strategy, including indirectly presented

strategies, as well as novel ideas participants reported. This was tracked to determine whether the total number of strategies reported would increase, as this would likely mimic a successful therapy outcome.

No additional points were given for repeated strategies (e.g., “talk to the child, not about the child” and “include the child in conversation” would only receive 1 point). If an individual gave an overall strategy and listed two examples, this would earn them one point for the explicit strategy, and three points for the total number of communication strategies. For example, one response was: “Reduce background distraction by turning off music and tv.” They received one point for the explicit strategy “Reduce Background Noise” and three points for general communication strategies, including the explicit strategy and two more for “turning off music” and “and tv.”

In addition to the pre- and posttest measures, the number of health and communication-related accounts the participants followed on Instagram at the beginning and end of the study was recorded. This was obtained by following accounts who participated in the study using the study Instagram accounts. Tracking the number of health accounts helped determine if there was a relationship between exposure to the treatment Instagram page and increase in health and communication-related accounts followed from pretest to posttest and when compared to the control group.

## **Results**

### **Participation**

Because participation is important for the success of adopting communication strategies, it is interesting to note patterns that arise within recruitment and participation. There were two ways to access the initial questionnaire: a hyperlink contained in the email, and a QR code

pictured in the attached flier (Appendix 1). Of the 28 candidates who accessed the initial questionnaire, only one individual accessed the survey via QR code, accounting for 3% of the sample size.

The rate of participation from the sample pools was also notable. Of the 26 community members emailed by the researcher, 16 completed the initial questionnaire. Of those, 12 qualified to participate, and 11 completed the entirety of the study, resulting in a successful recruitment rate of 29% for this sample. Compared to the 306 Speech-Language Pathology and Audiology students and faculty at Idaho State University, only ten participated, all of whom were SLP graduate and undergraduate students. Nine students completed the study for a rate of 4% of the initial 306 individuals. It should also be noted that the researcher only personally knew 20 of the 306 (6.5%), and personally knew three of the nine participants from the study (33%). In contrast, of the 51 individuals contacted through Instagram who followed the Instagram account (and strangers to the researcher), only two participated initially, but both did not complete the final questionnaire. These data suggest that familiarity with the participant may have a positive effect on their participation in the context of this study. A concise visual for these data can be found in reviewing Table 2 above. Another variable possibly attributed to increased familiarity with the participant was low attrition. Despite multiple medium changes required to successfully complete the study (i.e., between email, Google Forms, email, Instagram, email, and Google Forms once more), participants completed the study in high numbers. Additionally, no participant data required to be discarded for incompleteness of individual pretest or posttest questions. Participants appeared to complete all observable aspects of the study, with the exception of “liking” and/or commenting on posts, see discussion in a later section.

## **Data Analysis**

After compilation of responses, the average number of explicit and total strategies participants reported per test was analyzed. A total of 20 participants were represented, with six in Treatment A, three in Late Treatment B, and 11 in Control Group C. Explicit strategies reported (row 1) is the number of times an explicit strategy presented in content stimuli (one of eight strategies listed in Table 5), was reported by a participant on either the pretest or posttest. From this number, the average number of explicit strategies reported per person (row 2) was calculated (i.e., the average number of explicit strategies a participant identified on their test). This number was tracked to help determine if hypothesis (H1: Individuals who received access to content via social media will increase their knowledge of ways to improve communication in daily environments when compared to those who did not receive access to information via social media) was supported or not. Explicit strategies represented (row 3) is the number of explicit strategies participants in that group identified out of the eight total explicit strategies. This was tracked to determine if knowledge across specific content areas (i.e., type of explicit strategies) increased with treatment. The three above defined analyses were also conducted for the total number of strategies, which includes explicit, indirect, and other participant-identified strategies (reported in rows 4-6). The final analysis can be found in columns labeled “%”, which represent the percent increase from pretest to posttest for that group. This information can be summarized in Table 8.

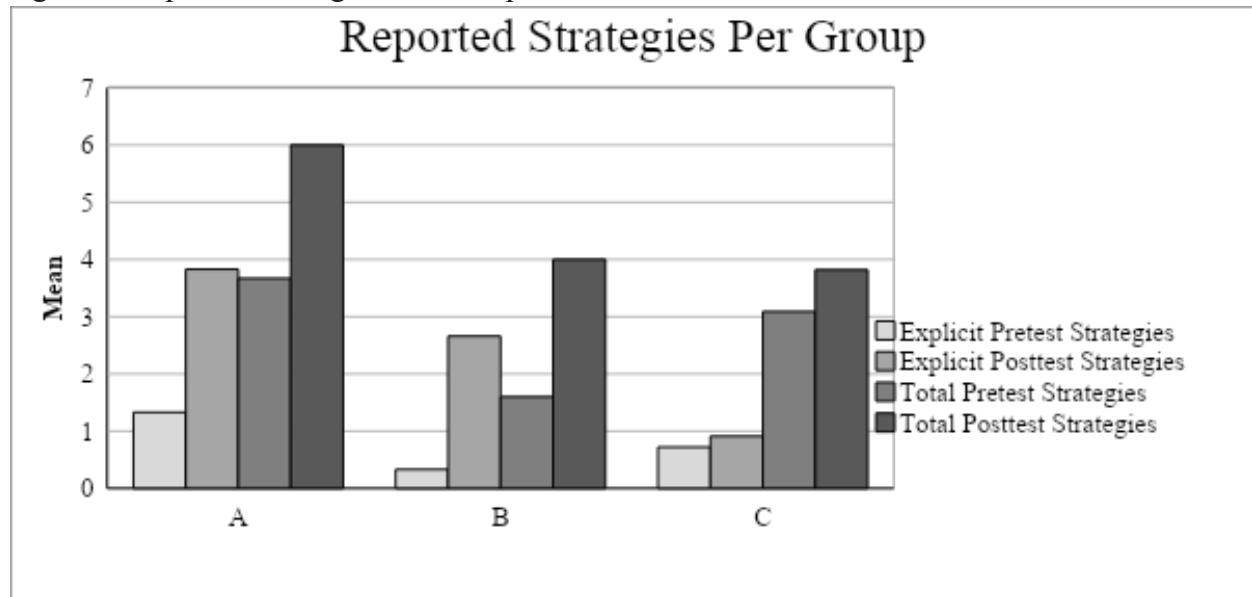
Table 8: Response Analysis

Table 8 <i>Response Analysis</i>									
	Treatment A			Late Treatment B			Control C		
	Prettest	Posttes t	%	Prettest	Posttes t	%	Prettest	Posttes t	%
Sample size n	6			3			11		
1. Explicit strategies	8	23	187.5	1	8	700	8	10	25



reported									
2. Mean explicit strategies reported per person	1.33	3.83	-	0.33	2.66		0.72	0.91	
3. Explicit strategies represented	6	8	33.3	1	8	700	4	5	25
4. Total strategies reported	22	36	63	5	12	140	34	42	23.5
5. Mean total strategies reported per person	3.67	6	-	1.6	4		3.09	3.82	
6. Total strategies represented	13	15	15.4	4	12	200	15	18	20

Figure 2: Reported Strategies Per Group



As can be inferred from the table above, of the sample size of 20 participants, there is an increase in strategies from pretest to posttest for all areas tracked. However, the percent increase for both treatment groups was far higher than for the control group. Both treatment groups showed improvement in reporting explicit strategies between pre and posttests, with Treatment A increasing from eight instances to 23, and Late Treatment B increasing from one to eight instances. Control C showed a slight increase, from eight instances to ten. Similar results are

found when comparing the mean number of explicit strategies reported per group per test. Treatment A increased from identifying only one explicit strategy in the pretest to almost four strategies on the posttest, Late Treatment B produced one strategy among the three of them during the pretest, but were able to produce eight strategies in the posttest. Control C began identifying eight explicit strategies, and ended producing 10 strategies.

