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# Recall and comprehension of signs by high school ASL students: A Study of two movie formats for an online lexical database

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Recall and Comprehension of Signs by High School ASL Students:  
A Study of Two Movie Formats for an Online Lexical Database

MSSE Master's Project

Submitted to the Faculty  
Of the Master of Science Program in Secondary Education  
Of Students who are Deaf or Hard of Hearing

National Technical Institute for the Deaf  
ROCHESTER INSTITUTE OF TECHNOLOGY

By

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Rochester, New York

May 19, 2007

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Student Signature

In Partial Fulfillment of the Requirements  
For the Degree of Master of Science

Approved:

Harry Lang

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(Project Advisor)

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## Abstract

### *Recall and Comprehension of Signs by High School ASL Students: A Study of Two Movie Formats for an Online Lexical Database*

This study compared two technical sign movie formats, Quicktime (2D) and three-dimensional animations (3D) and examined recall, comprehension, and rehearsal time of signs. There was no significant difference found between the formats for comprehension and recall. However, for rehearsal the high school students had significantly higher sign production scores after viewing 2D signs as compared to 3D signs. In addition, there was a significant difference found relating to gender. Girls scored significantly higher on all three measures, regardless of the movie format. In addition, students with more than two years experience with ASL scored significantly higher than those with less than two years on both recall and comprehension using both movie formats. Implications of these findings will be discussed in this paper.

## **Introduction**

There are numerous products marketed toward the education field of American Sign Language (ASL) instruction, although few of the products are based on educational research. Few research studies have addressed whether or not these products enhance learning. The purpose of this study is to compare two technical sign movie formats, Quicktime and three-dimensional (3D) animations in terms of their potential as resources for ASL vocabulary learning. High School students who participated in this study learned signs through both formats and their recall, comprehension and rehearsal time were measured. The results of this project will add to the base of knowledge in providing effective instructional media for ASL learners.

## Literature Review

In recent years American Sign Language (ASL) has become an increasingly popular language used in the United States. According to a survey conducted by the Modern Language Association of America in 2002, more than 60,000 students registered for ASL as a foreign language, a 432 % increase from 1998 making ASL the fastest growing foreign language (Hoover, 2003). The reason for the recent popularity of ASL is unknown. However, an article in *USA Today* speculates that the language is appealing to the new generation of visual learners, stating, “ASL is a natural for MTV-raised teens, many of whom learn visually” (Toppo, 2002). In addition, it is also likely that mass media, including television, motion pictures, and theatre, have increased awareness and interest in ASL in the general public.

In the wake of the high demand for ASL, changes would need to be made to ensure the quality of language instruction is upheld. Along with adjustments comes various standards and rules that need to be established. The most significant adjustment that needs to be made is the recognition of ASL as a foreign language on the state level. In order for states to officially recognize American Sign Language as a foreign language, courses should be based on meeting the accepted linguistic criteria to qualify it as a legitimate language. That is, a language should have a system of arbitrary symbols, grammatical signals and syntax, and a community of users and it has undergone historical changes. States must pass laws on an individual basis to recognize ASL as a foreign language, thereby stating the legitimacy of the language and approve it to satisfy credit towards a foreign language requirement. Gallaudet University, which is one on the leading universities for deaf and hard of hearing people in the U.S., has compiled a list of

states that recognize the legitimacy of ASL and approve it to satisfy credit towards a foreign language requirement. As of September 2006, there was a total of forty states that recognize ASL as a foreign language (Gallaudet, 2006). While this is truly a milestone for ASL, there are other factors that need to be considered as instruction of this language expands.

A main concern for many Culturally Deaf people is the quality of language being upheld. Due to the high demand for ASL to be offered, many school districts, colleges and universities hire people who are available, but may not be experts in the content (Loux, 1996). This creates a large field of unqualified ASL teachers, which in effect can jeopardize the language. Since the recognition of ASL is somewhat recent, many states are just beginning to establish ASL teacher requirements. According to the American Sign Language Teachers Association (ALSTA), there are currently 11 states in the U.S that require ASL teachers to be certified (Jacobowitz, 2004). For this reason there are numerous implications for those aspiring to, or are currently teaching ASL.

More important to the present study, teachers of ASL often struggle with the curriculum, teaching, methods and resources. For the most part, a standard curriculum is nonexistent. There is a series of ASL instructional books, *Vista's Signing Naturally*, which is popular. However, this series was developed before ASL was offered in a high school setting and is therefore geared towards older students, primarily those on the college level. The pace and make up of the curriculum is inappropriate for high school students and the material needs modifications to fit high school strands.

