The Benefits of Using Educational Videos in American Sign Language in Early Childhood Settings

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ABSTRACT

With the growing acceptance of American Sign Language (ASL) as a true language comes increasing possibility for incorporating it into the classroom, especially for visual learners. While children in general may benefit from ASL, early exposure to ASL is particularly important for Deaf and Hard of Hearing children (D/HH). In this article, we summarize research on the impact of an educational media series in ASL on early language and literacy development, provide research-based strategies for utilizing visual language and visual strategies during literacy activities, and offer recommendations for teachers about incorporating research-tested educational media in the classroom.

Introduction

It is well known that early exposure to both language and literacy is key for children's future success. There is also a growing awareness that children are able to acquire critical skills from various modalities, including pictures, graphics, and print (e.g., New London Group, 1996). Finally, there are many ways in which visual and verbal information can be presented, including during person-to-person interactions as well as through electronic media, such as computers, television, tablets, and cellphones, and more.

Often, when researchers and educators think about literacy and language development, they consider how children learn through sound and spoken language.

However, while some children may rely on sound in order to learn and interact with the world around them, others may rely more on visual ways of communicating. For instance, some researchers are coming to believe that Deaf and Hard of Hearing (D/HH) learners, in particular, benefit not only from visual strategies (e.g., showing print or pictures to supplement discussion), but also from a visual language, such as American Sign Language (ASL) (e.g., Bahan, 2009; Mayberry, 2007). The purpose of this article is to discuss how young D/HH children can develop early language and literacy skills through a visual language and visual language strategies embedded within a research-based educational video series, one that makes connections between American Sign Language (ASL) and printed English. Research results from five studies will be discussed, which will demonstrate how viewing the series can positively impact D/HH children's early language and literacy development. Discussion of the effects will include which language and literacy skills children learn, how and why they learn them, and provide suggestions for how educators can employ these and other strategies to encourage learning for young children, whether through multimedia resources or during read alouds.

Visual Language

Visual languages, such as American Sign Language (ASL), are genuine languages, each with its own grammar and syntax, distinct and separate from English. There are hundreds of sign languages currently used throughout the world. ASL is used throughout the United States and parts of Canada, and as with many other international sign languages, is now widely recognized as a language. For instance, over 160 colleges and universities in the United States now allow students to take ASL to meet the foreign language requirements. Furthermore, elementary and high school programs in almost every state also recognize ASL as a foreign language.

Early Exposure to Visual Language

All children need rich language environments and frequent experiences with language as they acquire language themselves. This seems especially to be the case for children who are at risk for language or literacy struggles, such as deaf children. For instance, deaf children who have early exposure to ASL have reading skills that are on par with their hearing peers (Chamberlain & Mayberry, 2008; Mayberry, 2007; Hoffmeister, 2000). Children can begin to learn sign language as early as six months old and thus can make important gains from early communication interactions with

adults. But few deaf children are born to parents who are fluent in sign language, and therefore these children are not exposed to a fully accessible visual language from birth. In fact, 90% of deaf children are born to hearing parents, and, typically, parents of these children are learning sign language simultaneously with their child (e.g., Lane, Hoffmeister, & Bahan, 1996). As a result, these children often do not have access to fluent models of ASL from birth and may arrive to preschool already far behind their hearing peers with regard to language and literacy skills. This lack of early exposure to ASL may explain why the average deaf child graduates high school at a 4th grade reading level (e.g., Mayberry, 2010; Traxler, 2000). Therefore, a significant concern is how to expose these children to fluent language models from birth.

Fig. 1: Lucy the librarian models ASL and English print simultaneously during a read aloud in, "Our Trip to the Library"

Research on Language, Literacy, and Media

Traditional methods for introducing D/HH children to language and literacy vary drastically. On the one side are researchers, educators, and parents who believe that D/HH children should be introduced to language through an aural/oral approach and often with the help of new medical technologies (i.e., cochlear implants). Proponents of this side of the debate argue that deaf children will succeed in a hearing world only by utilizing oral language, and they focus on therapeutic training to develop listening and spoken language skills during the early childhood years (e.g.,

Svirsky, Robbins, Kirk, Pisoni, & Miyamoto, 2000). They also argue that deaf children learn literacy through sound-based strategies and that only by acquiring oral language will deaf children be able to develop literacy skills (e.g., Desjardin, Ambrose, & Eisenberg, 2009).