Likewise, similar results can be seen when reviewing the percent increase from posttest to pretest across groups. A lower percentage increase is seen for the total strategies represented for both Treatment A and Control C. This may be due to the already high number of strategies identified, especially when compared to the four identified strategies of Late Treatment B.

Another analysis these data help to determine is whether the hypothesis (H3: over a week, 50% of the information presented from social media will be retained and applied in a test scenario) was supported or not. When looking at the group as a whole, both Treatment A and Late Treatment B collectively identified all eight explicit strategies at the time of the posttest. At an individual level, Treatment A reported an average of 3.83 explicit strategies per person at the time of the posttest, which equates to individuals retaining about 47% of the total number of explicit strategies when exposed to content daily. Late Treatment B reported an average of 2.67 explicit strategies per person at the time of the posttest, which equates to individuals retaining about 33% of the total number of explicit strategies. It is unknown whether these individuals reviewed content daily or not, but the groups' increase in all categories reflected in Table 8, and when compared to the categories of Control C, suggest that individuals in Late Treatment B at least viewed some content at some point before the posttest. As individuals in Late Treatment B exhibited the extremes in data found in this study, specifically different results, an analysis for this group is necessary.



Table 9: Late Treatment B Analysis

Table 9 <i>Late Treatment B Analysis</i>			
	LT1	LT2	LT3
# Explicit Pretest Strategies	0	0	1
# Total Pretest Strategies	1	1	3
# Explicit Posttest Strategies	0	0	8
# Total Posttest Strategies	2	2	8
% Engagement	100	100	0
Role	“Parent with child who never received EI”	“Parent with child who previously received EI”	“None apply”
# Days between Pre & Posttest	15	13	13

### Health Accounts Followed

The number of health accounts was recorded in order to determine if hypothesis (H2: participants who were asked to follow the study Instagram account will increase in the number of health and communication accounts followed a) from pretest to posttest and b) when compared to participants who were not asked to follow the study Instagram account) was supported or not. The number of health accounts an individual followed was recorded at the beginning of the study, more precisely, once the participant followed the study Instagram. The final number of health accounts participants followed was recorded after participants completed the posttest. Of the twenty participants, fourteen were able to be analyzed for the number of health accounts they followed. This is because some of the participants have “private” settings, and despite following the study account, did not allow the study account to follow them. An account was determined to be a health account if at least three of the account’s last five posts presented health information

with the apparent purpose to educate (rather than to sell a product). Therefore, Table 10 below summarizes the participating individuals and the health accounts followed. Data was collected on the total number of followers participants had, in order to analyze trends. However, because of the small sample, no clear patterns emerged relating the number of accounts followed and their likelihood to follow additional accounts, although that pattern may exist.

Table 10: Number of Health Accounts Followed Pre and Posttest

Table 10 <i>Number of Health Accounts Followed Pre and Posttest</i>																	
	Treatment A					Late Treatment B				Control C							
	T2	T4	T5	T6	mean	LT1	LT2	LT3	mean	C2	C3	C4	C6	C7	C8	C1 1	mean
Health Accounts Followed - Pretest	4	14	25	1	11	2	2	0	1.33	0	9	0	4	0	0	0	1.86
Total Accounts Followed - Pretest	39	644	472	453	402	250	509	493	551.3 3	544	278	558	125	274	117	83	282.7
Health Accounts Followed - Posttest	4	<b>15</b>	<b>28</b>	<b>3</b>	<b>12.5</b>	2	2	0	1.33	0	9	0	4	0	0	0	1.86
Total Accounts Followed - Posttest	39	646	483	460	407	252	517	493	417.2 5	547	278	561	125	276	117	83	283.8 6
Number increase	0	<b>1</b>	<b>3</b>	<b>2</b>	<b>1.5</b>	0	0	0	0	0	0	0	0	0	0	0	0
% increase of Health Accounts	0	<b>7.14</b>	<b>12</b>	<b>200</b>	<b>9.09</b>	-	-	-	-	-	-	-	-	-	-	-	-
% increase of total accounts followed	0	<b>0.15</b>	<b>0.5</b>	<b>0.43</b>	<b>0.27</b>	-	-	-	-	-	-	-	-	-	-	-	-

Figure 3: Mean Number of Health Accounts Followed

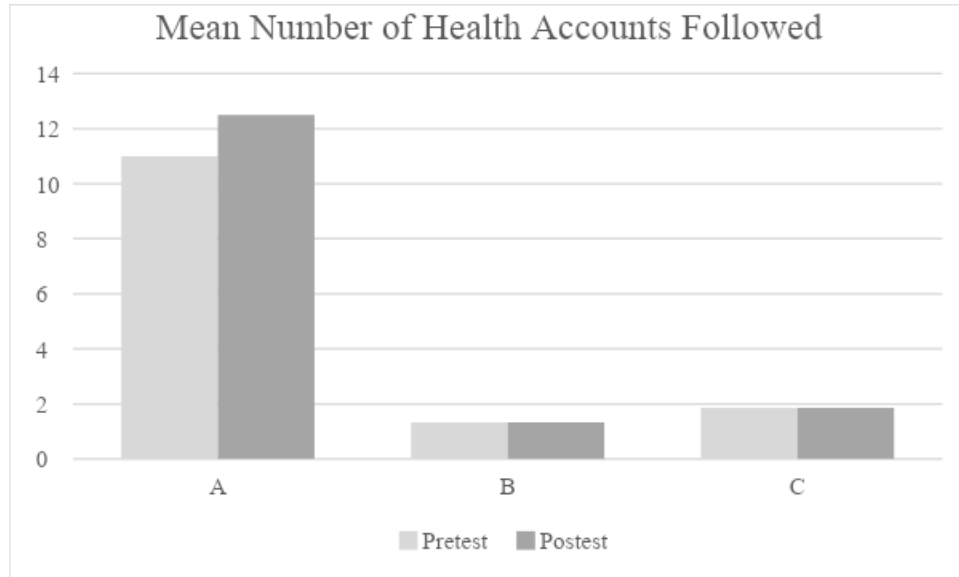
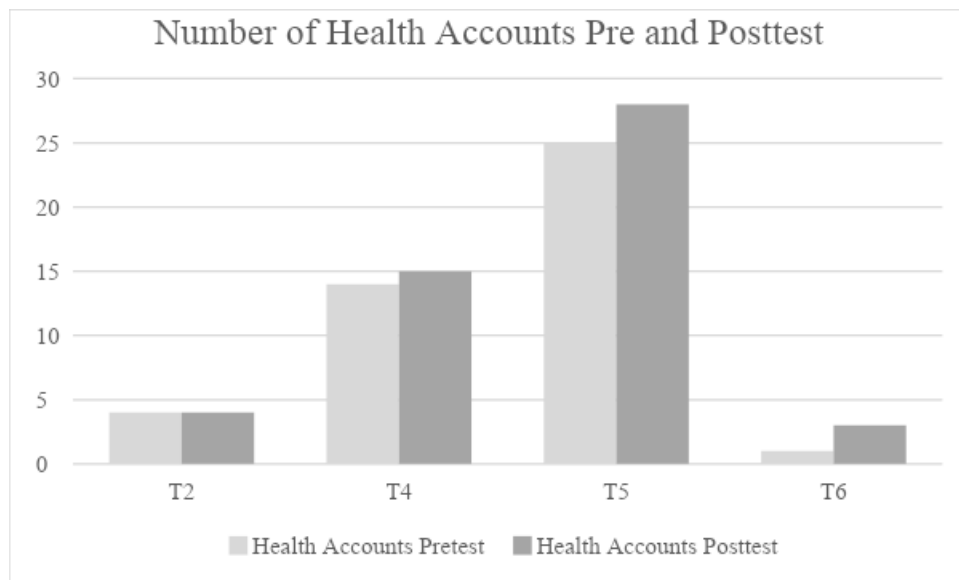