There are numerous methods of teaching ASL; however there is no one standard. Methods vary from teacher to school. Teachers usually adopt different methods based on

lessons thereby figuring out what works best for them. The Natural Approach (NA) is the basis of another popular ASL instructional book, *Learning American Sign Language* by Tom Humphries and Carol Padden (2004), and is used frequently in the classroom. In this method the target language is used at all times in the classroom thereby creating a total immersion into the language. In addition, everyday situations are carried out so that learners are able to communicate in ASL in a variety of circumstances. “The characteristic of NA which distinguishes it from other language teaching methodologies is the development of linguistic skills in stages” (Terrell, 1986). The first stage is Comprehension which consists of teaching a variety of words and how to use them in a sentence. This is done through activities and visual aids such as pictures and overheads where students learn signs by guessing the meaning of word in the target language. Students are also conditioned to recognizing what signs mean in context. This stage can be problematic for high school students due to their uncertainty of what the word really means. As a result, stage one: Comprehension may become confusion. In the second stage, Early Production, students begin producing signs on their own based on what was taught in stage one. This is accomplished through students responding in yes/no answers, one-word answers, lists of words and short phrases. For example, the student is asked, “is it raining outside today?” And the student will respond with no. The third and final stage is Speech Emergences. At this stage students who have been expected to increase their vocabulary by assuming the meanings of signs should now be able to produce more complex complete sentences including dialogue, discussion and narration. This method is based on assumption and therefore is not appropriate for all levels and lessons. In addition, Humphries and Padden base their instructional books on NA because “lessons

are designed to develop communicative competence, that is, the goal is to be able to interact with ASL users very quickly and in culturally appropriate ways even during the first few weeks of study” (Humphries & Padden, 2004). This is also inappropriate for high school students whose goals are to learn the language, not use it to communicate on a daily basis. For these reason other methods are used in combination, such as the Direct Experience Method (DEM).

DEM is carried out by using the target language, but also allowing some written English, drills which emphasize vocabulary and grammar skills and situations explained in the classroom environment, not real life situations. The DEM approach is characterized by six main principles which include, “1) use of target language/mode of communication; 2) cumulative and sequential structuring of content; 3) receptive skill accompanies expressive skill in learning the language; 4) emphasis on conversational fluency; 5) self-generated language and active student participation; and 6) mastery learning” (Newell, Mallery, Menkis, Holcomb, & Arthur, 1981). The first principle is to use the target language at all times. This is common in most methods of teaching ASL because it allows the students to develop strong receptive skills, however it may foster student frustration at times. The second principle, cumulative and sequential structuring of content crates building blocks for the curriculum. Lessons are well planned out so that the teacher does not use any signs that the students have not been introduced to yet. This ensures students learning and comprehension in addition to easing some of the frustration that comes from only using ASL. The third principle, receptive skill accompanies expressive skill in learning the language, allows the students to develop receptive skills along with expressive skills thereby assisting student’s retention of signs. The fourth principle,

emphasis on conversational fluency, ensures that the teacher will use the target language at a normal pace and will not modify it. This allows students to see the language modeled in its correct form. The fifth principle, self-generated language and active student participation, emphasizes student involvement through responding to the teacher's request or question. The last principle, mastery learning, stresses the importance of student understanding before moving on. If students do not understand what was taught previously they will have a difficult time understanding new material. For this reason vocabulary and grammatical features are taught through a variety of drills which aid students in retaining information.

One thing that all ASL teaching methods have in common is the need for instructional resources. For the most part, resources consist of pictures/drawings, overheads, sign dictionaries, workbooks (which, in some schools, the students are not permitted to write in or take home), and outdated instructional videotapes. Unfortunately, the quality of resources is generally low.

In addition, in this new technological era teachers are also faced with the challenge of integrating technology into their classroom. In recent years new resources are being developed, such as DVD instructional videos, web based lexical dictionaries and interactive sign activities. Sherman and Phyllis Wilcox (2006) identify interactive online activities via computers as having great potential in the ASL classroom. However, these resources are not always based on educational research. Therefore, teachers should be cautious when choosing online options; they must consider the implications of the material they select and predict what the students learning outcome will be.

One online resource that aids in teaching individual signs is the dictionary or lexical database of signs produced as short digital movie clips using such software as QuickTime™ or RealPlayer™. Once the program is installed onto a computer, QuickTime movies can play in their own window. A control bar, located at the bottom of the screen allows you to play, pause or stop the movie at any time. In addition, you can sometimes view the movie frame by frame by pressing the arrow keys. This is especially helpful with teaching individual signs because students can see exactly what motion is being made. The downside to this type of technology is that the image or person signing is flat; therefore the student can only view the person signing from one direction, which is the direction at which the video was recorded.

