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Evaluation of the effectiveness of using DVDs to elicit language for children who are deaf or hard of hearing

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EVALUATION OF THE EFFECTIVENESS OF USING DVDS TO ELICIT LANGUAGE FOR CHILDREN WHO ARE DEAF OR HARD OF HEARING

by

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Abstract: This study examines the effectiveness of utilizing a DVD software program to teach specific language structures to children who are deaf or hard of hearing. This study includes a literary review of previous studies that evaluated the effectiveness of using technology to teach language to children who exhibited language delays.

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Table of Contents

List of Tables

Review of Literature

Language Development in Children who are Deaf or Hard of Hearing

Children who are prelingually deaf or hard of hearing face several challenges in developing spoken language. Their anatomical structures responsible for hearing have been compromised in some way, thus impacting how sound is received and processed. In turn, their language development is often delayed when compared to normal hearing peers. This is evident in all areas of language, including vocabulary, connected language, and syntactic knowledge (Geers, Moog, Hayes, 2008).

A variety of factors may account for a delay in these areas of language development. First, prelingually deafened children without full access to sound are not able to learn language incidentally, as do children with normal hearing. Children with normal hearing naturally acquire a wealth of vocabulary and language by listening to the world around them. For children who are deaf or hard of hearing, natural incidental learning is compromised due to their hearing loss. Depending on the degree of hearing loss and type of amplification device used, children who are deaf or hard of hearing may miss out on the vocabulary and language spoken around them. If a child is not identified with a hearing loss at an early age, learning language can be compounded by missing out on early access to the sounds of speech necessary for acquiring language.

Second, children who are deaf or hard of hearing may not be able to hear sounds that carry important meaning for speech and language. Morphemes, the smallest meaningful units of speech, are elements that carry important information but are sometimes difficult to hear and produce. For example, high frequency sounds such as /s/ are often used to indicate plurality, such as the /s/ in the word *cats.* Verb tenses, as well, are marked by morpheme markers, such as the –*ed* ending to indicate the past tense form of a verb, as in *walked, jumped,* and *kicked.*

Phonetically, these words *sound* as if they end with the /t/ sound, which is a high frequency sound. Similar to other high frequency sounds such as /s/ and /f/, the high frequency /t/ sound carries important information, but its acoustic characteristics make it difficult to hear. The task of hearing these high frequency sounds can become even more demanding when they occur at the end of a word or sentence. When a person is unable to gain access to these sounds, the meaning of the words is often lost.

The effects of not competently acquiring a spoken language may lead to delays in a child's academic development, most readily leading to delays in written language and reading abilities. These delays tend to increase as content becomes more difficult and a greater demand is placed on comprehension and use of complex sentences and paragraphs (Moog & Geers, 1999). Thus, there is a heightened value placed on formally teaching language to children who are deaf or hard of hearing.

Fortunately, the advent of cochlear implants and improved hearing aids have provided better auditory input, allowing for more successful progress for children who are deaf or hard of hearing in acquiring a spoken language. According to Geers (2002), "spoken language competence is now attainable by many children who previously depended primarily on sign language for communication." Children with prelingual deafness who receive a cochlear implant are able to gain better access to sound, which ultimately aids in their speech perception abilities.

Direct Language Instruction

While cochlear implants and improved hearing aids provide children with better access to sound, studies have shown that a cochlear implant, alone, does not automatically ensure a child will learn how to talk and read. Moog and Geers (1999) reported that with early cochlear implantation (before the age of 5) *and* intensive language instruction in an auditory-oral learning

environment, children demonstrated improvements in all areas measured: speech perception, speech production, language, and reading.

Oral schools for children who are deaf and hard of hearing employ direct language instruction methods because of the advantages this type of instruction provides the students. One advantage of direct instruction, stated by authors Moog and Stein (2008), is that children are provided with opportunities to learn to use spoken language to communicate clearly for a variety of purposes. As proficient English-language users, we sometimes forget the complexity of our native language. In a direct teaching approach, language is broken down into its basic parts (nouns, verbs, pronouns, etc.) and is gradually brought together again through the combination of grammatical elements to create meaningful communication. This allows children to communicate for a variety of intents, such as requesting objects, making statements, asking questions, expressing emotions, conveying information, commenting, and giving directions (Moog & Stein, 2008). Basic communication is only one advantage of utilizing direct instruction. Another benefit is that it allows children who are deaf or hard of hearing to succeed academically. In order to read and write proficiently, a student needs to have a sufficient understanding of the language and its syntactical and morphological elements. When children who are deaf or hard of hearing are directly taught language, they are better equipped with the skills to read and write, thus preparing them for academic success (Moog & Stein, 2008).

Therefore, it is essential to look at the components that comprise direct language instruction and to explore their effectiveness. Oral schools for the deaf teach spoken language in a variety of contexts that span a continuum. At one end, teachers use structured and “repetitive activities to practice a specific target structure,” while at the other end teachers use more natural, conversational-like activities (i.e. cooking, art, show and tell, games) that allow for practice of

"selected targets in a more natural context" (Moog & Stein, 2008). The principles of direct language instruction find their roots in developmentally appropriate practices. Language is best learned when instruction is motivating, child-centered, and naturalistic. Moog and Stein share the following:

> Lessons can look more like conversational activities, and conversational activities often appear to be child directed and very much like real talking. Because these activities are more meaningful and appear to be more child-directed, they are highly motivating, making them effective for learning language (Moog & Stein, 2008).