Figure 4: Number of Health Accounts Pre and Posttest



For Treatment A, three of the four participants increased in their number of health accounts, with an increase from the mean of 11 health accounts followed at the time of the pretest to 12.5 accounts followed at the time of the posttest (Figure 3). No additional health accounts were followed in Late Treatment B or Control C at the time of the posttest. However, upon sharing the treatment Instagram with the control group after the completion of the posttest, it was discovered that an individual in the control group began following the study account, as

well as three additional health-related accounts. Likewise, a member in the control group followed an additional animal-smiling account (resembling the control account). These behaviors suggest that some individuals may follow similar content after initial exposure, perhaps if it interests them.

### **Accounts Information**

Information from Instagram was collected to determine content engagement and accessibility for the trainable content. The treatment account had 51 followers at the start of the study, while the control account did not have any. By the end of the study, the treatment account had 76 followers and the control account had 11.

For the treatment account, Instagram provided information regarding *reach*, which is defined by Instagram as the "number of unique accounts that have seen your content on screen at least once," and can be determined for each post (About instagram insights). In the Table 11 below, it can be seen that at the beginning of the study, the account reached 63 individual accounts. As the accounts themselves cannot be verified, it is estimated that many of these were non-participating followers of the account, as only six participating individuals followed the account at the time of its release. After the initial post, reach dropped slowly from mid- to low-twenties. The number of visits means the number of times the account profile was viewed, rather than seeing a post in one's feed. One individual may make up several profile visits. The number of visits the treatment account received was a total of 34 visits and an average of four per day during the original treatment timeline between February 22nd and March 1st. The first post was shared three times, but no new followers were produced, and no shares happened for any other posts.

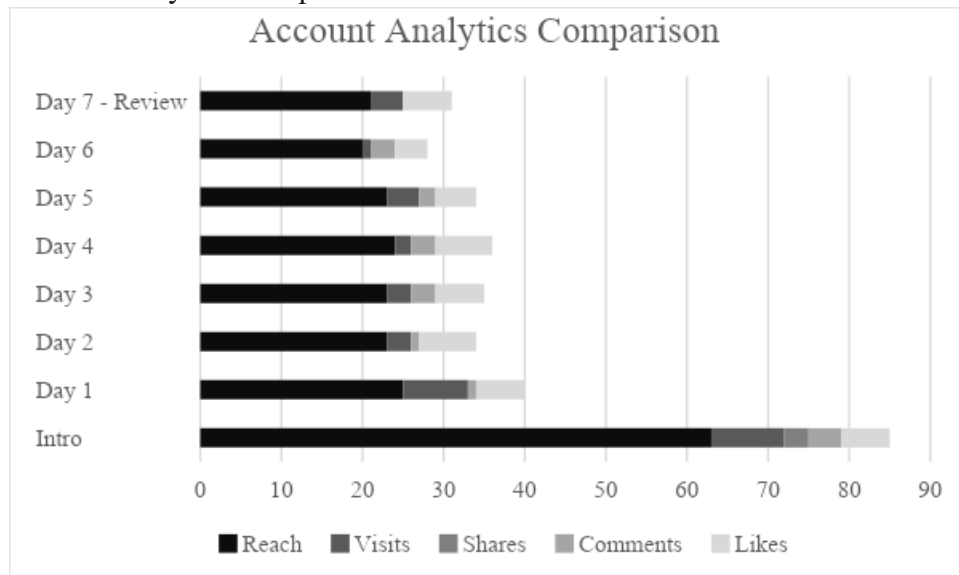
The control Instagram account was not set up as a business account unlike the treatment account, so unfortunately, its reach, number of visits, and shares cannot be ascertained. However, other information regarding the number of likes and comments can be compared to the treatment group. The number of likes on treatment posts totaled to 47 and averaged at about 6 likes per post, with a total of 17 comments and about 2 comments per post on average. The control account totaled to 28 likes for an average of three likes per post, and had no comments on any posts throughout the duration of the study. This demonstrates that the treatment account received more engagement through likes and comments when compared to the control group.



Table 11: Account Analytics Comparison

Table 11 <i>Account Analytics Comparison</i>							
		Treatment					Control
Date	Post	Reach	Visits	Shares	Comments	Likes	Likes
2/22	Intro	63	9	3	4	6	4
2/23	Day 1	25	8	0	1	6	5
2/24	Day 2	23	3	0	1	7	3
2/25	Day 3	23	3	0	3	6	2
2/26	Day 4	24	2	0	3	7	5
2/27	Day 5	23	4	0	2	5	3
2/28	Day 6	20	1	0	3	4	3
3/1	Review	21	4	0	0	6	3
Total		63	34	3	17	47	28
Mean		27.75	4.25	.375	2.12	5.88	3.5

Figure 5: Account Analytics Comparison



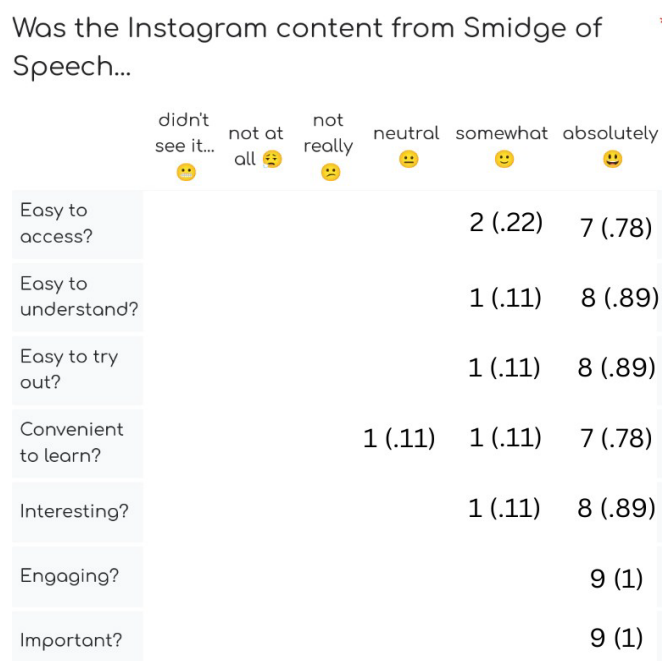
When considering the two treatment groups, both had a 66% participation rate. That is, Treatment Group A had four of six participants like and/or comment at least once, and Late

Treatment Group B had two of three participants like and/or comment at least once. However, Control Group C had a participation rate of 36% (four of 11). Likewise, in Treatment A, two participants left a like and/or comment on every post (33% completely following the direction). Two participants in Late Treatment B also left a like and/or comment on all posts (66%). Control C had two participants who left a like and/or comment on every single post as directed (18%). This further evidences the lesser participation rate for the control group than the treatment groups. Overall, the treatment content received more in total and on average likes and comments, with the most participation from the group who actively sought out the Instagram page (Late Treatment B).