Another online resource that is becoming increasingly popular in the education of ASL is the use of animations, also known as avatars. These animated characters can take form as a human with different skin, hair, and eye color to match the ethnicity of the student. It can also take the form of a variety of different animals or cartoon characters to appeal to young children. Vcom3D is one of the leading companies that produce avatars. They claim their technology “provides interactive, 3D animated characters that communicate through body language (including gesture, signs, and facial expression), lip-synched speech, and action” (<http://www.vcom3d.com/Profile.htm>). However, there is not yet much educational research to support the use of such products.

According to an informational video produced by Vcom3D, avatars were created to help deaf children learn sign language. Hearing children learn language aurally through a variety of different means, such as listening to their parents, TV and radio. Deaf children on the other hand often struggle with language development, they “have no

role models for signing if their parents are hearing” (Vcom3D, 2000). For this reason, Vcom3D designed programs for deaf children and their hearing families to learn sign language.

Researchers at Purdue University are also working on developing avatars to aid deaf children in the educational field. Since deaf children often struggle with English, their goal is to create programs for different subjects that help deaf students in their native language, sign language. They claim that, “Such a system is an effective teaching tool because it gives the students control over the environment, offers self-paced and repetitive learning, presents concepts in a concrete rather than abstract manner, features an environment that feels safe and, as a game, motivational (Raugust, 2006). While both of these avatar programs are aimed toward deaf students, they can also benefit hearing students learning ASL.

While both QuickTime movies and three dimensional (3D) programs are claimed to be beneficial in an educational perspective, there is little evidence to support the claims. My study will hopefully contribute to this base of knowledge by focusing on comparing the influence of the two movie formats in terms of three measures related to learning: comprehension, recall, and rehearsal time. Gender and experience with ASL are also factors that will be examined.

## **Method**

Three research questions were addressed in this investigation:

1. Is there a difference in high school students’ scores for comprehension, recall, and rehearsal of two-dimensional and three-dimensional signs?

2. Is there a gender difference with regard to comprehension, recall, and rehearsal of two-dimensional and three-dimensional signs?
3. Is there a difference between experienced and inexperienced ASL students with regard to comprehension, recall, and rehearsal of two-dimensional and three-dimensional signs?

### *Participants*

High school students enrolled in American Sign Language (levels one through five) to satisfy the foreign language requirement were invited to participate in this study. The high school is located in a suburb of Rochester, New York. The age range of the high school students is between thirteen to seventeen years old and consists of 19 male and 24 female students. Forty-seven high school students in grades nine through twelve initially volunteered to participate in the study. However, four students were unable to complete the data during the allowed time and were eliminated from the study.

The students signed a consent form (see appendix B); in addition to having a parent/guardian sign a consent form (see appendix C). Students who handed in both forms were permitted to participate in the study.

### *Design*

Sign language programs were set up on each computer in the computer lab located in the library of the high school. There were seven steps the students needed to complete. Each student was given detailed directions explaining each step of the experiment on their form. In addition, the students were assigned student codes (to maintain anonymity) that were labeled on the top of each form. Before they could advance they were instructed to raise their hand and the form was collected and a new one was provided. Each form

coincided with one of the following three experiments. The first form the students were given included a list of animal names and they were asked to identify if they knew the signs for any of the animals by circling it on the form (see appendix D). Table 1 identifies the thirty 2D and 3D animal signs that were used for comprehension, recall and rehearsal.

Table 1. Animal Signs

Comprehension and Recall	Rehearsal
Alligator	Seal
Bat	Sea Lion
Boar	Shark
Dinosaur	Sheep
Dolphin	Shrimp
Eagle	Skunk
Giraffe	Squid
Goat	Swan
Hen	Wolf
Hippopotamus	Zebra
Jellyfish	
Kangaroo	
Lizard	
Octopus	
Parrot	
Penguin	
Porcupine	
Raccoon	
Rhinoceros	
Rooster	

Students were individually placed at computers in the laboratory and separated from one another. The data collection occurred in three phases.

### *Procedure*

#### Experiment 1:

This experiment focused on the student's comprehension of signs. Students were given Form A (see appendix E) and asked to view the twenty animal movies that were

listed. They were told to try and learn the signs as best they can, but not to view each video more than three times. Once they finished viewing all twenty signs they raised their hand and were given Form B (see appendix F). Students were asked to identify various optical illusions so that they were distracted from the signs they had just learned. Students were then given Form C (see appendix G) where they were asked to identify ten of the twenty animal signs they were previously shown by clicking on a specific movie number and writing the animal name on the space provided.