Language activities are facilitated by the teacher and language targets are selected by the order of expected development. For example, a child understands and uses single words, then progresses to understanding and using short phrases, then sentences, and then several, more complex sentences (Kozak & Brooks, 2001). Within these different language levels, there is an expected order of development of the parts of speech. A teacher working with a lower language level student may begin by targeting single nouns and/or verbs first. A teacher working with a student at the 2-word level may be working on noun + verb combinations. Students at an even higher language level may be working on adding prepositions or prepositional phrases to create noun + verb + prepositional phrase sentences, such as "The dog jumped over the fence." Again, these language structures often need to be directly taught to children who are deaf or hard of hearing because they are unable to incidentally learn language. The goal is to teach children language structures, provide them with practice using the structures in a variety of contexts, and to ultimately enable them to "catch up" to their hearing peers in spoken language development (Moog & Stein, 2008).

During more structured lessons, teachers of children who are deaf and hard of hearing have utilized certain tools in order to teach language. These “traditional” or “conventional” methods include teaching the targeted vocabulary word, concept, or grammatical structure (i.e. pronouns, adverbs, adjectives, verb tense, etc) through the use and interaction of teacher-made as well as commercially available materials such as picture cards, toy objects, books, and games. The actual materials selected largely depends on the age and interests of the students, but they should be motivating, child-centered, and naturalistic, meaning the objects are realistic and presented in contexts in which they would most naturally occur.

Once the materials have been selected, they are often incorporated in a planned, sequential manner. For instance, the teacher may begin by using objects that are concrete, such as a real desk or a toy desk. After the child demonstrates comprehension of the concrete representation of the object, the teacher then moves progressively to representations that are more abstract, such as a picture of a desk. Moving in this progression aids children’s comprehension of language and also helps them to expand their schemas or mental representations for objects and concepts, thus enabling them to understand that a real desk, a toy desk, and a picture of a desk all represent the same concept of “desk,” just in different forms. This approach of progressing from concrete objects to more abstract representations of the objects is grounded in the cognitive stages proposed by Piaget. Piaget theorized that as children age, their cognitive abilities, or the way children understand and assimilate new information, follow a progressive developmental pattern. In the beginning stages a child learns through motor and reflex actions, then develops the ability to use symbols to represent objects, and around first grade is able to think more abstractly. In the final stage, during adolescence, a person is capable of hypothetical and deductive reasoning, a highly developed cognitive skill. Teachers of the deaf

employ Piaget's cognitive model theory when presenting manipulatives and other instruction materials to students in order to capitalize on the appropriate stage of their cognitive development (Piaget, 1983).

In a typical structured language lesson, the teacher might identify the language goal for the week to be the prepositions, "on" and "under." Starting with more concrete materials to teach the prepositions, the teacher may select a toy chair and a toy baby. The teacher then teaches the prepositions by placing the baby on and under the chair, while narrating her actions throughout. After several repetitions the teacher checks for receptive comprehension of the preposition by instructing the child to place the baby "on" or "under" the chair. Once the child demonstrates sufficient receptive comprehension of the language target, the teacher focuses on developing the child's expressive use of the target. For example, the teacher asks the child, "*Where* is the baby?" to which the desired response is, "The baby is *on* the chair," or, "The baby is *under* the chair." Acquiring sufficient comprehension and expressive use of a new language target is a slow, and sometimes laborious, process. A child may require repetitive and multiple exposure to the new target before it is truly mastered. In subsequent lessons the teacher reinforces the students' knowledge of prepositions by repeating the above activity and adding additional objects such as a table, car, a mom, and boy, or by utilizing other materials, both concrete and more abstract. The teacher may take pictures of the children being on and under different objects in the room. In a variation or extension of the same type of activity, the teacher and children may then look at the pictures together whereby the teacher checks for expressive abilities by asking the child to identify where the subject is in each picture. The possibilities which one teacher may choose to teach and reinforce this language structure are numerous; each child is different and each teacher prefers to utilize different materials and a variety of tactics to teach language.

For further practice using the language structures in a more natural context, the teacher may carry out a conversational activity, such as a cooking or art project. Language is not functional for a child if it is only produced as a target in a structured setting. Therefore, extensive carryover and practice in conversational settings is essential to enable the child to use newly learned language structures more automatically as their normal hearing peers do. Children with normal hearing, who continuously and incidentally learn language, do not typically require direct language instruction in order to use language in a variety of settings. Many children who are deaf or hard of hearing, on the other hand, need to be directly taught language and directly trained before they will be able to generalize language structures across multiple contexts for practical use.

Technology and Teaching Language

As the availability of technology has increased, the use of technology for teaching has expanded as well. As in the example above, teachers often use digital cameras that allow them to upload and display pictures instantly. Computers have had a large impact on teaching and learning as well. Students and teachers utilize the many features of software and other programs that allow them to learn information in a new and different way. The internet has opened up a world of possibilities for gaining access to information and can provide teachers and students instant access to images and videos that portray vocabulary and concepts more meaningfully than books or encyclopedias could explain in words and still pictures.

It is important to note that technology can serve different roles in students' learning: students can learn "from" technology or learn "with" technology (Papastergiou, 2009). When learning "from" technology, students utilize computers and other media as a tutor and look to it as a supplementary teacher to learn basic skills and knowledge. Murphy, Penuel, Means, Korbak

& Whaley (2001) describe this type of learning as “discrete educational software (DES) programs, computer-assisted instruction (CAI), and computer-based instruction (CBI)”. Learning “with” technology, on the other hand, involves using technology as a tool to achieve goals in the learning process. Technology, in this role, serves as a “resource to develop higher order thinking, creativity and research skills” (Ringstaff & Kelley, 2002). Teachers have been implementing learning “with” technology more recently as new information and communication devices have become more readily available in schools and as educators have come to recognize the potential learning that can be achieved using technology. While technology is no doubt effective, technology alone does not guarantee learning will take place. Therefore, this study will focus its attention on the potential advantages of learning “with” technology.