### **Final Questionnaire**

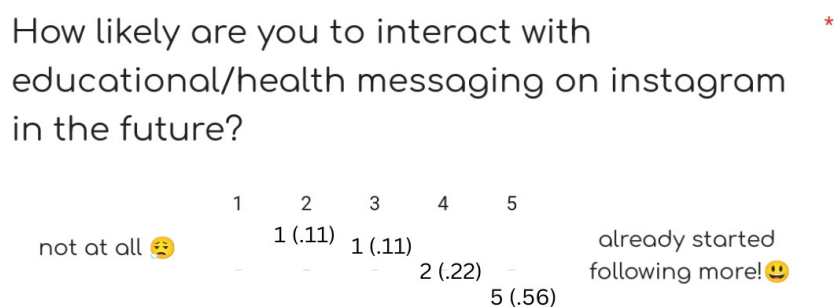
The Google Form for the nine participants in the treatment groups included the posttest measure, as well as a few follow-up questions about participation in the study. The results can be found in Figure 6 below. The first question was a five-point Likert scale that asked, “Was the Instagram content from Smidge of Speech...” and included several items shown in the left column. Each pair represents the number of participants who answered with the pertaining response, followed by the percent of the participants of nine.

Figure 6: Content Feedback



The next five-point Likert scale question asked whether participants are likely to follow more similar health-related accounts or not. Again, the first number is the number of participants, with the percent in parentheses.

Figure 7: Likelihood of Following More Health-related Accounts



The third question was open-ended in order to best gather participants' responses: "How often would you enjoy seeing interesting educational/Health messaging in your feed?" The following responses are summarized in Table 12 below.

Table 12: Preferred Dosage for Health Content

Table 12 <i>Preferred Dosage for Health Content</i>		
Frequency	Participant s	Role
Once per week	1	SLP
Once per day	6	x4 SLPs Parent never received EI None Apply
10 or more times	2	Parent previously received EI Parent currently receiving EI

The final question was also open-ended: “Any suggestions or things you want to share with the researchers?” Six people responded, one saying “none,” so the other five responses are listed below.

Table 13: Suggestions for Researchers

Table 13 <i>Suggestions for Researchers</i>
to make the graphics, colors and lay out more soothing and calming.
Only thing is to slow down the videos. Sometimes [it's] hard to read everything.
Excellent content! Thank you for your work!!
Providing a video modeling what should be done
videos were too fast maybe have a picture on the posts in addition to the videos

## Discussion

Despite the benefits of early intervention on communication development, families who need these services often face a number of barriers including lack of time, proximity to and availability of providers. Therefore, there is a need for providers to consider alternative ways to reach families with young children with disabilities and to better examine the effectiveness of these alternative models. To date, there have been limited studies examining the effectiveness of social media as a way of reaching adults and teaching language facilitation techniques. As a

starting point, this study attempted to follow adults who engaged with a social media account and measure the change in their knowledge in contrast to adults who followed an account with little educational information.

The most significant finding of this study was that knowledge that was shared over social media seemed to have an impact on adult knowledge. The group that benefited the most from the posts was Treatment A, who likely saw posts in their feed daily. The Late Treatment B, demonstrated benefits, but not quite as strong. Both of these groups showed greater change from pre- to posttest than the group who was assigned to the control group. While this study was short-term (only 38 days; with individual participation for eight consecutive days) with few participants, there is some evidence supporting that social media, short bursts of concise information, may influence adult knowledge. It is unknown if this knowledge would be retained and/or influence behavior, but it does provide a starting point and a cause for more investigation.

Additionally, it was found that participants, at least from this sample, did not “follow” directions related to liking media or engaging with the posts. Instagram insights determined that during the original study timeline between February 22nd and March 1st, each post was passively seen in just over twenty feeds per day, and actively sought out in a total of 34 account visits, an average of four per day. It is not known for certain that all participants during the original study release saw all content due to unreliable likes and comments and limitations of Instagram insights. However, there also seemed to be little to no relationship between learning and engagement. Participants did report new strategies in their posttest that were not reported in their pretest. This suggests that perhaps they did view at least the content post for that reported strategy. Further research may be necessary to determine if engagement truly is not indicative of

knowledge for a population, particularly for a group of caregivers in need of services that do not have access.

### **Participation and Engagement**

Insights about participation can be drawn throughout the study. First, based on the small sample of participants, hyperlink was accessed far more than the QR code, and may be more convenient given the context of accessing information for this study. However, most prominently, people did not always do what was asked of them— and that is both expected and okay.

This was first seen in the beginning of the study, when only a small percentage of individuals participated out of a much larger group who was invited (Table 2). A key factor that appears to be associated with initial participation and low attrition throughout the duration of the study is familiarity with the researcher. This is important because it exhibits that familiarity with a client may encourage their participation in treatment via social media. However, the motivation of the targeted population's participation in actual treatment (i.e., the benefit of that treatment rather than helping a colleague), may be different than the motivation of individuals participating in this study. Further research may be to determine participation in treatment through social media of caregivers and providers only who qualify for early intervention services (adding exclusionary criteria for SLPs and SLP students).

The next time this behavior was seen was through the lack of likes and comments for all participants, despite being explicitly instructed to do so. This direction was included to verify that individuals saw each and every content post, as each post is a strategy that could be reported on the posttest. However, due to the low level of likes and comments left on posts, it cannot reliably be used to determine if and when participants saw content. The treatment groups did

engage at higher rates than the control group, as measured by the number of times individuals left a like and/or comment at least once over the course of the study, as well as the number of individuals who completely followed the direction to leave a like and/or comment on all content posts. Despite Late Treatment B having the highest engagement rate of the groups and also the highest percent increase from pretest to posttest compared to the other groups, it is not hypothesized that the latter resulted in the former. This was determined through an analysis of the individuals in Late Treatment B, where the two in this group who participated at 100% actually did not identify any explicit strategies for the posttest (see Table 9).