#### Experiment 2:

This experiment focused on the student's ability to accurately recall ten of the twenty animal signs they had studied earlier. Students were given Form D (see appendix H) and a video camera. Students were asked to fingerspell the animal's name listed on the paper and show the sign on camera. If the student wasn't sure of the sign they were asked to sign what they thought it maybe and if they forgot the sign they were asked to sign FORGOT.

#### Experiment 3:

The last experiment focused on the students' rehearsal of ten new animal signs that they were not previously shown. Students were given Form E (see appendix I) and a video camera. Students were asked to fingerspell the animal's name listed on the paper, watch the movie, sign the animal for the camera, watch the movie a second time, sign it a second time, watch the movie a third time and finally sign it a third time. When the students completed this part they were given Form F (see appendix J) and asked to complete the short questionnaire based on their experience.

The objective of the study is to measure the influence of the two movie formats (see appendix E) on three dependent variables: comprehension, recall and rehearsal accuracy. Comprehension was measured as the student's ability to identify signs produced through Quicktime and 3D formats. Students were shown five animal signs randomly chosen in each format (2D and 3D) and their scores reflect the total number of animals correctly identified. Recall was measured as the student's ability to remember signs for specific animals by producing the signs in ASL when given the animal's name. Students were videotaped producing the signs and three experienced signers independently rated each sign. Recall scores are the mean scores of the three raters. Lastly, the rehearsal score for each student is the mean of the three rater's scores of how well the student replicated a sign after viewing it on a computer screen. Five 2D and five 3D signs were included in this part of the study. Again, three experienced signers independently rated each sign on videotape. A questionnaire (see Appendix D) was also completed by each student to determine their opinions and preferences on the formats.

The data were analyzed quantitatively using repeated measures analyses of variance (ANOVA). A separate ANOVA was applied to the data for each of the three dependent measures (comprehension, recall and rehearsal). The independent variables in this study are the two movie formats (within subjects), and gender and the levels of ASL (between subjects). Qualitative data were examined by summarizing responses on the questionnaire completed by each student.

## **Results**

Table 2 shows the mean scores and standard deviations for the 43 high school students' comprehension, recall, and rehearsal of the two-dimensional and three-

dimensional signs. The repeated measures ANOVA revealed no significant difference between the two conditions (2D and 3D) in this study for comprehension and recall. However, a significant main effect was found for rehearsal. The subjects in this study received significantly higher scores in rehearsing 2D signs as compared to 3D signs,  $F(1, 41)=31.89, p=.0001$ .

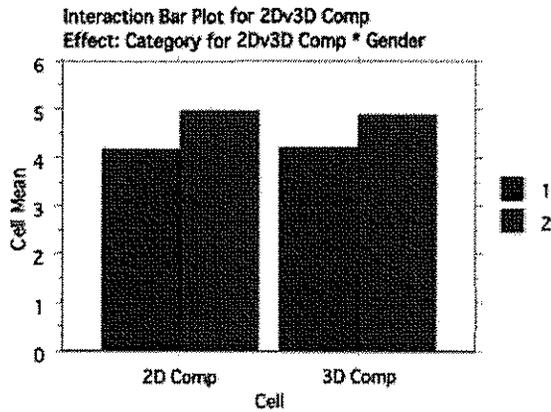
Table 2. Comprehension, Recall and Rehearsal Scores and Standard Deviations

N	Comprehension		Recall		Rehearsal	
	2D	3D	2D	3D	2D	3D
Gender						
M 19	4.16 (1.12)	4.21 (1.23)	3.09 (1.20)	3.14 (1.38)	4.16 (1.12)	4.21 (1.23)
F 24	4.96 (0.20)	4.88 (0.34)	4.09 (0.58)	4.08 (0.49)	4.44 (0.24)	4.19 (0.35)
ASL						
1 <sup>a</sup> 24	4.33 (1.05)	4.42 (1.14)	3.36 (1.22)	3.37 (1.33)	4.31 (0.33)	4.12 (0.28)
2 <sup>b</sup> 19	4.95 (0.23)	4.79 (0.42)	4.02 (0.56)	4.06 (0.44)	4.39 (0.29)	4.07 (0.39)