Several studies have documented the advantages of incorporating learning “with” technology into regular classroom instruction. Papastergiou (2009) cites the advantages of using online multimedia as a teaching tool. These advantages include: serving diverse learning needs of students, encouraging student interaction through animation, stimulating visual and auditory senses through video and sound, and maintaining student interest by conveying concepts quickly and efficiently (Papastergiou, 2009). The value of stimulating students’ visual and auditory senses may hold particularly interesting benefits for students who are deaf or hard of hearing. By heightening their senses using the elaborate sound and animation of multimedia, teachers may be better able to capture students’ attention, leading to increased learning possibilities.

In addition, Marshall (2002) comments that education technology “complements what a great teacher does naturally,” allowing an educator to utilize traditional methods of instruction while implementing technology as a way to enhance the learning process. In a sense, technology

should not used as an *alternative* to academic instruction, but more so as an additional resource in a teacher's "toolbox" of teaching strategies.

Wilson and Brupbacher (2007) examined the effects of integrating multimedia presentations into lessons developed by classroom teachers. Each multimedia presentation incorporated media, images, music and text in order to examine the possible effects on the students' learning, interest, and motivation to the subject addressed (Wilson & Brupbacher, 2007). Using pre-post content tests and attitude surveys, the findings showed that students demonstrated increased achievement and learning when exposed to the multimedia presentation as compared to students who received traditional methods of instruction alone. In addition, the findings revealed that the integration of multimedia into content lessons "increased their interest and motivation and that it made it easier for them to learn and retain their new knowledge" (Wilson & Brupbacher, 2007).

Roschelle, Pea, Hoadley, Gordin and Means (2000) identified yet another benefit of using technology in learning: the connections of technology to real-world contexts. Textbooks, although periodically updated, are typically unable to keep up with current events as readily as computers and technology. The internet and video images have the capability of exposing students to current events, which helps students become more connected to the world around them.

While these studies focus their attention on the benefit of using technology in the educational setting of normal-developing students, a number of studies focus their attention on using technology to teach language to children who have language delays, much like the language delays which are typical of children who are deaf or hard of hearing.

O'Connor and Schery (1986) assessed how technology influenced the receptive and expressive vocabulary, social, and communication growth of toddlers who were enrolled in early intervention programs. Using a within-subjects design, the researchers compared two treatment conditions, a computer-aided approach and traditional intervention techniques. During the computer-aided treatment session, children were engaged in an "interactive play session focused around the computer and corresponding objects" (O'Connor & Schery, 1986). Children were encouraged to press picture keys that would trigger the computer to verbally label the corresponding picture and would display the coordinating picture on the screen. Following presentation, the interacting adult would supply toy objects that represented each picture on the keys and would encourage the child to play with the toy and to expressively label the toy. During the traditional play treatment session, a graduate speech-language clinician used a set of toys and objects that were motivating to the children. The clinician and child interacted using the toys, while the clinician provided language models and reinforced the child's communicative intents throughout the session.

The children's vocabulary, social, and communication growth were assessed before treatment and after both treatments were administered. Interestingly, O'Connor and Schery (1986) found that, "both interventions yielded positive gains for the children." The computer condition had facilitated language comprehension as effectively as traditional intervention procedures. In addition, the results indicated that the computer-aided approach utilized a software program that, "allowed interactive, developmentally appropriate instruction with a controlled vocabulary" (O'Connor & Schery, 1986). Because both treatments proved to be effective, this study advocates the implementation of both traditional and technology-aided

instruction in the classroom. By using both methods of instruction, teachers can provide varied instruction, increasing students' levels of motivation and attention.

A later study by O'Connor and Schery (1992) also looked at the effectiveness of computer language intervention with children who were severely handicapped and exhibited delays in communication development. Results of this study indicate that subjects "were able to profit from individual, clinician-facilitated computer training to show increased comprehension of specific vocabulary" (Schery & O'Connor, 1992). This study, like the previous study discussed, holds "potential implications for the instructional use of technology in classrooms" (Schery & O'Connor, 1992). The authors proposed several advantages of using computer-based language intervention. First, the computer program sustained the children's interest over a long period of time. Second, the program included several interactive features with the user, making the activity more motivating to the child. Finally, the computer program facilitated positive social/interpersonal skills between the child and the clinician.

A more recent study by Barker (2003) examined the effects of using a computer-vocabulary tutor with 19 elementary students enrolled in an oral school for the deaf. The vocabulary tutor was comprised of three major dimensions: a pictorial component, which displayed line drawings or pictures of the vocabulary words, an audio component in which a computer generated "talking head" verbally labeled the vocabulary items, and a visual written representation of each vocabulary word beneath the picture. Several vocabulary lessons were created, each targeting everyday nouns and actions (i.e. shovel, digging). Each vocabulary lesson consisted of a pretest to assess students' receptive comprehension of the words, presentation of the vocabulary items to associate the visual images of the words with receptive and written language, drill and practice to ensure the child associated words with their images, and a posttest

to assess whether the student should repeat the lesson or move on to the next lesson (Barker, 2003). Four weeks following a completed lesson, the students' retention of the vocabulary items was again assessed using the same post-testing procedure. Production competence was not assessed in this study. The study assessed students' immediate vocabulary acquisition and learning gains over time (retention of the vocabulary items). The results showed that "all but two students experienced an overall gain in vocabulary" (Barker, 2003). Although retest scores of the vocabulary items were significantly lower than post-test scores, the students' overall gain of receptive vocabulary comprehension significantly improved when compared to their baseline scores (Barker, 2003). The results of this study suggest that the computer vocabulary tutor is an effective tool for teaching vocabulary to students who are deaf or hard of hearing.