Based on the data collected for the study, using the measure of leaving a like and/or comment to ensure participants saw the content was unexpectedly not reliable. The individual in this group who never left a like or comment improved at the posttest to identify all eight explicit strategies. It isn't known why one individual did arguably the best in the study, while the other two had arguably the least improvement for the treatment groups. Perhaps this is due to individual differences: an individual may have more interest or motivation to learn the subject matter, s/he may have a better memory, or any other combination of reasons. Another explanation could be that the higher-scoring individual reviewed content more frequently, more thoughtfully, and/or most recently than those who did not score as well. While the number of days between pre and posttest are comparable, there was not a way to verify that individuals did not access the Instagram account right before or during taking the posttest. However, given the results that most participants improved without getting all explicit strategies suggests that viewing the account just before or during the posttest was not a widely adopted approach. Furthermore, perhaps the individual who scored highest simply reached the upper limit of the range of results.

This demonstrates that as clinicians, supporting “late comers” to information may be indicative of their success. Whether directly reposting content or presenting the same information in new ways, clinicians must be creative on social media to constantly include newcomers.

## Responses

Several figures will be used to guide discussion about responses. Each figure includes similar information, but are sorted to highlight specific trends. The first figure below represents in descending order the highest achieving number of explicit strategies, as associated with group assignment (with T as Treatment A in orange, LT as Late Treatment B in blue, and C as Control C in yellow), as well as exhibit participant role to a child, number of days between pretest and posttest, and percentage of participation.

Figure 8: Highest Number of Explicit vs. Total Posttest Strategies

	Posttest Explicit	Role	# of Days	% Part.		Posttest Total	Role	# of Days	% Part.
LT3	8	None	13	0	LT3	8	None	13	0
T3	5	SLP	8	0	T1	8	SLP	8	25
T1	5	SLP	8	25	T5	7	SLP	12	100
T2	4	SLP	8	12.5	T4	6	Parent currently in EI	19	100
T5	4	SLP	12	100	T3	5	SLP	8	0
T4	3	Parent currently in EI	19	100	T2	5	SLP	8	12.5
T6	2	SLP	13	0	T6	5	SLP	13	0
C2	2	SLP	8	0	C3	5	SLP	8	0
C11	1	Provider	12	100	C5	5	SLP	7	0
C9	1	Provider	20	0	C6	5	SLP	10	0
C10	1	Provider	8	0	C7	5	Parent never in EI	14	75
C3	1	SLP	8	0	C8	5	None	9	0
C5	1	SLP	7	0	C4	5	Parent currently in EI	7	62.5
C6	1	SLP	10	0	C2	4	SLP	8	0
C7	1	Parent never in EI	14	75	C9	3	Provider	20	0
C8	1	None	9	0	C10	3	Provider	8	0
LT1	0	Parent never in EI	15	100	LT1	2	Parent never in EI	15	100
LT2	0	Parent previously in EI	13	100	LT2	2	Parent previously in EI	13	100
C1	0	SLP	9	100	C11	1	Provider	12	100
C4	0	Parent currently in EI	7	62.5	C1	1	SLP	9	100



This figure exhibits that there is no clear relationship between the number of explicit strategies reported and percent of engagement (the number of times a participant left a like and/or comment divided by eight, the total number of post days). There was a slight trend for SLP and SLP students to identify more explicit strategies in the posttest than parents of children currently, previously, or never receiving EI. The most prevalent trend appears to be that those in Treatment A identified more higher numbers of explicit strategies as compared to Late Treatment B and Control C. Finally, it appears as though the least number of days between the pretest and posttest identified the most number of explicit strategies.

Likewise, a trend emerges for those in Treatment A, in which participants identified more of the highest number of strategies than when compared to other groups. Contrary to the loose relationships found for explicit strategies, it appeared as though role to a child, number of days between the pre and posttests, and percent of engagement with the Instagram account did not have an effect. Perhaps this is because creating strategies is a rather subjective experience and is the result of many factors.

Treatment A also showed the highest increase in number and percent for explicit strategies reported from pretest to posttest, as well as highest increase in number and percent for total strategies reported from pretest to posttest.

Figure 9: Posttest Variable Analyses

	Explicit # incr	Role	# of Days	% Part.		Explicit % incr	Role	# of Days	% Part.
LT3	7	None	13	0	LT3	700	None	13	0
T3	5	SLP	8	0	T3	500	SLP	8	0
T1	4	SLP	8	25	T1	400	SLP	8	25
T4	3	Parent currently in EI	19	100	T4	300	Parent currently in EI	19	100
T2	2	SLP	8	12.5	T2	100	SLP	8	12.5
T5	1	SLP	12	100	T5	33	SLP	12	100
LT1	0	Parent never in EI	15	100	LT1	0	Parent never in EI	15	100
LT2	0	Parent previously in EI	13	100	LT2	0	Parent previously in EI	13	100
T6	0	SLP	13	0	T6	0	SLP	13	0

	Total # incr	Role	# of Days	% Part.		Total % incr	Role	# of Days	% Part.
LT3	5	None	13	0	T4	200	Parent currently in EI	19	100
T1	5	SLP	8	25	LT3	167	None	13	0
T4	4	Parent currently in EI	19	100	T1	167	SLP	8	25
T3	2	SLP	8	0	LT1	100	Parent never in EI	15	100
LT1	1	Parent never in EI	15	100	LT2	100	Parent previously in EI	13	100
LT2	1	Parent previously in EI	13	100	T3	67	SLP	8	0
T2	1	SLP	8	12.5	T2	25	SLP	8	12.5
T5	1	SLP	12	100	T6	25	SLP	13	0
T6	1	SLP	13	0	T5	17	SLP	12	100

This would suggest that for most individuals, receiving content passively (i.e., appearing in their feed), and daily from an active Instagram account would be more effective than asking individuals to look through an account retrospectively. However, there may be individual differences, where the latter approach can still be incredibly beneficial. If the study happens to resemble the true population, then about one in three individuals may learn phenomenally this way. This means that, just like any treatment an SLP uses, probing and reflecting on how treatment is administered is necessary. Furthermore, should an SLP not be able to serve a potential client, perhaps referring to a speech-language social media account of their interest is not a bad idea. Overall, the increase in knowledge of communication strategies by participants in the treatment group from pretest to posttest and when compared to the control group is encouraging for continued research.

## **Health Accounts Followed**

It was also found that the number of health-related accounts an individual followed increased for some cases, for a variety of factors not yet known. These results may be explained by a variety of factors. It is possible that because the treatment Instagram account had already followed accounts and had followers, that participants had a specific perception of the account. Perhaps a greater following, and maybe a greater level of engagement on content, would result in more individuals to follow similar accounts and engage with them. It is also possible that some types of content naturally elicit varying levels of engagement. Other factors may be that some individuals follow only a few family and friends socially, and don't want to receive content of this type. Individuals may not want others to see that they follow health-related content, if it contains sensitive information, may be perceived as embarrassing, or may come across negatively due to cultural differences. Further research on analyzing the discovery and growth of access to resources through existing SLP Instagram accounts may prove beneficial.

Another interesting discussion point for further research is how "health account" can be defined. It was explained that for this study, an account was considered a health account if three of the last five posts appeared to be created for the purposes of educating. However, part of what makes social media unique is how it blends social and educational mediums. More and more health accounts resemble "lifestyles" rather than traditional public service announcements. It would be interesting to expand the definition to embody this more social messaging in a future study, and to analyze how exposure impacts behavior.

