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## **A Cross-Sectional Study of the Portrayal of Childhood Speech Sound Disorder Interventions in YouTube Videos**

This summer, I participated in the Summer Undergraduate Research Fellowship (SURF). The goal of my project was to examine the source, type of intervention, evidence, usability, and actionability of speech sound disorder intervention-related information contained in the top 100 videos directed to families of children seeking speech sound disorder interventions on YouTube. To achieve this, I first gathered the keywords I would be using to search for videos on YouTube. A panel of faculty, students, and clients provided many keywords to use. Unfortunately, when entered into Google Trends, the words produced no results, which indicated a need for professionals to assist their clients with providing relevant keywords to search online. Instead, I used three keywords provided by my mentor. Next, I gathered the top 100 videos about childhood speech sound disorder interventions and recorded the meta-data of each video. Lastly, I coded each video based on the video source, type of intervention, and if it was evidence-based.

I then scored each video using the Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT-AV). This program evaluates the understandability and actionability of videos. Dr. Harn and I utilized the user's guide to become familiar with PEMAT-AV. Then, we evaluated and scored 20 videos about speech sound disorder interventions to calibrate our responses on the PEMAT-AV. The ICC for understandability

and actionability sub-scales were 0.98 and 0.99, respectively, suggesting good inter-rater reliability for PEMAT-AV. Once I finished scoring the 100 videos, statistical analysis was conducted using the IBM SPSS Software Version 24. The Kruskal-Wallis H test was used to examine if the evidence and the PEMAT-AV scores varied across the video source.

**Table 1**

	Mean	SD	Range
Number of views			
Speech-Language Pathologist	24,103	58,487	35 to 333,319
University Student	3,777	5,886	58 to 26,177
Health/SLP Practice Group (n=14 videos)	20,102	65,941	3 to 248,966
SLP Assistant/Parent (n=2 videos)	15,946	19,907	1,870 to 30,032
All	14,843	45,802	3 to 333,319
Video length (min)			
Speech-Language Pathologist	5:57	2:53	1.2 to 13:04
University Student	7:09	2:46	2:17 to 13:05
Health/SLP Practice Group	3:19	1:46	0:47 to 6:07
SLP Assistant/Parent	3:36	0:36	3:11 to 4:02
All	6:02	2:57	0:47 to 13:05
Thumbs-up (Likes)			
Speech-Language Pathologist	279	630	0 to 3,400
University Student	18.8	30.3	0 to 143
Health/SLP Practice Group	64.9	198.7	0 to 753
SLP Assistant/Parent	141	176.7	16 to 266
All	137	431	0 to 3,400
Thumbs-down (Dislikes)			
Speech-Language Pathologist	6.8	15.9	0 to 86
University Student	0.93	1.8	0 to 8
Health/SLP Practice Group	9.3	33.3	0 to 124
SLP Assistant/Parent	9.5	13.4	0 to 19
All	4.72	16.3	0 to 125

Lastly, I recorded my results. Table 1 presents the descriptive data of the popularity-based meta-data for the videos. Of the 100 videos gathered, 42 were made by speech-language pathologists, 42 were made by university students, 14 were made by a health/speech-language pathologist practice group, and 2 were made by an SLP assistant or parent. The three most common interventions seen in the 100 videos gathered were motor-based approaches, the minimal pair approach, and the cycles approach comprising 27%, 21%, and 13% of the videos, respectively. Almost half of the videos developed by speech-language pathologists focused on motor-based approaches for articulation disorders (47.6%). University students developed videos with the most

diversity across approaches when compared to other video sources. Health/SLP practice groups had a considerable portion of their videos (28.6%) fall in the “other” category, which included several lesser-known intervention approaches.

For items within the sub-scale of understandability, the frequency of agree responses were highest for active voice, clarity of purpose, and audio clarity, 100%, 96%, and 93% respectively. Most videos received agree responses for breaking information into short sections (73%), presenting information in a logical sequence (89%), and clarity of text (58%). Most videos received disagree responses for use of informative headers (61%), provision of a summary (95%), use of common language (55%), and use of medical terms (65%). Within the sub-scale of actionability, most videos were rated as disagree. A majority of videos did not identify a minimum of one action the user could take, address the user directly, and did not break down any action into manageable, explicit steps, with 57%, 58%, and 55% respectively.

**Table 2**

Source	Mean	SD	Range
Understandability			
Speech-Language Pathologist	67.3	11.9	30 to 90
University Student	59.6	9.8	30 to 81.8
Health/SLP Practice Group	60.9	13.5	45.5 to 91.7
SLP Assistant/Parent	65	21.2	50 to 80
All	63.1	11.9	30 to 91.7
Actionability			
Speech-Language Pathologist	77.4	36.4	0 to 100
University Student	9.7	17.5	0 to 66.7
Health/SLP Practice Group	42.3	40.4	0 to 100
SLP Assistant/Parent	83.3	23.6	66.7 to 100
All	44.2	43.5	0 to 100

Table 2 presents the descriptive statistics of PEMAT-AV scores across video source categories. The overall mean scores indicate that videos did not reach adequate levels of understandability (i.e., 70% or higher), though SLP-generated videos neared adequate levels. Overall, mean scores indicate that videos did not demonstrate adequate

levels of actionability. However, the SLP-generated videos were indicative of adequate actionability (i.e., 77.4%). The results of the Kruskal-Wallis  $H$  test showed that there is a significant difference in understandability scores between videos from different sources (Chi-square = 11.3,  $p=0.003$ ), but no significant difference in actionability scores between videos from different sources (Chi-square = 48.04,  $p<0.001$ ). The pairwise comparisons of understandability scores with Bonferroni Post Hoc tests showed that SLP videos were significantly more understandable when compared to university student videos ( $p=0.006$ ), but no statistically significant difference was found between SLP and Health/SLP Practice Group ( $p=0.056$ ) and university student and Health/SLP Practice Group ( $p=1$ ) videos. The pairwise comparisons of actionability scores showed that university student videos were significantly less actionable when compared to SLP ( $p<0.001$ ) and Health/SLP Practice Group ( $p=0.047$ ), but no difference between university student and Health/SLP Practice Group ( $p=0.06$ ) videos.

There is opportunity for possible continuation of this project. As I noted earlier, most people do not know effective key terms to use when searching for information on the internet. A deeper analysis of this issue to find a way to solve this problem would be beneficial to both professionals and clients. In addition, the portrayal of many different disorders or interventions on YouTube could be examined similarly using PEMAT-AV.

Before I started my research, my knowledge of speech sound disorders and their interventions was very limited. I had only taken two courses relevant to my major at the time. Reading research papers for my literature review and watching the videos on speech sound disorder interventions helped me gain an understanding of my project, classes I will be taking soon, and what I will be doing in my future career as a speech-language pathologist. After seeing SLPs work in the videos I watched, I now have an interest in working in pediatrics eventually. One skill I acquired from this experience was the ability to recognize high or low levels of understandability and actionability in audiovisual materials. This will be important in the future when I recommend videos for clients to watch. I also gained a better ability to read and comprehend research papers, which is something I found difficult before this summer. I now understand how the papers are organized and the logic that goes behind structuring one. This helped me write and

format my own research paper, which I will be submitting for publication soon. I also recently submitted a proposal to present at the Texas Speech-Language-Hearing Association (TSHA) Convention in February.