<sup>a</sup>1-2 years ASL instruction

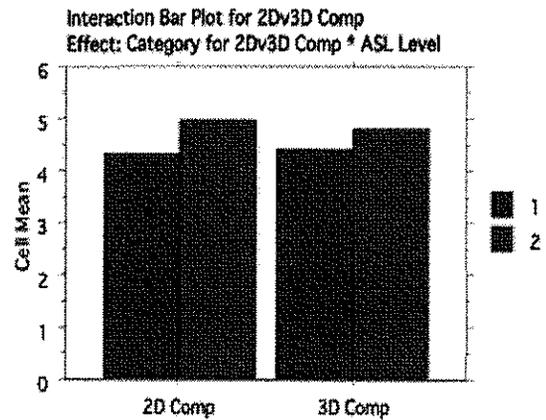
<sup>b</sup>3-5 years ASL instruction

A repeated measures ANOVA indicated a significantly higher mean for girls for comprehension,  $F(1, 41)=11.70, p=.001$ ; recall,  $F(1, 41)=13.44, p=.001$ ; and rehearsal,  $F(1, 41)=6.31, p=.016$ . High school students with more than two years of ASL also had significantly higher scores for comprehension,  $F(1, 41)=4.59, p=.038$ , and recall,  $F(1, 41)=5.74, p=.021$ , but not for rehearsal. Figures 1-6 further illustrate the gender and experience differences found in this study.



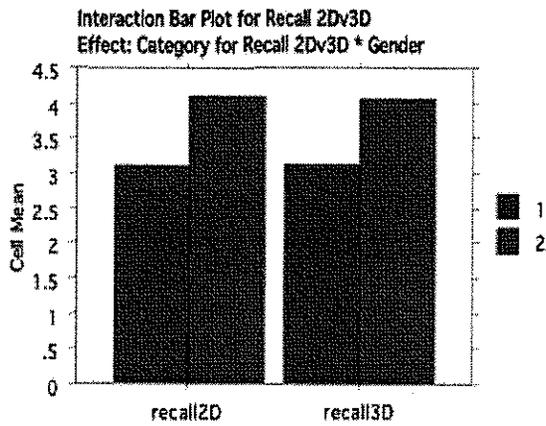
2D v. 3D Comprehension

1- Males  
2- Females



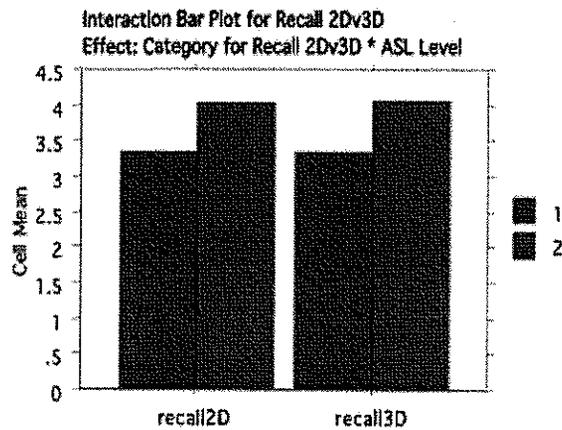
2D v. 3D Comprehension

1- ASL level 1/2  
2- ASL level 3/4/5



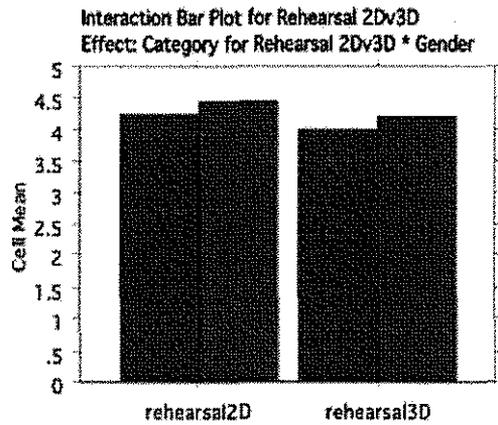
2D v. 3D Recall

1- Males  
2- Females



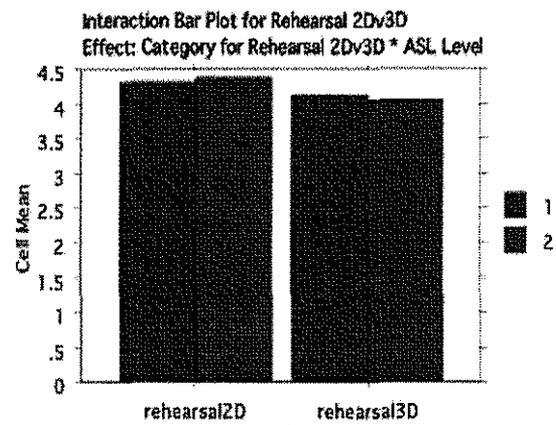
2D v. 3D Recall

1- ASL level 1/2  
2- ASL level 3/4/5



2D v. 3D Rehearsal

1- Males  
2- Females



2D v. 3D Rehearsal

1- ASL level 1/2  
2- ASL level 3/4/5

### Discussion

Research Question 1: Is there a difference in high school students' scores for comprehension, recall, and rehearsal of two-dimensional and three-dimensional signs?