## **Feedback**

While familiarity with the researcher has been discussed as a benefit for recruitment and low attrition, it may serve as a bias towards higher-rated feedback. With this in mind, it was

pleasing to see that most participants believed the study content was easy to access, easy to understand, easy to try out, convenient to learn, and interesting. The lowest rated score was one participant reported a neutral response for “convenient to learn.” Two categories were unanimous with the highest number on the Likert scale: “Engaging” and “Important.” These results indicate that pursuing additional research on social media treatment efficacy may be beneficial.

The next question asked about dosage. One SLP reported that they would like to see similar content about once per week. The four other SLPs considered once per day, as well as a parent who never received EI and an individual who had no role apply to them. Most excitingly, two parents responded with wanting content ten or more times a day. If this is true, having a desire for health-related content on social media may fulfill an access barrier.

The final question included suggestions for the researcher. Two individuals reported that the videos were presented too fast. Because of the format of the website used to create posts, the remedy to taking away the speed component was making the posts pictures instead of video. However, the decision was made to keep the posts as a video in order to allow dynamic graphics, as the review of the literature indicated. In retrospect, intelligibility should be selected over aesthetic appeal, and therefore pictures over video if limited by speed.

### **Limitations**

The major limitation of this study is its small sample size reducing its ability to represent the targeted population. In part, this limitation was impacted by its convenience sampling for recruitment, and resulted in its lack of demographic diversity through the high level of education most individuals achieved, limited representation for fluent languages, race and ethnicity, the relationship between the participant and the child, and socio-economic status.

On face-value, the age (mean of 33 years old) and sex (a 17:3 female to male ratio) of participants is somewhat consistent with the target population. However, a limitation is the disproportionate representation towards a higher level of education. Because the targeted population of caregivers facing barriers to resources may likely have educational levels lower than that of the sample population, the generalization of results may be limited. Furthermore, individuals in higher education are arguably well-versed in learning and demonstrating knowledge through test scenarios. Research for a truer representation for underserved individuals with a variety of education backgrounds may consider measuring outcomes through a means other than a test scenario (e.g., a video demonstration or verbal discussion). The study sample also resulted in mostly native English speakers (fourteen monolingual English speakers), and few individuals of diverse race and ethnicity who would also qualify for early intervention services. Further research is needed to determine whether similar results can be obtained in a larger sample more demographically diverse and reflective of the target population.

Whether a participant is a parent, caregiver, or SLP or SLP student may have an impact on results, in that they may have different experience with, interest, and motivation to learn from children and the presented content. Half of the participants (10 of the 20) were SLPs and SLP students. Because of this, we believe that the number of strategies that were identified in the pre-test are higher than would be expected for a different population. It may also be argued that the motivation for joining and participating in the study would be different for SLP and SLP students than for a concerned parent or caregiver, and that may result in differences from this study.

Another demographic variable of interest that was not measured in this study for the sake of concision was socio-economic status. This is an important factor, and is known to have an

impact on access to resources. Next steps for research in this area could be to review social media health accounts already in use to seek individuals with a variety of backgrounds.

While access to social media can influence caregiver knowledge, an SLP is most interested in whether that knowledge positively impacts the caregiver's behavior, such that they may apply what they learn when modeling language-rich environments with their children. A study design analyzing caregiver behavior after exposure to social media may be another direction in which to take this study.

### **Conclusion**

Because of the shortage of providers, particularly in rural/remote areas, there is a significant need to explore alternative ways to use technology to support families who have young children with communication delays. The use of social media (in this case, Instagram), may be an asynchronous way to provide families with content and/or supplement the content that is provided during visits. Yet, while social media has become more commonly used by providers in communication sciences and disorders, there have been few studies exploring if this is an effective means of sharing information. This pilot study aimed to provide more information on the effectiveness of social media on adult knowledge of communication facilitation strategies. Based on these results, the individuals who received access to communication-focused content via social media did demonstrate increased knowledge of ways to improve communication in daily environments when compared to those who did not receive access to information via social media. While more research is needed, it is encouraging to conclude that social media may be a viable option for sharing content related to speech-language pathology. It is a unique way to meet clients in a space they already occupy, where many individuals with physical and/or monetary

barriers still have access. Future research should explore the impact of social media content on not only knowledge change but behavior change and retention.

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## Appendices

### Appendix 1: Study Flier



**RESEARCH STUDY**  
**VOLUNTEERS WANTED!**

**PURPOSE:** TO UNDERSTAND IF SOCIAL MEDIA AFFECTS LEARNING

**WHAT?**

- CLICK [THIS SURVEY](#) (OR SCAN BELOW)
- FOLLOW AN INSTAGRAM ACCOUNT EMAILED TO YOU
- COMPLETE A FINAL 5-MINUTE SURVEY IN A WEEK


**WHO?**

- ANYONE >18 YEARS OF AGE WITH AN INSTAGRAM

**WHEN?**

- <3 MINUTES FOR 7 DAYS, ANYTIME BEFORE 3/17/23


**SCAN TO BEGIN** →




**Idaho State University**

FOR MORE INFO,  
CONTACT HEATHER WULFF TULL  
[HEATHERWULFF@ISU.EDU](mailto:HEATHERWULFF@ISU.EDU)  
M.S. STUDENT @ISU, PRINCIPLE INVESTIGATOR

## Appendix 2: Welcome Questionnaire




## Welcome Questionnaire

heatherwulff@isu.edu [Switch account](#)  Draft saved

\* Required

Email \*

Your email

 This is a required question

### Consent

PARTICIPATION IN THIS STUDY IS COMPLETELY SEPARATE FROM COURSE REQUIREMENTS.  
DECLINING TO PARTICIPATE WILL HAVE NO EFFECT ON YOUR GRADE OR YOUR STANDING IN THE  
PROGRAM.



Welcome! This is a study looking at if/how social media affects knowledge of communication with young children.

You will be randomly assigned to one of two groups, each following a specific Instagram account emailed to you upon the completion of this form. Then, there will be a final survey after 7 days. Thank you so much for your participation!!

\*Data from this study may be shared with other researchers to advance science and health. We will remove or code any personal information that could identify you before files are shared with other researchers to ensure that, by current scientific standards and known methods, no one will be able to identify you from the information we share. Despite these measures, we cannot guarantee anonymity of your personal data.

Do you have an Instagram account? \*

- ☒ No
- ☐ Yes, I have 1 account only
- ☐ Yes, I have multiple accounts

Do you view your account(s) at least once per day? \*

- ☒ No
- ☐ Yes

What is your Instagram handle? \*

\*Please use the same handle throughout participation in this study.

Your answer



This is a required question

Next



Page 1 of 3

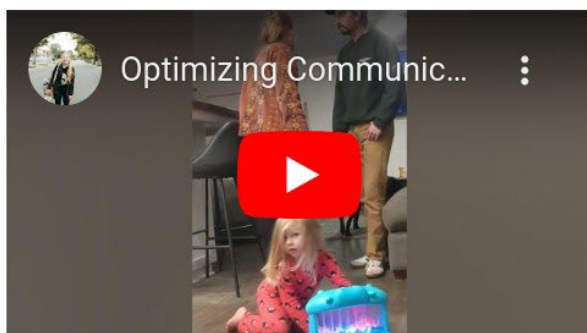
Clear form



## Appendix 3: Pretest Measure

Answer the following as best as you can.