Purpose

The purpose of this study was to evaluate the effectiveness of utilizing short movie clips to teach language structures to children who are deaf or hard of hearing as compared to traditional language instruction techniques. A total of 20 verbs were selected as components of various language structures: verbs at the single-word level, noun-verb combinations at the two-word level, and noun-present progressive combinations at the three-word level.

This study is an extension from a previous study performed by myself, six other undergraduate students from Truman State University, and faculty mentor Dr. Paula S. Cochran in 2006. This study examined how traditional therapy activities could be enhanced with the addition of sound, music, and action of a DVD under the control of a clinician (Cochran, Lummis, Webb, Lucas, Mortenson, Wenberg, Mueller, & Burrows, 2006). Participants of the study were normal developing preschool students.

Although this previous study was carried out, no official documentation of data was prepared and as such no results or interpretations can be discussed. It is necessary, therefore, for a study such as this to be conducted and for data to be collected. This study will focus its attention on using DVD clips to elicit language from children who are deaf or hard of hearing. There is no current documentation of the effectiveness of using this type of technology to teach language structures to children who are deaf or hard of hearing. Previous studies assessed the effectiveness of other forms of technology, specifically looking at vocabulary growth as opposed to language structures.

Procedures

Subjects

Subjects included 8 children who were deaf or hard of hearing, enrolled in the Central Institute for the Deaf (CID) in St. Louis, Missouri. Table 1 summarizes additional descriptive data for each subject. Three students were enrolled in the Primary Department of the school and 5 were from the Pre-Kindergarten Department. Subjects were within the developmental age range of 3-7 years. The mean age was 4 years, 11 months. Subjects were 2 girls and 6 boys. The primary diagnosis of all subjects was deaf or hard of hearing. The subjects used a variety of amplification devices: 2 were bilaterally aided with hearing aids, 1 was bilaterally fit with cochlear implants, and the remaining 5 were bimodally fit (cochlear implant on one ear, hearing aid on the other). Additional diagnosis and considerations included fine and gross motor delays, visual motor delays, nasal emission, sensory processing dysfunction, paralyzed vocal cord, and possible auditory neuropathy. All of the subjects utilized spoken language as their primary mode of communication. All subjects attended CID's oral program five days a week for a regular school day period. The program's focus is to provide students with intensive speech and language instruction in addition to age-appropriate curriculum content. The children's expressive language levels were identified using teacher reports and previous language assessments. Four subjects were working at the 3-word language level, 3 subjects were working at the 2-word language level, and one subject functioned at the one-word level.

Design and Assessments

Two language treatments conditions, traditional language instruction and DVD-aided instruction, were contrasted using a within-subjects design during a two-week period. This type of design allowed for maximized sensitivity of effects within the small sample size of subjects. A

total of 20 verbs were targeted at three different language levels: the one-word level, noun + verb two-word level, and noun + present progressive three-word level. The verbs were classified into two groups: verbs 1-10 and verbs 11-20 (see Table 3). Each subject received 10-minute language instruction, learning one set of verbs in one of the conditions on a daily basis for 1 week. In the second week, each subject again received daily 10-minute language instruction, this time learning the alternate set of verbs in the opposite condition. The type of presentation was randomized so that half of the subjects received the traditional instruction first and half received the DVD-aided instruction first. Within each treatment condition, the list of verbs (Verbs 1-10 and Verbs 11-20) was also randomized so that half of the subjects receiving traditional instruction were taught Verbs 1-10, while the other half were taught Verbs 11-20. In the same way, half of the subjects receiving DVD-aided instruction were taught Verbs 1-10 while the other half were taught Verbs 11-20. The order was counterbalanced to control for the order effects and possible differential motivation of the two treatments and two sets of verbs targeted (see Table 2).

A standard set of picture cards was used as pre and post test measures to assess the subjects' receptive and expressive knowledge of the verbs prior to the start of instruction and at the end of each week's instruction. To assess receptive comprehension, the teacher presented four different verb cards at a time and provided the appropriate language structure of, "*The boy is running./The boy runs./Run*." The student was expected to point to the corresponding picture, and the teacher recorded the student's response. To assess expressive use of the targets, the teacher presented one card at a time and prompted the subject by asking, "What is the boy/girl doing?" In order to receive full credit for the expressive component, subjects were required to use the correct verb within the targeted length of utterance identified as their functioning

expressive language level prior to beginning treatment (i.e. single word level, 2-word level, or 3-word level).

Students in the traditional setting received instruction with a different set of verb cards while students in the DVD group viewed the verbs on video clips. For the DVD group, use of the pre and post test verb cards allowed for assessment of the subject's ability to carry over knowledge of the clips to still pictures following DVD instruction. In the same way, by using a set of picture cards that were different than the picture cards used for assessment purposes, students receiving the traditional treatment were assessed on their ability to carry over knowledge of one set of picture cards to another. Together, this allowed for more accurate assessment of whether the student had truly learned the verb, rather than simply memorizing the picture. In addition to pre and post-testing using picture cards, expressive use of the verbs of students receiving the DVD-aided treatment was assessed by performing a pre and post-assessment using the video clips. The teacher presented one video clip at a time and prompted the subject by asking, "What is the boy/girl doing?" while each clip played, allowing for comparison of the expressive vocabulary gains of the picture cards versus gains made through DVD aided instruction.