According to the results of the study, there is no significant difference between 2D and 3D movies on the single sign level for recall and comprehension. However, there was a significant difference found in favor of 2D opposed to 3D for rehearsal time. There are numerous implications for ASL teacher as a result of these findings. For one, the research suggests that using 2D or 3D movie formats will not affect the students' comprehension or recall of signs. Therefore, when choosing a resource to use in the classroom teachers may not need to be concerned about choosing one movie format over the other. This broadens the options available to ASL teachers in terms of planning lessons and activities. For example, students will likely comprehend and remember individual signs the same whether through watching an ASL 2D videotape practice or using an online 3D

lexical dictionary. This can create activity options in a classroom such as viewing an ASL video together as a class or setting up individual stations in a computer laboratory.

These results also provide important implications for people who create animations for 3D online lexical dictionaries. For one, creators may note that student's comprehension and recall of single signs do not appear to be affected by the use of animation. However, the present study did not include sentences, and the importance of facial expressions may come into play on that level. Additional research is needed to examine this issue.

The results found in favor of 2D opposed to 3D for rehearsal time pose a potential problem. For ASL teachers, it is important to note that students signing improved using both 2D and 3D rehearsals. However, 2D showed a significantly greater increase of accurate sign production as opposed to 3D. The implication for ASL teachers is that it is important for students to practice signing vocabulary as it is introduced to them because it will improve their production of the sign over a period of time.

Animation creators should take notice of the results in favor of 2D movie formats and examine possible reasons for the loss of accuracy in replicating the signs. This may be a result of the loss of natural movement in the animations as compared to the 2D Quicktime movies with a human signer. As one student noted, "It [3D movie format] was kind of glitchy at times". Another student made a similar comment stating, "It [3D movie format] was a little jerky and slow". Other comments made by students included, "[the 3D movie format were] oddly jointed" and "It was difficult to relate to a 3D figure". For this reason, follow up research is recommended for rehearsal accuracy and animation.

Question 2: Is there a gender difference with regard to comprehension, recall, and rehearsal of two-dimensional and three-dimensional signs?

The results indicated that female students scored significantly higher in both comprehension and recall, as well as notably higher for rehearsal accuracy. These results should be taken into consideration by ASL teachers. It is difficult to determine why male students perform lower than female students. For one, there is a possible lack of instrumental motivation. Male students may not be as motivated to learn ASL as female students are because they do not believe they will benefit from learning the language. For example, female students may consider a career as an interpreter or speech language pathologist where ASL may be used, whereas a male student does not often consider careers in those fields. Another possible reason could be related to integrative motivation. Male students may be less interested in interacting with deaf people or Deaf culture; therefore they may not relate to the language as much. Female students may be more willing to attend Deaf events and social gatherings with the Deaf community, therefore they may benefit from learning the language. These are hypotheses that should be explored through additional research.

Since these findings may imply a motivational issue with male students, ASL teachers should take this information into consideration when creating lesson plans. Female students tend to be self-motivated; therefore male students may benefit from activities that provide them with a purpose. However, due to the lack of research on gender issues relating to ASL learning, the researcher suggests future studies be conducted to provide a more in-depth look at the gender issue.

Question 3: Is there a difference between experienced and inexperienced ASL students with regard to comprehension, recall, and rehearsal of two-dimensional and three-dimensional signs?

The results of the study indicated upper level students are more capable of comprehending and recalling signs than the lower ASL levels. These findings suggest that students who are learning ASL, particularly in the first two years, experience difficulties remembering vocabulary and signs. Upper level students seem to be more capable of remembering word-sign associations. That is, they were more able than lower-level ASL students to see the sign and give the word or see the word and produce the sign accurately. These findings may imply that teachers should take into consideration the difficulty beginning level ASL students have with vocabulary learning and develop different approaches to enhance their ability to recall and comprehend signs. Such strategies may include explaining classifiers or creating associations between vocabulary words and signs. A teacher may also encourage imagery, the creation of a mental picture, to aid students in recalling signs. For example, the sign for DOG is performed by simply snapping your fingers. If the teacher explains to the students that the sign is closely related to calling a dog by snapping your fingers, they may be more inclined to remember it. Upper level students are more experienced with classifiers and may learn to develop their own sense of imagery through the discussion of the etymology of signs.