### Optimizing Communication



List ways to optimize communication in the environment presented in the video \*

Your answer

Back

Next

Page 2 of 3

Clear form

## Appendix 4: Demographic Information Questions

## Demographic Information

Age<sup>\*</sup>

Date

mm/dd/yyyy



Sex<sup>\*</sup>

- ☐ Male
- ☐ Female
- ☐ Prefer not to say

Race<sup>\*</sup>

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White
- ☐ Prefer not to say

### Hispanic or Latino? \*

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

### Languages (native, fluent) \*

- ☐ English
- ☐ Spanish
- ☐ Other: \_\_\_\_\_

### Highest level of education \*

- ☐ Some highschool
- ☐ Highschool Diploma/GED
- ☐ Some college
- ☐ Associates degree
- ☐ Bachelor's degree
- ☐ Higher education

What best describes you (select all that apply)  
& your association with a child in early  
intervention (EI)?

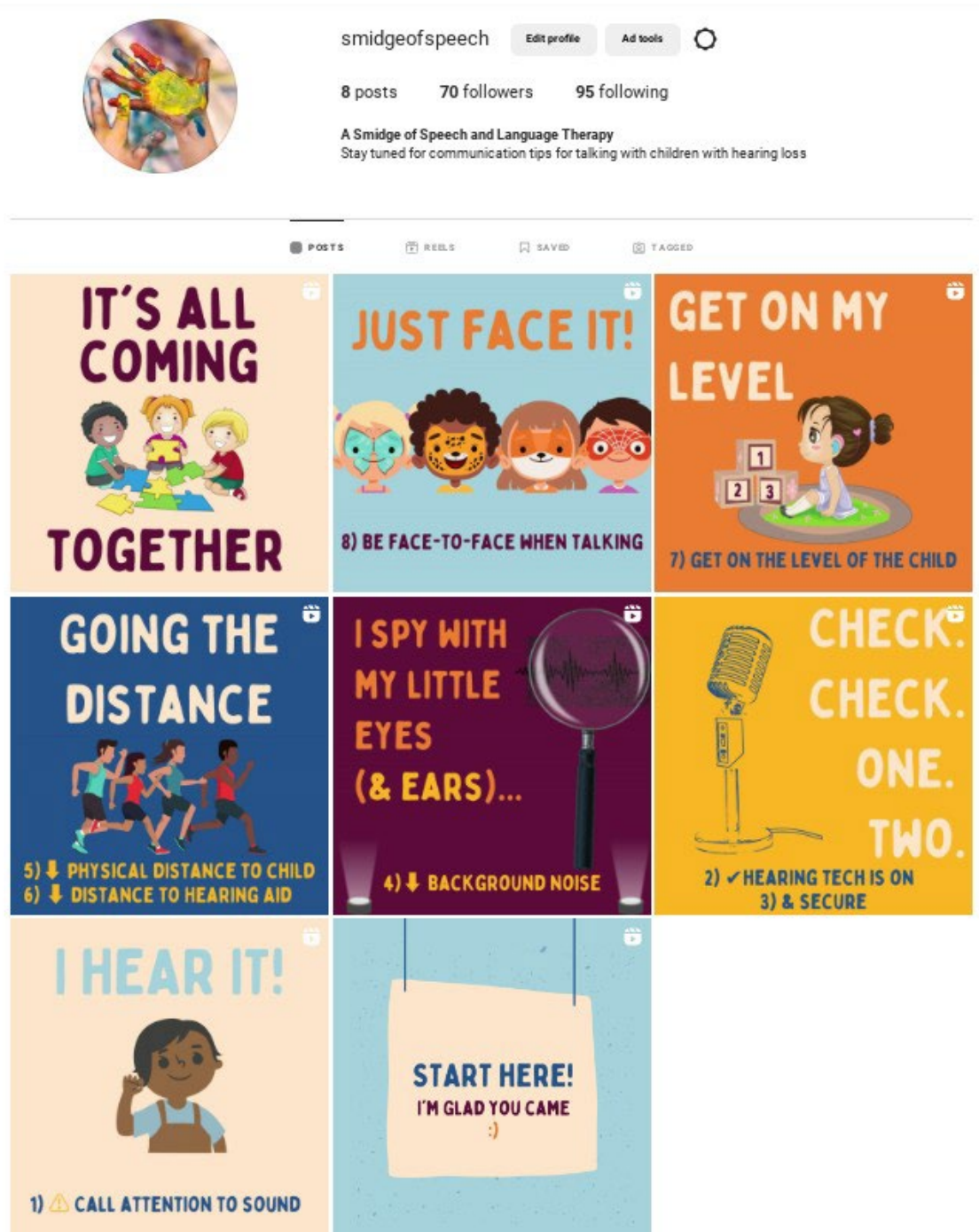
	no association with a child	child never received ei	child previously received ei	child currently receiving ei
parent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other family member	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
care provider	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
early intervention member	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
slp, slp student, slpa, aud, aud student, aa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
none apply to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[Back](#)
[Submit](#)