Nature of the Interventions:

Each day, students received 10 minute sessions of individual language instruction in one of the two treatment conditions, traditional or DVD-aided, following the predetermined protocol. Initially, sessions were conducted in available classrooms within the school. However, most sessions were conducted in a school faculty member's office, where distractions and noise were minimized. All sessions were video-taped using a Sony SR 10 camera in order to allow for careful review and observation of the two treatments.

The DVD-integrated condition utilized a software tool called BookMark DVD, which was developed by the University of Virginia. BookMark DVD is a simple web-based utility that can be accessed through www.primaryaccess.org/dvd/ (Ferster, 2005). This tool allows a user to select and save portions of video on a DVD disc and play them back on a computer. All DVD movie clips can be saved as a Word file and can be copied and pasted into the BookMark DVD program. The desired DVD disc must be inserted into the disc drive in order for the movie clips to be played back. This legalizes the use of the program and its features. Also, the computer must have Windows Media Player and Internet Explorer to utilize the program.

For this study, Disney movies *Cinderella* and *Aladdin* were played on a Dell laptop computer. In preparation for the study, a total of 20 movie clips that most accurately represented the 20 targeted verbs were selected, clipped, and saved into a Word document. Verbs 1-10 were selected using the movie Cinderella and verbs 11-20 were selected from the movie Aladdin (see Table 3). Each movie clip was 5-10 seconds in length.

In the DVD-aided sessions, the DVD movie clips along with manipulatives and games were utilized to teach the targeted verbs. On Day 1 of DVD-aided treatment, baseline data of the subjects' receptive comprehension and expressive use of the verbs were collected using a set of picture cards. Baseline data of the subject's expressive use of the verbs was collected by presenting each video clip and asking the student, "What is the boy/girl doing?" On Day 2 of DVD-aided treatment the teacher presented and taught each verb and language structure (at the one, two, or three-word level) using the DVD movie clips and toy manipulatives. The teacher pointed out the verb that was depicted while the DVD clip was playing: "Look! The boy is jumping./The boy jumps./Jump." The teacher continued this process for all movie clips, repeating each clip two times during the session. The same procedure was followed using the toy

manipulatives, with the teacher narrating her actions and encouraging the student to manipulate the toys as well. The teacher prompted production of the verb target during the manipulative portion by asking the subject, “Tell me. What is the boy/girl doing?” If an incorrect or incomplete response was given, a correct model was provided, and the student was required to attempt an imitation of the correct target. On Days 3 and 4 of DVD-aided treatment the teacher presented each movie clip and verbally labeled what was happening in each clip. Then the teacher presented each clip a second time in randomized order and asked the student, “What is the boy/girl doing?” Again, the teacher provided models of the correct target if an incorrect or incomplete response was given, and the student was required to attempt to imitate the correct target. The teacher provided verbal reinforcement when the subject correctly identified and produced the expected target by saying, “Good job! The boy is jumping./The boy jumps./Jump.” On Day 5 of DVD-aided treatment, the teacher collected post-test data of the subjects’ receptive and expressive abilities using the picture cards and DVD movie clips. The procedural guidelines of the DVD-aided treatment are outlined in Table 4.

In the traditional sessions, a variety of methods that teachers of the deaf “traditionally” use when teaching new language structures and/or new vocabulary were employed. On Day 1 of traditional treatment, the teacher established the subject’s baseline knowledge of the verb targets using a standard set of picture cards. As in the DVD group, cards were presented in sets of four and the student’s task was to point to the card which corresponded to the verb structure stated by the teacher. On Day 2 of traditional treatment, the examiner presented and taught each verb at the targeted language level (the one, two, or three-word level) using picture cards and toy manipulatives. The picture cards used in this treatment were different than the picture cards used to collect pre and post-test data. The teacher presented each picture card, pointed to the boy/girl

on the card and said, “Look. The girl is washing./The girl washes./Wash.” This process was repeated twice for each of the 10 picture cards. A similar procedure was followed using the toy manipulatives. The examiner prompted production of the verb target during the manipulative portion by asking the student, “Tell me. What is the boy/girl doing?” The examiner provided models of the correct target if an incorrect or incomplete response was given, and required the student to attempt an imitation of the correct target. On Days 3 and 4 of the traditional treatment, the teacher and student played a game in which the 10 picture cards used on Day 2 were taped to paper lunch bags. The teacher placed the bags in a row in front of the child, verbally identifying the action for each picture. Next, the teacher fanned out a matching set of picture cards and instructed the student to “Pick a card!” The student picked a card and the teacher prompted the production of the verb by asking, “What is the boy/girl doing?” The teacher provided correct production of the target as necessary and required the student to attempt an imitation of the correct target. Then the student was instructed to “Find the match,” or, “Find the bag with the same picture.” The teacher provided verbal reinforcement when the subject found the matching bag by saying, “Good job! The boy is jumping./The boy jumps./Jump.” On Day 5 of traditional treatment, the teacher collected post-test data of the subjects’ receptive and expressive abilities using the same picture cards that were used to collect pre-test data. The procedural guidelines of the traditional treatment are outlined in Table 4.