However, there is contradictory evidence regarding how deaf children learn to read; recent research indicates that deaf children may not need sound-based strategies to become literate. Therefore, on the other side of the debate are an increasing number of researchers and educators of D/HH support educating D/HH children visually (e.g., Miller & Clark, 2011; Mayberry, del Guidice, & Lieberman, 2011; McQuarrie & Parilla, 2009). Proponents of this perspective see deaf children as members of a minority population with their own language (ASL in the United States) and cultural group (Deaf, with an uppercase d), one that has its own cultural traditions, history, language, and schools. They also believe that deaf children are visual learners by nature (e.g., Bahan, 2009). Therefore, they argue that exposing deaf children from birth to a fully accessible visual language, such as ASL, will promote not only acquisition of a first language (ASL) but also children's acquisition of a second language (here, printed English) (e.g., Mayberry, 2007; 2010; Chamberlain & Mayberry, 2008). Rather than arguing against deaf children learning how to speak, they believe that, for those who might benefit from speech therapy, it should occur outside the regular classroom. This allows the teacher class time to focus on teaching core content and skills. In addition, for children who utilize speech therapy, having a fluent language base (ASL) typically enhances spoken language skills rather than hinders them (e.g., Mayberry, 2010). Proponents of this perspective make a case for educating deaf children through Bilingual-Bicultural methods, which places equal importance on two languages (ASL and printed English) and two cultures (Deaf and Hearing) and promotes strategies that help children make connections between the two languages. The educational video series described in this article is framed by this second perspective.

Sources of Language

Certainly, all children learn language primarily through live interactions—from the adults and other children with whom they interact daily. Traditionally, deaf children with hearing parents have learned ASL through Deaf adults at residential schools for the Deaf (e.g., Lane et al., 1996). However, with more D/HH children being placed in self-contained classrooms or mainstreamed in public schools (as opposed to schools for the Deaf), where the teachers may not be fluent in ASL, there is a greater need for additional sources of fluent language models.

Educational media.

Hearing children have long benefitted from engaging with educational media during the early childhood years, such as watching educational television programs that aim to promote language and literacy skills. Programs like *Sesame Street, Super Why*, and *Between the Lions* have been shown to significantly impact a range of early literacy skills, such as letter recognition, word recognition, phonological awareness, and vocabulary (see Moses, 2008 for review). The intent of these programs is not to replace learning that occurs at home or in school; rather, educational media is typically designed to supplement it. Hearing children have learned early literacy skills from viewing programs on their own as well as when supplemental programming and resources have been integrated into early childhood classrooms (e.g., Penuel et al., 2012).

There has been increasing evidence that deaf children also benefit from educational media. For example, when episodes of *Between the Lions* were supplemented with sign language, deaf children between the ages of 6 and 10 years were able to increase their knowledge of vocabulary (Loeterman, Paul, & Donahue, 2002). In addition, studies with preschool children indicate that videos in sign language used as supplemental tools during shared reading helped build their vocabulary knowledge (Mueller & Hurtig, 2010).

Recently, multiple studies examining an original educational series, *Peter's Picture* (**click here for video**), have shown that when educational programs are presented to preschool D/HH children in ASL[1] they have similar positive effects. In the first study, Golos (2006) examined the extent to which D/HH preschool children visually attended to a 43-minute educational video in ASL. Results revealed that children in fact did attend to the video and did so an average of 84% of the time. Because there was no sound in the video, children's attention was measured by percent of time that their eyes were focused on screen. There have been five subsequent studies, all of which have examined the effects of this series on improving D/HH preschoolers' language and literacy skills with and without teacher mediation (Golos, 2010a; 2010b; Golos & Moses, 2011; 2012; 2013). With each study, we have learned new information about the ways in which D/HH preschoolers interact with educational media and what they learn from their active engagement with it through the behaviors that they displayed during the times in which they watched the videos (see Table 1 for summary of the five studies).