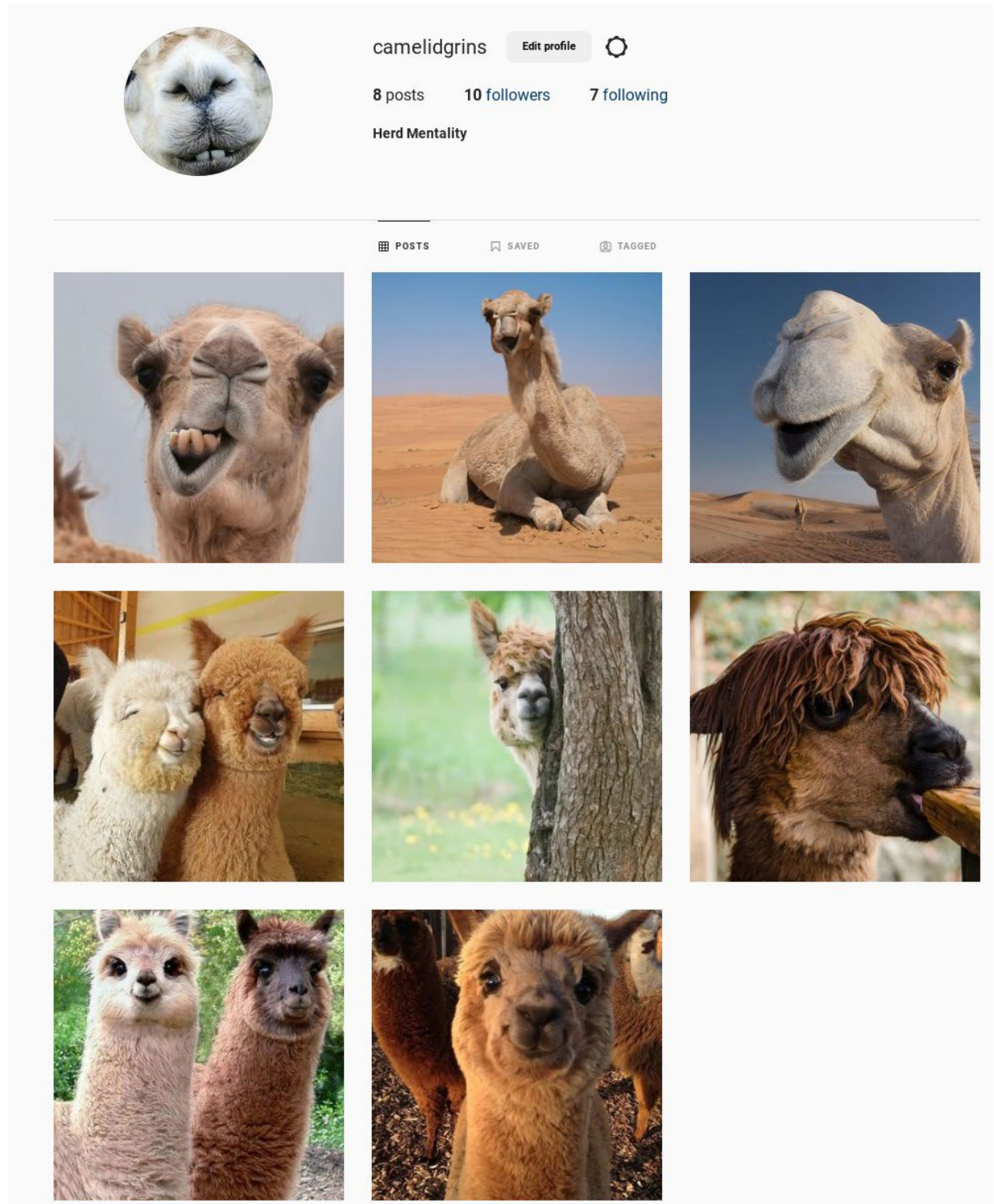
Page 3 of 3

[Clear form](#)

## Appendix 5: Treatment Instagram Page (Post-study)



## Appendix 6: Control Instagram Page (Post-study)





## Appendix 7: Participant Responses

<ol style="list-style-type: none"> <li>1. Get on child's level</li> <li>2. Ensure hearing aid is on and in child's ear</li> <li>3. Turn off television /music</li> <li>4. Bring child closer to speakers</li> <li>5. Face the child and include in conversation</li> <li>6. Include child in conversation by saying things like "look who it is!"</li> </ol>
1. giving Stacy her hearing aid. 2. Finding a better fit for Stacy's hearing aid.
<ol style="list-style-type: none"> <li>1. Talk to the child, not about the child</li> <li>2. Include the child in conversation</li> <li>3. Don't move away from and isolate the child</li> <li>4. Put the hearing back in :)</li> </ol>
<ol style="list-style-type: none"> <li>1. Turn down background music</li> <li>2. Get a headband or another "keeper" specifically for hearing aids</li> <li>3. Get HA refitted</li> <li>4. Have Stacy play on floor between people talking, not turned away from adults</li> <li>5. Engaging with Stacy may help, saying "hello, this is my friend Tom", etc., to show Stacy that people are conversing</li> </ol>
Be face to face, reduce background noise, get on their level, reduce distance between child and communication partner, call attention to sound
Communication could have been optimized by replacing the hearing aid, getting it properly fitted, turning off the television to reduce background noise, and addressing the child in conversation.
Decrease overall sound in the room, give Stacey hearing aid and ensure they are working, face child when speaking to them, engage in conversation with them and don't let the toys just entertain them with sounds
decrease the background music, face the child, acknowledge the child and toys
demonstrate attentiveness and acknowledgment that the child is present
Eliminating background noise and distractions (noisy toys if not part of the communication, TV, etc.), putting yourself in the child's view, and ensuring the child has access to sound (ensuring her hearing aids are placed correctly and working).
Ensure child is always wearing hearing aids, engage and include child in convos, reduce background noise, engage the child on their level (standing vs kneeling/sitting)
Face the child and be in close proximity with the hearing aids, reduce other environmental competing noises and engage.

get on same level as child, use hearing aid, do not have loud music playing
get on the same level, minimize distance to child and/or hearing tech, hearing tech is on and secure, call attention to what is being said, eliminate background noise, be face to face with the child
Give the child her hearing aid Invite the child into conversation Asking the child questions about their day or what they are playing with
give the child her hearing aid, speak where the child can read lips (include her), direct conversation towards the child, consider assistive listening devices, consider sign language
Giving little girl attention and putting hearing aid on again
Help the child with their hearing aids When welcoming the other person into the home introduce the child Including the child in the conversation ex “this is what we did today”
Heys, moving to a corner
Include the child in the conversation with a better fitted hearing aid. Less distractions like TV and music
Limit distractions
Limit noise, more eye contact
Look into purchasing hearing aids that won’t fall out of Stacy’s ears. Turn off the music so Stacy can hear the conversation.
Make sure child is using hearing aid and turn off TV or any other sound-making device
Minimize the distractions by turning off the tv & music. Fix the child hearing aid so it fits properly. Include the child the conversation.
One way to optimize communication would be to place the hearing aid back into the ear to the best of your ability, then schedule an appointment to have the hearing aid potentially resized or replaced. This would also be a great opportunity to learn how to properly fit hearing aids if that is the issue. Another way to optimize communication would be to turn off the television. Sometimes background noise can make hearing even more difficult for individuals that are hard of hearing.
Place the hearing aid back in the child so she can be involved in the conversation.
put the dog away, turn off music, turn off fan, turn off TV, give stacy her hearing aid.
Put the hearing aid on, possibly by finding retention methods. Use signs to imlncrease accessibility to communication. Maintain proximity to the child for their access.



Reduce background distraction by turning off music and tv, have the dog play outside while “catching up” on the day, problem-solve to improve the fit of the the hearing aid so that it doesn’t fall out, bring the child with you so she can be involved in the conversation, increase eye contact, and turn off the light & fan unless they are necessary.

Reduce background noise, face communication partner, limit distractions (toys), use vocabulary that is developmentally appropriate for your communication partner

talk with the child, give her the hearing aid

The adults could include the little girl in their conversation.

They could make eye contact with the little girl.

The adults could ask the little girl what she is doing, if she is having fun.

The parents could make eye contact with their child, smile at her, engage her in a conversation.

Turn down, or off, background noise, ask Stacy to wear her hearing aid (maybe the fit needs to be adjusted), and include Stacy in conversations and/or greeting of friends coming over. Maybe orient her to play with her toy facing the people in the room, so she can watch their interactions (and if she had her hearing aid on, catch some conversational words and turn-taking).

Turn off environmental distractions ( Television, fan, music)

Turn off fan, turn off television, limit distractions!

turn off the TV, music and fan.

Turning off TV. Staying in proximity of one another and the child. Having the child wear their hearing aids. Being within the child's visual field. Using intonation to be more interesting.

When communicating with the child, the adults can make sure to 1) be in the same space as the child; 2) get on the child's level (on the floor or in an open area where the child's back is not turned to them); 3) be face-to-face with the child; 4) Turn off background noise (e.g., TV, fan, noisy toy, etc.)