Table 1: Descriptive information on subjects

Subject	Age (Year; Month)	Sex	Amplification Device/s	Additional Diagnosis	Expressive Language Level Functioning
CH 1	3; 3	M	Bilateral HA		3-Word
CH 2	3; 1	F	Bilateral CI		3-Word
CH 3	6; 2	M	Bimodal (HA and CI)		3-Word
CH 4	4; 7	M	Bilateral HA	Nasal Emission; Fine and Gross Motor Delays	3-Word
CH 5	4; 4	M	Bimodal (HA and CI)	Fine Motor and Visual Motor Skill Delays, Sensory Processing Dysfunction	2-Word
CH 6	5; 9	M	Bimodal (HA and CI)	Fine Motor Concerns	2-Word
CH 7	7; 4	F	Bimodal (HA and CI)		2-Word
CH 8	4; 8	M	Bimodal (HA and CI)	Possible Auditory Neuropathy, Paralyzed Vocal Cord	Single Word

* HA: Hearing Aids, CI: Cochlear Implant

Table 2: Order of Treatment

Group 1: Noun + Present Progressive	**DVD**	**TRADITIONAL**
CH 1	Week I: Verbs 1-10	Week 2: Verbs 11-20
CH 2	Week 2:Verbs 11-20	Week 1: Verbs 1-10
CH 3	Week 1: Verbs 1-10	Week 2: Verbs 11-20
CH 4	Week 2: Verbs 11-20	Week 1: Verbs 1-10

Group 2: Noun + Verb	**DVD**	**TRADITIONAL**
CH 5	Week 1: V 11-20	Week 2: V 1-10
CH 6	Week 2: V 1-10	Week 1: V 11-20
Ch 7	Week 1: V 11-20	Week 2: V 1-10

Group 3: Single Word Verb	**DVD**	**TRADITIONAL**
CH 8	Week 2: V 1-10	Week 1: V 11-20

Table 3: List of Targeted Verbs

Verbs 1-10:	Verbs 11-20
1. Sleep	**11. Ride**
2. Pour	**12. Jump**
3. Dance	**13. Throw**
4. Wash	**14. Laugh**
5. Cry	**15. Play**
6. Wave	**16. Eat**
7. Run	**17. Hide**
8. Sing	**18. Hug**
9. Read	**19. Sit**
10. Drink	**20. Push**

Table 4: Procedural Guidelines

	Day 1	Day 2	Day 3	Day 4	Day 5
Traditional	Establish baseline with picture cards (set #1).	Teach structure using picture cards (set #2) and manipulatives.	CH practices expressive use of structure using picture card (set #2) game.	Repeat Day 3 procedures.	Post-data collection using picture cards (set #1).
DVD	Establish baseline with picture cards (set #1) and DVD clips.	Teach structure using DVD clips and manipulatives.	CH practices expressive use of structure using DVD clips.	Repeat Day 3 procedures.	Post-data collection using picture cards (set #1) and DVD clips.

Results

Tables 5 and 6 summarize the receptive and expressive gains made by each subject in the two treatment conditions, with respect to the varying language levels. Both conditions yielded receptive and expressive gains, indicating that both traditional language instruction and DVD-aided language instruction provide effective methods of teaching new verbs to children who are deaf or hard of hearing. Overall results, collapsed across all language levels, showed that in traditional instruction students demonstrated an average receptive gain of 1.875 verbs and an expressive gain of 2.625 verbs. In the DVD-aided treatment, the average receptive gain was 2.25 verbs and the average expressive gain was 1.875 verbs.

Within the traditional treatment, the results were varied across language levels. The individual at the single word level demonstrated the largest combined gain, acquiring 3 new verbs receptively and 4 new verbs expressively. The 2-word level group demonstrated the lowest expressive gain with an average of 2 verbs. The 3-word level group demonstrated the lowest average receptive gain of 1 new verb (see Table 5).

The DVD-aided instruction also revealed varying results across language levels. The highest and the lowest language level groups demonstrated the largest receptive gain, each learning an average of 4 new verbs, while the 2-word group showed an average receptive gain of 2 words. The 3-word level group demonstrated the largest expressive gain with an average of 3 new verbs, while the single word level group showed the lowest expressive gain of 1 new verb (see Table 6).

In the DVD-aided instruction, pre and post-test scores using the DVD clips revealed that all students expressively learned at least one of the structures that was presented on the DVD clips. The 3-word language level group showed the greatest gain, averaging 5 new verbs in the

targeted present progressive language structure. At the two-word level an average of 3 new verbs were produced, and at the single word levels a gain of 3 verbs was obtained (see Table 7).

Due to the small size of the sample, it is beneficial to look at individual scores across conditions as well. In traditional instruction, students 1 and 3 showed a receptive gain of zero, while in the DVD-aided instruction, students 3, 4, and 6 scored a receptive gain of zero, and 1 student scored an expressive gain of zero. It must be noted that pretest scores for these students ranged from 8-10, indicating a prior knowledge of many of the verbs. Therefore, it is likely that a ceiling effect occurred.

Table 5: Traditional Instruction Receptive and Expressive Gains (Picture Cards Assessment)

TRADITIONAL: Group 1 3 Word: Noun + Present Progressive							
Subject	**Verb Set**	**Receptive Gain**			**Expressive Gain**		
		Pre	Post	GAIN	Pre	Post	GAIN
CH 1	V 11-20	8	8	0	1	5	4
CH 2	V 1-10	7	9	2	6	10	4
CH 3	V 11-20	9	9	0	7	10	3
CH 4	V 1-10	7	10	3	8	9	1
				1 Avg. Recep.			**3** Avg. Express.

TRADITIONAL: Group 2 2 Word: Noun + Verb							
Subject	**Verb Set**	**Receptive Gain**			**Expressive Gain**		
		Pre	Post	GAIN	Pre	Post	GAIN
CH 5	V 1-10	2	5	3	2	3	1
CH 6	V 11-20	4	7	3	3	5	2
CH 7	V 1-10	6	7	1	2	4	2
				2 Avg. Recep.			**2** Avg. Express.