Specifically, children who watched the videos displayed literacy-related behaviors while viewing and showed an increase in targeted ASL and early literacy

skills. These literacy-related behaviors included: interacting with print on screen, sequencing main events along with the characters, predicting what would happen next or the meaning of a new word, making comments or asking questions related to characters or story events. For example, many of the young viewers signed and/or fingerspelled targeted vocabulary words along with the main character when he signed them. In addition, results indicate that deaf preschoolers learned the following language and literacy skills that were targeted in the videos: target vocabulary words (presented in both ASL and printed English), sequencing skills, and knowledge of story elements within the videos.

Although D/HH preschoolers showed these behaviors and learned targeted skills without teacher mediation while viewing the videos, they can learn even more when teachers encourage their interactions (Golos & Moses, 2011). During one study, teachers received training on ways to encourage children's interactions while watching the videos. After viewing one video two times during one week, children learned more targeted vocabulary words and engaged in more literacy-related behaviors than without teachers mediating their viewing.

The extent to which participants across the studies have attended to the videos and engaged in literacy-related behaviors while viewing may be due to both the visual effects (e.g., flashing lights, sparkles, words "magically" disappearing into the hands of characters on screen) and the research-based strategies aimed at attracting and maintaining viewers' attention that were incorporated into the video (see the section, Strategies That Promote Comprehension). What has been particularly interesting is that the D/HH preschoolers, from across the studies, who viewed the videos demonstrated the literacy-related viewing behaviors and an increase in targeted literacy outcomes regardless of their degree of hearing loss, use of amplification (i.e., hearing aids, cochlear implants), or past exposure to ASL (some of whom had little to no previous exposure).

What Is *Peter's Picture*?

Peter's Picture is an educational video series that was developed to provide a curricular resource for preschool deaf children as a supplemental tool to learn language and literacy. In each video of the live-action *Peter's Picture* series, Peter, a "real" (not animated) adult and the main character, takes Rika Roo (his hearing, life-sized raccoon sidekick) and four deaf children on an adventure. Prior to leaving for the adventure, Peter shows the children and Rika Roo what they will see at the special location. During each adventure, Peter takes pictures, and when they return to Peter's

Place, they sequence the pictures, make a book with the pictures and sentences they create together, play a word game, and finally, read their story "aloud" in ASL.

The structure of each video is based on a theme and a targeted letter of the day. Table 2 includes a list of the episodes, the focal letters, and target vocabulary words for each episode, as well as the cultural knowledge highlighted. Table 3 includes the literacy skills and concepts that every episode targets—that is, regardless of the adventure or theme, each episode aims to promote concepts of print, sequencing skills, and so forth.

Recommendations for Viewing Educational Media in the Classroom

As summarized, evidence from research on educational media reveals that D/HH children can learn targeted skills from viewing an educational video series that is presented in ASL and utilizes visual strategies. Viewing behaviors and learning outcomes increased even more when teachers interacted with children during viewings. In addition, although anecdotal, teachers from across the studies indicated that they begin to incorporate such strategies into their daily lessons after viewing the *Peter's Picture* series. This likely helped bridge what children learned through the media materials and what they learned through live interactions.

Another question remains, though: How can teachers use the *Peter's Picture* video series to facilitate children's learning of language and literacy? Each video includes effective strategies highlighted in the research literature: Some strategies were informed by studies of educational television that have successfully promoted hearing children's learning, including those used in *Sesame Street* and *Blue's Clues*, among others. Other strategies were informed by studies of Deaf adults' read-aloud practices with deaf children. These strategies are used repeatedly within each video and in different contexts with positive results.

Should educators use the *Peter's Picture* series, or other educational media, in the classroom, the following research-based strategies help to foster children's ASL and early literacy learning when viewing in the classroom.

View episodes multiple times.

Research shows that D/HH children can benefit from viewing the videos

multiple times, and this aligns with what has been found when hearing children watch programming repeatedly (e.g., Crawley, Anderson, Wilder, Williams, & Santomero, 1999). Results from studies with D/HH children showed that children who viewed the videos two to three times attended to the video an average of 84% of the time, showed an increase in literacy-related behaviors across viewings (Golos, 2006; 2010a; 2010b), and learned targeted vocabulary, story elements, and sequencing skills (Golos, 2010b; Golos & Moses, 2012; see Review of the Literature on Educational Media).