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## APPENDIX A.



QuickTime™



3 Dimensional

The pictures above are examples of the QuickTime™ and 3 Dimensional (rotatable) sign formats.

## APPENDIX B.

### ASSENT FORM TO PARTICIPATE IN A SIGN LANGUAGE STUDY

#### Recall and Comprehension of Signs by High School ASL Students

#### DESCRIPTION

Dear Student

We would like you to participate in a research study of sign language learning using an online lexicon (dictionary). The study is being led by Maria Tedeschi, a graduate student, who has developed this project as part of her Master's degree requirements. Dr. Harry Lang from the National Technical Institute for the Deaf at Rochester Institute of Technology is her advisor.

We are doing this research to identify how technology can help people learn ASL.

- We will show you a series of sign movies. This will take approximately one class period
- This will include measuring your recall of the signs and your comprehension of the signs.
- This will also include videotaping you making several signs for one part of this study. The videotape will be erased after the evaluation is completed.
- When you are done viewing this study, we will ask you to fill out a brief survey and this will be anonymous. We want to learn about what you like about the sign movies and what you think should be further improved.

We do not perceive any risks to you if you take part in this study. One benefit for you may be increased learning of ASL signs. A benefit for the researchers will be improved ASL instruction using technology. **There is no relationship to your grade in your ASL course. This study will help to improve ASL instruction. Your sign language teachers will not see your names and your scores on the recall and comprehension tests. We will use codes (numbers) so that everything will be anonymous. This study is separate from your ASL class and any other school work.**

#### Confidentiality

The information collected from all participants will remain completely confidential. You will not be identified in any publication of research results. The only ASL teacher who will see the individual scores will be Ms. Tedeschi and she will not see the students' names, only the codes. If you choose not to participate in the research study, you will be given another activity to complete during this class time.

Right to Withdraw

You do not have to take part in this study and, should you change your mind, you can withdraw from the study at any time. Refusing to participate or withdrawing will have no penalty.

If you need any additional information, please feel free to contact:

Dr. Harry Lang  
National Technical Institute for the Deaf  
Department of Research  
52 Lomb Memorial Drive  
Rochester, NY 14623-5604  
Phone: (585) 475-6777  
Fax: (585) 475-2525  
Email: Harry.Lang@rit.edu

\_\_\_\_\_  
Signature of investigator

Voluntary Consent:

"I voluntarily consent to participate in this study."

\_\_\_\_\_  
Name of participant (Please print)

\_\_\_\_\_  
Signature of participant

\_\_\_\_\_  
Date

## APPENDIX C.

### CONSENT TO PARTICIPATE IN A SIGN LANGUAGE STUDY

Title: Recall and Comprehension of Signs by High School ASL Students

#### DESCRIPTION

Dear Parent/Guardian:

We would like your permission to involve your child in a short study examining how American Sign Language students remember signs for various animals as they are presented in different movie formats. The study is being led by Maria Tedeschi, a graduate student in the Master of Science in Secondary Education program at the National Technical Institute for the Deaf (NTID) at Rochester Institute of Technology (RIT). Dr. Harry G. Lang from NTID is her advisor.

We are doing this research to identify how technology can help people learn ASL.

- We will show your child a series of sign movies. This will take approximately one class period
- This will include measuring your child's recall of the signs and your child's comprehension of the signs.
- This will also include videotaping your child making several signs for one part of this study. The videotape will be erased after the evaluation is completed.
- When your child is done viewing this study, we will ask him/her to fill out a brief survey and this will be anonymous. We want to learn about what students like about the sign movies and what they think should be further improved.

We do not perceive any risks to your child if he/she takes part in this study. One benefit for you may be increased learning of ASL signs. A benefit for the researchers will be improved ASL instruction using technology. **There is no relationship to your child's grade in the ASL course he or she is taking. The sign language teachers will not see the students' names and their individual scores on the recall and comprehension tests. We will use codes (numbers) so that everything will be anonymous. This study is separate from your child's ASL class and any other school work.**

#### Confidentiality

The information collected from all participants will remain completely confidential. You will not be identified in any publication of research results. The only ASL teacher who will see the individual scores will be Ms. Tedeschi and she will not see the students' names, only the codes. If you choose not to participate in the research study, you will be given another activity to complete during this class time.

Right to Withdraw

Your child does not have to take part in this study. Your child can withdraw from the study at any time. Refusing to participate or withdrawing will have no penalty.