TRADITIONAL: Group 3 Single Word Verb							
Subject	**Verb Set**	**Receptive Gain**			**Expressive Gain**		
		Pre	Post	GAIN	Pre	Post	GAIN
CH 8	V 11-20	3	6	3	1	5	4

Table 6: DVD-Aided Instruction Receptive and Expressive Gains (Picture Cards Assessment)

DVD: Group 1 3 Word: Noun + Present Progressive							
Subject	**Verb Set**	**Receptive Gain**			**Expressive Gain**		
		Pre	Post	GAIN	Pre	Post	GAIN
CH 1	V 1-10	6	10	4	7	10	3
CH 2	V 11-20	6	10	4	5	8	3
CH 3	V 1-10	10	10	0	6	6	0
CH 4	V 11-20	10	10	0	5	8	3
				4 Avg. Recep.			**3** Avg. Express.

DVD: Group 2 2 Word: Noun + Verb							
Subject	**Verb Set**	**Receptive Gain**			**Expressive Gain**		
		Pre	Post	GAIN	Pre	Post	GAIN
CH 5	V 11-20	3	6	3	1	4	3
CH 6	V 1-10	9	9	0	5	6	1
CH 7	V 11-20	7	10	3	3	4	1
				2 Avg. Recep.			**2** Avg. Express.

DVD: Group 3 Single Word Verb							
Subject	**Verb Set**	**Receptive Gain**			**Expressive Gain**		
		Pre	Post	GAIN	Pre	Post	GAIN
CH 8	V 1-10	2	6	4	1	2	1

Table 7: Expressive DVD Gains (Using DVD Clips)

EXPRESSIVE DVD GAINS Group 1: 3-Word Level			
SUBJECT	PRE-TEST	POST-TEST	GAIN
CH 1	1	5	4
CH 2	2	9	7
CH 3	4	9	5
CH 4	3	7	4
			5 (Avg.)

EXPRESSIVE DVD GAINS Group 2: 2-Word Level			
SUBJECT	PRE-TEST	POST-TEST	GAIN
CH 5	1	6	5
CH 6	2	5	3
CH 7	2	3	1
			3 (Avg.)

EXPRESSIVE DVD GAINS Group 3: Single-Verb Level			
SUBJECT	PRE-TEST	POST-TEST	GAIN
CH 8	1	4	3

Discussion

These results suggest that the DVD-aided instruction is an effective means of explicitly teaching new verbs to students who are deaf or hard of hearing. The results comparing the receptive and expressive verb gains with respect to the varying language levels hold interesting implications. The lowest language level group, producing only single words, demonstrated the largest receptive and expressive gains in the traditional instruction. While post-test results showed that the student was able to learn 3 verbs when presented on the DVD clips, only one new verb was produced for the post-test using vocabulary cards. This suggests that traditional forms of instruction for children at the one-word level may be a more effective approach to teaching verbs when traditional methods are also used for assessment. Traditional methods of instruction utilize concrete representation through picture cards and perhaps children at the single-word level require more concrete representation of verbs. Or, perhaps students at the one-word level may require a certain baseline level of vocabulary and language as a prerequisite for language learning to occur through other methods of instruction. It is a more demanding task for students to understand that the verb “jump” depicted on a movie clip and “jump” depicted through a still picture represent the same verb. It may be necessary for students to be functioning at a higher language level to perform this type of generalization.

The highest language level group at the 3-word level demonstrated the largest average receptive and expressive gains in the DVD-aided treatment, suggesting that DVD-aided instruction may be an effective approach to teaching verbs for this group. Perhaps children at a higher language level can learn verbs through more abstract representations, such as through animated movie clips that incorporate movement and sound, and are better able to generalize knowledge of verbs from DVDs to still pictures.

Another possible explanation of the highest language group's performance in the DVD-aided instruction is that DVD-aided instruction more closely approximates incidental language learning opportunities than do still pictures. Movies incorporate a multitude of components, including animated movement, music, and voices, which altogether provide more information to the viewer. Although the DVDs used in this study specifically targeted verbs, they naturally lend themselves to additional language learning. Perhaps students at a higher language level are more capable of learning through more natural language learning and are capable of using all of the information provided by the animation and sound of a movie to learn new vocabulary and language. Students at the one and two-word level may be over stimulated by the additional information provided by movies or may be unable to identify the moving clip as representing a single concept. If this is the case, students at lower language levels may learn more efficiently from still pictures where there is less information to gather and process.

It is interesting to note the less measurable results of the two treatment conditions and their implications for methods of instruction. After reviewing the sessions that were video-taped throughout the study, an observable increase in motivation was evident for students in the DVD-aided treatment. Students in the DVD-aided treatment also exhibited increased attention to the activity when watching the movie clips. With regard to the traditional treatment, students showed less attentiveness and motivation to perform the task. During traditional treatment sessions, the teacher redirected students' focus more often than in DVD-aided treatment session. This implies that the addition of DVD-aided instruction could serve as a motivating and interesting activity for teachers to utilize during vocabulary and language instruction.

It was also noted that students across all language levels showed an increased eagerness to participate during DVD-aided instruction. After one day of exposure to DVD-aided

instruction, students arrived with noticeable excitement and anticipation and were eager to watch the movie. For example, CH 2, CH 3, and CH 4, at the 3-word level, and who were able to use language more spontaneously, would ask “Movie?” and/or “Watch movie?” several times throughout the DVD-aided instruction period. Ch 5 at the 2-word level and CH 8 at the single-word level often pointed to the computer with an expectant look, regardless of which type of instruction they received, demonstrating an interest in using the computer and DVD activity.

A disadvantage of the DVD tool, however, is the amount of preparation time required to clip and save the DVD clips prior to a lesson. On average, it took about 1-2 hours per movie to view, clip, and save 10 movie clips. This time may vary depending on the teacher’s familiarity with the DVD being used, as well as their level of familiarity with the DVD bookmarking tool itself. Although the DVD-aided activities were motivating for students, it does require an additional amount of preparation time, which should be considered when planning for a lesson. It is advantageous to note, however, that once movie clips have been saved, they can be reused as often as the user desires. This feature allows teachers to reuse the DVD tool time and again without damage that hard copy products are susceptible to.