Focus on different skills and concepts during different viewings.

During the first viewing of the teacher mediation study, teachers were asked to have the children watch the video all the way through, without necessarily encouraging interaction, and answer any questions children might have. During subsequent viewings, they explicitly encouraged children to actively engage with the content both during viewings and whenever they paused or stopped the video to pose questions and talk about target content. Educators can replicate successful interactions during video viewings by following these steps:

- Have children watch the video without teacher interaction
- Watch the video again and encourage active engagement
- In subsequent viewings, pause, question, and discuss

Encourage children to interact with print on screen.

As was successful in the mediation study, when a targeted vocabulary word appeared on screen (in print), teachers were asked to pause the video, point to the print, and ask children what the sign for the word was. Teachers were also encouraged to sign or fingerspell the target word and ask the child to point to the correct word on screen. Educators can follow these same procedures when viewing these videos in the classroom.

Encourage children to sign along with the main character.

During each adventure, the main character repeatedly asks the viewing audience to "sign together" or "copy" what he is signing. Children were more likely to sign along when the teacher also encouraged them to do so (Golos & Moses, 2011), and teachers can also encourage this behavior by saying, "Come on, let's all sign it together!"

Provide follow-up activities.

In another study (Golos & Moses, 2013), when teachers were given follow-up lesson activities and materials and instructed to review segments of the videos

and conduct follow-up activities, preliminary evidence showed that children's mean scores increased from pre to post test on the ASL and literacy skills targeted in the videos. After viewing the video one time, participating teachers reviewed specific segments and did a follow-up activity. For example, participants and their teacher viewed the word game segment in the video. During the word game, each (onscreen) child gets one of the targeted words above his/her head. Then, a sentence appears on screen, and Peter asks the viewing audience which of the words (above the character's head) matches a word within a sentence on display nearby.

After viewing this segment, teachers were asked to have children play the same game in the classroom with laminated words and sentences. In another follow-up activity, teachers read "aloud" (in ASL) the same book that the characters create about their adventure at the end of the episode. Having a read "aloud" of the book in the classroom allowed teachers to revisit and repeat focal skills and concepts.

Following up in a classroom could entail these activities: vocabulary matching games (find the targeted word in the sentence); reading aloud the book featured in the videos and/or books related to the theme of the focal adventure; sequencing pictures of main events in the story; signing or fingerspelling target words and having children point to the print or picture.

Additional Effective Strategies to Facilitate Learning

Based on the literature examining Deaf adults' read alouds with deaf children, the following effective strategies were incorporated into *Peter's Picture* and can be used both during read alouds and during viewing of educational videos such as *Peter's Picture*.

Strategies that encourage attention and engagement.

Based on the literature investigating children's attention to and active engagement with educational television programming, the following strategies were incorporated into *Peter's Picture*:

- Ask questions directly to the children and pause after asking each question to give them time to answer. For instance, Peter looks directly at the camera—and thus the viewing audience—to pose questions, pause and wait for a response, then provides the answer (e.g., Crawley et al., 1999).

- Provide a literacy-rich environment. Like a quality classroom, "Peter's Place" is also filled with books, environmental print, and much exposure to language.

Strategies That Promote Comprehension

Make connections between ASL and English print.

During each video, each time a character's name is introduced or targeted vocabulary is signed, the printed word is shown simultaneously (e.g., Mather, 1989; Erting, 2001). In addition, each time a new vocabulary word appears on screen, Peter signs the word, explains what it means and then signs it again, using a "sandwiching" or "chaining" strategy (e.g., Padden & Ramsey, 1998) to connect the sign to the English print. Educators can use these same strategies in the classroom during a read aloud or vocabulary lessons by displaying the English print on a white board or chalkboard while they are signing a new word. After explaining the meaning of the target word, they can point to the word in print, sign the target word, then fingerspell the word, point to the print again and then finally, sign the word again (Padden, 1996; Padden & Ramsey, 1998; Erting, Thumann-Prezioso, & Benedict, 2000; Blumenthal-Kelly, 1995). Whether conducting a read aloud or introducing new vocabulary, teachers should always have both the ASL and English print visible (i.e., all of the children can see the pages) when they are signing.

Provide concrete visual information.