If you have any further questions about this research study, you may contact the investigator, Maria Tedeschi at 424-8095, or her advisor, Dr. Harry G. Lang (see contact information below).

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Signature of investigator

Harry Lang, Ed.D.  
National Technical Institute for the Deaf  
Department of Research  
96 Lomb Memorial Drive, 2433 Carey  
Rochester, NY 14623-5604  
Phone: (585) 475-6777  
Email: Harry.Lang@rit.edu

Voluntary Consent:

All of the above has been explained to me and my child, and all of my current questions have been answered. I understand that I am encouraged to ask questions about any aspect of this research study during the course of this study, and that such future questions will be answered by the researchers listed on the first page of this form.

By signing this form, I agree to have my child participate.

"I voluntarily consent to have my child participate in this study."

---

Student's name

Signature of parent or legal guardian

Date

## APPENDIX D.

Student Code: \_\_\_\_\_

Do you know the signs for any of these animals listed below?  
If so, please circle the animal and let us know.

Alligator  
Bat  
Boar  
Dinosaur  
Dolphin  
Eagle  
Giraffe  
Goat  
Hen  
Hippopotamus  
Jellyfish  
Kangaroo  
Lizard  
Octopus  
Parrot  
Penguin  
Porcupine  
Raccoon  
Rhinoceros  
Rooster  
Scorpion  
Seal  
Sea Lion  
Shark  
Sheep  
Shrimp  
Skunk  
Squid  
Swan  
Wolf  
Zebra

Please raise your hand when you are done with the activity and you will be given the next activity.



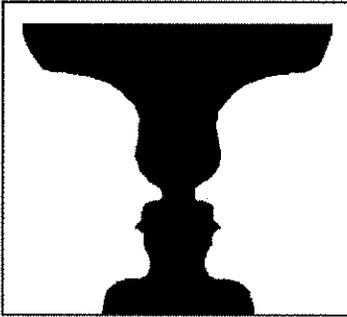
APPENDIX F.

Participant Code No. \_\_\_\_\_

Form B

Please circle one:            I am left handed.            I am right handed.

Write down everything you see in the pictures below in the space provided.

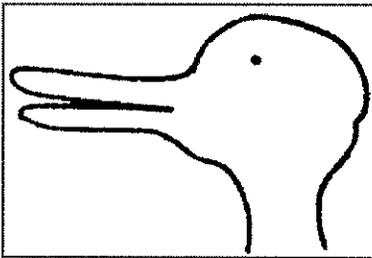


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**APPENDIX G.**

Participant Code No. \_\_\_\_\_

Form C

**Directions:**

Please watch the following videos and write down the animal that you see. Spell it as best you can. If you are not sure, write what animal you think it is. If you don't remember, draw a question mark (?).

Movie	Animal
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Please raise your hand when you are done with the activity and you will be given the next activity.



**APPENDIX I.**

Participant Code No. \_\_\_\_\_

Form E

You will be shown ten signs:

For each animal listed below:

1. While the camera is on please fingerspell the animal and the number
2. Watch the movie and make the sign to the best of your ability
3. Watch the movie a second time and repeat the sign
4. Watch the movie a third time and repeat the sign

Animal

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Please raise your hand when you are done with the activity and you will be given the next activity.

**APPENDIX J.**

Participant Code No. \_\_\_\_\_

Form F

**Questionnaire**

1) When I tried to learn from the Quicktime (human) sign movies, it was:

1	2	3	4
very difficult	a little difficult	fairly easy	very easy

Comments?

2) When I tried to learn from the 3-Dimensional (animation) sign movies, it was:

1	2	3	4
very difficult	a little difficult	fairly easy	very easy

Comments?

3) I enjoyed learning from the Quicktime (human) sign movies:

1	2	3	4
not at all	a little	somewhat	very much

Comments?

4) I enjoyed learning from the 3-Dimensional (animation) sign movies:

1	2	3	4
not at all	a little	somewhat	very much

Comments?

5) Do you have any general comments about the two formats of sign movies used in this research study as they relate to your learning of signs?

6) Do you have any suggestions for improving the quality of the movies for online studying of ASL and individual signs?

## **Acknowledgments**

A very warm and special thanks to Dr. Harry Lang for his endless time, help and support throughout this study. In addition, I would like to thank Scott Whitney for his generosity and skill in developing the animations used in this study and Katie Que for her many hours of rating. Lastly, I would like to thank the High school and students involved in the research, as well as Elizabeth Oberg, Courtney Sanford and Jamal Sarkis for helping with the data collection.