Another shortcoming of utilizing technology as part of instruction is the potential malfunctions that can occur with equipment. The DVD tool requires the computer to have internet access capabilities as well as Windows Media Player. Without the essential hardware, software, and consistent and reliable internet access, using the DVD tool can be a cumbersome activity. Likewise, any damage to the DVD itself, such as scratches on the disc, will disrupt the playback features and, in turn, the flow of the lesson.

Limitation of the Study

One weakness of this study is the small sample size of students; therefore, it is difficult to make generalizations from the data collected. Another weakness of this study is the limited length of instruction with each student. Students received 10-minute instructional sessions for 1 week for each set of verbs. This limited length of time for instruction was restrictive in the student's learning and retention of the verbs. In a more realistic classroom setting, teachers would teach new verbs in a time frame beneficial for the students, individualizing instruction by spending additional time teaching more difficult verbs and repeating lessons as necessary. Due to the time limitations of the study, I was only afforded a two-week time period of collecting data and therefore could only employ 1-week of exposure and instruction for each set of verbs.

It would be advantageous to perform a similar study, allowing for longer periods of instruction of the verbs in both conditions, in order to gain more accurate data regarding students' learning progress. It would also be interesting to perform a similar study and to re-assess students' receptive and expressive retention of the verbs several weeks after the treatment conditions terminated. Again, the limited time frame of this study restricted my ability to collect retention data at a later time.

A final weakness of this study is the means of assessment tools utilized. The picture cards that were used to collect pre and post receptive and expressive data were not norm-referenced with any other group of students. Therefore, it was unknown whether the cards were an accurate representation of the targeted verbs. For example, several students were unable to discriminate the difference between the picture of "The boy singing" and of "The boy dancing." It would be beneficial, in future studies, to utilize an alternate means of assessment that is norm-referenced. The assessment tool and record-keeping procedures utilized in this study were also limiting in

that they did not account for students' unintelligible responses. The students' responses were rated on a more subjective scale, rather than an objective scale. Therefore, students' responses were more susceptible to personal interpretations and judgments.

Implications for Practice

This study contributes valuable information for teachers when planning language instruction for students who are deaf or hard of hearing. It evaluates the effectiveness of an alternative approach to language instruction. Ultimately, the goal of the study was to investigate the effectiveness of alternative educational tools to use with students who are deaf or hard of hearing. The results of the study suggest that the DVD bookmarking software can be utilized as an additional teaching tool. Although this study specifically evaluated the ability to effectively teach verbs through DVD-aided instruction, it would be interesting to evaluate the program's effectiveness for teaching other language structures and components, such as prepositional phrases, direct and indirect discourse, and other verb forms such as past tense.

It is essential that when utilizing this program the lesson should be facilitated and guided by the teacher. Although the program would be equally entertaining for the student to simply watch the different movie clips with or without a teacher, the instructional component is the responsibility of the assisting teacher. The teacher can provide the necessary language input for each DVD clip and can also provide the necessary prompts to elicit the student's expressive use of the language target.

The original developers of the DVD bookmarking software have yet to expand upon their initial project. It would be beneficial for teachers and other users of the software to expand its use across a multitude of other DVDs. This study specifically evaluated the effectiveness of DVD-aided instruction using the movies *Aladdin* and *Cinderella.* Because students have no doubt been exposed to numerous movies, it would be beneficial to incorporate movies into lessons that appeal to the student's interests. Or, perhaps the teacher could incorporate DVDs that revolve around the thematic unit of the week. This would provide students with a multitude

of exposures while utilizing a multisensory approach to learning, both of which are effective approaches of instruction for students who are deaf or hard of hearing.

In the future, this project could be expanded to be used at home, with parents serving as the facilitating teacher. Although it would require some training for parents to become familiar with the program, it would be yet another way parents could become more involved in their child's life and language learning progress.

In this study, all DVD-aided instruction was facilitated by playing the DVDs on a laptop computer. This allowed the teacher to control the DVD playback features and for the students to be close to the screen, allowing for clear visual and enhanced auditory input. Although this setup was beneficial in an individual instructional setting, future research should examine the effectiveness of utilizing DVD-aided instruction using interactive whiteboard technology. Perhaps the larger screen and interactive capabilities of this kind of technology would lend itself to effective group DVD-aided instruction.

The DVD tool may also hold interesting implications for use with older students. Although this study focused on using DVD-aided instruction with younger students who were functioning at lower language levels, it would be interesting to conduct a follow-up study, examining the effectiveness of DVD-aided instruction with older students functioning at higher language levels. With older students, the DVD tool could be used to work on predicting skills, cause and effect relationships, and other higher-order language skills.

Future research examining the effectiveness of DVD-aided instruction could also be beneficial by helping to identify students who may benefit from DVD-aided instruction and/or students who still require traditional methods of instruction. Identification procedures could possibly be used in conjunction with other test results, such as standardized receptive and

expressive language assessments, to determine which instruction type would best serve a particular student. By identifying which types of students can benefit from DVD-aided instruction, teachers can provide language instruction through more effective means to their students.

Traditional language instruction has served, and will continue to serve, as an effective approach to teaching language to students who are deaf or hard of hearing. Although no type of instruction or educational tool will serve as the panacea of language instruction, DVD-aided instruction using the DVD bookmarking tool may be an effective way to increase vocabulary and language for some children in oral-deaf education settings while increasing student's attention and motivation to instruction activities.

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