This can include describing in ASL what a word means, showing a picture of the targeted concept, showing the printed version of the target word, as well as what the object is in a real-life context (e.g., field trip). For example, when Peter introduces the word, "pepperoni," the word appears on screen with the picture and print. Peter explains what pepperoni is, and then (using the chaining technique described earlier) he points to the print, signs the word, fingerspells it, and signs the word. Later, viewers see what pepperoni is in a real-life situation when the character Paulie makes a pepperoni pizza.

Fig. 2: Peter provides concrete visual information in, "Our Trip to Paulie's Pizza"

Make connections between the story and children's lives.

For instance, after describing different types of tables where people eat, Peter asks the viewing audience, "What does your kitchen table look like at home?" Educators can make these same connections during a read aloud by asking a question or commenting on the text or picture in the book and connecting it to the children's lives.

Discuss information related to problem solving.

For example, in "Our Trip to Country Bob's Backyard," Rika Roo accidentally lets one of the chickens escape. So Peter asks the viewing audience to help him read signs in the environment to find the chicken's home. After he reads the sign, "Goat Pen" and explains what it means, he asks the audience, "Is that right? Is that the chicken's home?" After pausing to allow viewers to respond, Peter confirms it is not the chicken's home, and the characters proceed with finding the correct home for the chicken and returning it to its home.

Fig. 3: Problem solving ("Do the Chickens live there? Is that right?")

As previously mentioned, teachers can employ each of these strategies with D/HH children both as teachers and their students engage with educational media as well as during read alouds.

Benefits for hearing children?

Results from multiple studies indicate that D/HH children can benefit from exposure to and instruction in a visual language (ASL) as well as visual strategies used during educational media and during read alouds and this may extend to hearing children as well. Although deaf children are by nature visual learners, many hearing children may also benefit when teachers use visual strategies and visual language in the classroom. In fact, some preschools for hearing children already include some type of sign language in classrooms. Incorporating ASL into the hearing classroom may be particularly helpful for children who struggle with language and literacy skills by providing another route to learning certain early literacy skills. A future avenue for research is to study whether and how hearing children learn language and literacy skills from instructional and media materials in ASL. Another question is whether there is a difference between their learning from educational videos in ASL with sound and videos in ASL without sound. It is possible that doing so may help not just in learning the skills targeted in the instruction or materials, but they may also benefit from learning a second language.

If educators want to include ASL into the classroom, the most important thing to remember is to model the language accurately. The best way to model fluent ASL is to invite a Deaf adult who is fluent in ASL into the classroom and/or show educational videos that model fluent ASL. In this way, teachers can learn ASL simultaneously with their students and provide follow-up activities to offer additional learning opportunities. Teachers do not have to know ASL to use the educational videos series. However, to encourage teachers who may be hesitant to use videos that do not have sound, we are in the process of adding voice over and sound effects to the *Peter's Picture* videos (with one video already having sound). With or without sound, there is the potential that hearing children may benefit from teachers incorporating the research-based, effective strategies described in the Recommendations for Viewing Educational Videos section or Additional Effective Strategies to Facilitate Learning section. These can occur either during read alouds or when embedding interactive, educational video viewings into the classroom.

Fig. 4: Expanding on the text during a read aloud

Lessons Learned

An important issue that these studies are examining relates to language and literacy acquisition, and the best ways to promote those skills and knowledge. For deaf children, particularly those who rely little (or not at all) on sound, one effective "route" to language and literacy skills is through visual language (ASL) and visual strategies. When work began on this line of studies, we utilized *Peter's Picture* videos that were filmed in ASL only and not with sound, and deaf preschoolers' attention to the videos and appropriate school behaviors during viewing seemed unaffected by not having sound; they were able to view the videos in the classroom (separated by a divider from non-participants) and seemed to be minimally distracted by other activities and materials in the classroom that might be around them.

However, subsequent work with hearing preschoolers presented a new challenge when participants viewed the video without sound (as opposed to viewing the version with sound, as some hearing participants did). More than with deaf participants, hearing children seemed prone to distractions by sounds in the classroom, such as those related to other children engaging in activities or with materials unrelated to the *Peter's Picture* video. Early on in data collection, this seemed to affect some, though not all, of the hearing participants. As a result, one lesson learned is that when viewing videos without sound, hearing participants will need a viewing environment with fewer distractions. One effective solution in our studies was to ensure that viewing sessions occurred in a quiet room outside of the main classroom.

When considering how this will work in the everyday goings-on of a classroom, the teacher may find a space for viewings outside of her/his classroom, or the teacher can designate a particular area of the classroom as the "viewing area" where other materials (e.g., blocks, manipulatives, art materials, etc.) are not readily accessible. A teacher can also determine a time during which all children have the opportunity to watch the video (and thus, no other activities will be happening at the same time) or small groups can watch (with no sound) while other children engage in lower energy (and quieter) work.

Once all of the videos have sound, teachers may still decide to view the videos without sound some of the time as a way to immerse children in a new language. Whereas other times they may decide to view segments or complete videos with sound to review new concepts.

Conclusion

More and more frequently, teachers and parents are using multimedia resources in educational settings and in the home. Given that the average deaf child graduates high school at a 4th grade reading level, there is a critical need for these children to be introduced to high quality language and literacy experiences throughout the early childhood years. The key is providing early access to a fluent visual language (e.g., American Sign Language for deaf children throughout most of North America) and utilizing visual strategies to facilitate the language and literacy development of visual learners. Read-aloud activities are critical to include daily in the classroom, and using ASL along with visual strategies during these activities may increase children's comprehension as well as help children to make connections between ASL and printed English. The *Peter's Picture* video series is an example of an effective, *supplemental* tool that teachers (and parents) can also use both in school and in the home to help D/HH children acquire these skills and build a strong foundation for literacy learning later on.

Table 1

Summary of Five* Peter's Picture *Studies

AUTHOR (YEAR)	SAMPLE SIZE	VIEWING CONDITION	MEASURES	RESULTS
Golos (2010a)	N = 25 D/HH 3- to 6-year-olds, across 4 programs (3 self-contained, 1 residential)	Participants viewed a 43-minute video in the *Peter's Picture* series three times over one week without adult mediation	Transcriptions: each viewing session was recorded, transcribed and coded for the number of instances of signing of a targeted word, fingerspelling of a targeted word, and conversation related to the video Parent questionnaire: measure of demographic information and information regarding hearing status, services and communication used at home; administered prior to viewing sessions	Descriptive statistics showed the following for 25 participants' viewing behaviors from Viewing Day 1 to Viewing Day 3: • Signing of a targeted word: 287% increase from Day 1 to Day 3 • Fingerspelling of a targeted word: 130% increase from Day 1 to Day 3 • Conversation related to video: 170% increase from Day 1 to Day 3 • Participants in the self-contained classrooms had larger increase from Days 1 to 3, on average, signing more target words than participants in residential classroom

AUTHOR (YEAR)	SAMPLE SIZE	VIEWING CONDITION	MEASURES	RESULTS
Golos (2010b)	Same sample as Golos, 2010a	Same viewing conditions as Golos, 2010a	Peter's Picture Assessment Tool (PPAT): measure of targeted/non-targeted vocabulary through items that asked participants to choose one of four pictures and then one of four printed words to match target sign or fingerspelled word at pretest and posttest Parent questionnaire: same as described in Golos 2010a	Descriptive statistics showed an average increase of 20% across items, from pretest to posttest, on the PPAT Qualitative analysis and descriptive statistics were conducted for four focal participants. Descriptive statistics showed: • Maria (4 years, 11 months; self-contained classroom): 37% increase from pretest to posttest • Greg (5 years, 10 months; self-contained classroom): 14% increase from pretest to posttest • Elisa (6 years, 8 months; residential school): 26% increase from pretest to posttest • Gary (3 years, 3 months; residential school): 24% increase from pretest to posttest

AUTHOR (YEAR)	SAMPLE SIZE	VIEWING CONDITION	MEASURES	RESULTS
Golos and Moses (2011)	N = 3 teachers, 9 D/HH preschoolers (3 to 5 years), across 2 self-contained programs	After receiving training, teachers mediated (encouraged engagement modeled ASL to print connections, etc.) participants' view of one video in the P*eter's Picture* series three times in one week	PPAT: same as described in 2010b Transcriptions: each viewing session was recorded, transcribed, and coded for the number of instances of pointing to the screen, signing of a targeted word, fingerspelling of a targeted word, and additional literacy-related behaviors for teachers and children Parent questionnaire: same as described in 2010a	Descriptive and paired t-tests (note small sample size) showed: • Mean number of instances of signing target words, fingerspelling target words, and additional literacy-related behaviors increased from Day 1 to Day 2, Day 2 to Day 3 and Day 1 to Day 3, except for signing target vocabulary from Days 2 to 3 • Students' responses to teachers (during mediation of viewing) increased from Days 1 to 2 by 33.5%, then decreased from Days 2 to 3 by 6% • Significant increase found for signing target vocabulary between Days 1 and 2 • Significant increase found for additional literacy behaviors displayed during viewing from Days 1 to 2 and Days 1 to 3 • Higher mean scores at posttest than pretest, but not significantly different on RDVA Comparing teacher mediation results to the Golos (2010b) sample's results (without teacher mediation), independent t-test showed: • Participants whose teachers mediated their viewing of the video signed and fingerspelled target words significantly more during viewing on Days 1 and 2 than participants without teacher mediation • Participants whose teachers mediated viewing displayed more literacy-related behaviors during viewing on Day 3 than participants without teacher mediation

AUTHOR (YEAR)	SAMPLE SIZE	VIEWING CONDITION	MEASURES	RESULTS
Golos and Moses (in press)	N = 33, 3- to 6-year-old D/HH children	Participants viewed one (of three) videos from the *Peter's Picture* series viewed two times over one week without adult mediation	ASL Receptive Skills Test: measured ASL receptive skills, administered at pretest Expanded PPAT: Modified into DVD format and expanded to measure target vocabulary and knowledge of targeted story elements (main events, characters, sequencing), administered pretest and posttest Parent questionnaire: same as previous studies	Descriptive statistics and repeated measures ANOVAs showed: • Participants' pretest PPAT total score significantly differed from posttest PPAT total score, with mean posttests scores being higher than mean pretest scores • Participants' pretest scores on each subtest significantly differed from posttest subtest scores, with mean posttests scores for each subtest being higher than mean pretest scores • No significant interaction found between baseline ASL scores and PPAT scores

AUTHOR (YEAR)	SAMPLE SIZE	VIEWING CONDITION	MEASURES	RESULTS
Golos and Moses (in preparation)	N = 7 D/HH preschool children and N = 2 teachers (school for the deaf)	Participants viewed one video one time, then with teachers (after having received training), they reviewed five specific segments and did a follow-up activity for each segment over a two-week period of time	Expanded PPAT: same as described in Golos and Moses (in press)	Preliminary results showed: • mean scores for the targeted skills increased from pre- to posttest • trending toward significance, but no significant differences were found between the pretest and posttest PPAT total and subtest scores (note small sample size)

Note: All of these studies were approved by the Human Subjects Committee, and we received signed informed consent from the parents of each participant.

Table 2:

Targeted Skills Within Each Episode

EPISODE	LETTER OF THE DAY	VOCABULARY	CULTURAL KNOWLEDGE
Our Trip to Paulie's Pizza	P	Pizza, cheese, napkin, pepperoni, table	How to get attention
Our Trip to the Library	L	Library, librarian, library card, quiet, borrow	ASL handshapes
Our Trip to Country Bob's Backyard	B	Backyard, egg, goat, chicken, rabbit	How videophones work

Table 3:

Targeted Skills Across Videos

SKILL OR KNOWLEDGE AREA	HOW SKILL OR KNOWLEDGE AREA IS ADDRESSED
Concepts of Print	Asking about and explaining that books have titles, where to start reading, and direction of print
Sequencing	Explicitly sequencing the five main events that take place during each adventure
Vocabulary (related to print)	Asking about, discussing, or explaining the meaning of *title, sentence, page, word, story, book*
Story Elements	Discussing characters (who they are), setting, and solving problems within the plot
Deaf Culture	Demonstrating and discussing turn taking and ways of getting attention; Modeling Deaf characters interacting with each other in ASL and in a Deaf culturally friendly environment. Modeling Deaf characters communicating through videophones

Note

1. At the time of investigations these videos did not have sound.

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