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By
Mackenzie Noelani Barrett
Laura Crosswell, Ph.D., Thesis Advisor

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MACKENZIE NOELANI BARRETT

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ADA Compliancy in Online Television News: Increasing Information Retention for the Hearing Impaired in the Consumption of News

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BACHELOR OF ARTS, JOURNALISM AND INTERNATIONAL AFFAIRS

______________________________________________
Laura Crosswell, Ph.D., Thesis Advisor

Erin Edgington, Ph.D., Assistant Director, Honors Program
May, 2019
Abstract

Using eye-tracking technology on a convenience sample of hearing-impaired individuals, this study asked participants to watch three local television news segments with closed captioning and complete recall and attitudinal questionnaires to test their information retention of the three segments. This study examined where a viewer’s gaze was directed and what information was retained. After analyzing the data, I assessed whether a relationship existed between eye-gaze and information retention. The results of this study support the theories of Information Overload and Limited Capacity Model of Motivated Mediated Message Processing. The numerous sources of information overloaded the participants. Participants did not have high levels of information retained from the news segments as a result of the need to continually divert their attention to different textual and visual information presented in the news segments.

Keywords: eye-tracking, communication, closed captioning, hearing-impaired, news, information overload, information retention
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Introduction

The Americans with Disabilities Act (ADA) became a civil rights law in 1990 (U.S. Department of Labor). This law prohibits discrimination against individuals in all areas of public life. Of particular interest to my project is the law’s inclusion of “communications and access to state and local government programs and services” (U.S. Department of Labor). In 2006, the Federal Communications Commission (FCC) worked with Congress and the National Association of the Deaf to require all new, non-exempt, English-language television programming to include closed captioning (National Association for the Deaf). The FCC has also worked to establish quality standards for closed captioning, creating a foundation for a more uniform presentation of closed captions.

Captions are the television accessibility standard for those who are d/Deaf and hard-of-hearing (DHH). However, it is important to consider whether captions provide all the necessary information in a television (TV) news segment. There are many aspects to a TV news segment, such as the reporter, anchor, images, news crawl (the scrolling ribbon on the bottom of a newscast), graphs and videos. Roland Barthes (1977) argued that text could support image, image could support text, and image and text reinforce each other. Considering this idea through a DHH lens, text is needed in order to understand the message of a visual aspect, regardless of whether the text is

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1 The signifier “d/Deaf” will be used to acknowledge the difference between “deaf” and “Deaf.” According to Neves (2005), “‘deaf’ simply refers to someone who cannot hear well enough to process aural information conveniently [while] ‘Deaf’ means accepting the fact that that person belongs to the Deaf community that, even if a minority, has rules and codes of conduct that differentiate it from others” (p. 84). The main difference between “deaf” and “Deaf” lies in sociology and culture. For purposes of this study, both groups will contribute to evaluating the effectiveness of closed captioning in news segments in my study.
provided through an auditory or textual means. If text is not adequately supplied for the image (photograph or video), how can one be sure that the message is being effectively conveyed, regardless of the audience member?

It is important to deliver the entirety of a message to an audience. When it comes to news production, this responsibility falls upon journalists. Journalists are the fourth estate, providing information to the public from all sectors of life. News educates citizens about current events in their local community, and around the world. This allows citizens to actively participate in their local community, contributing to and taking part in the conversation (Mindich, 2005). However, journalists face the issue of deciding how to best reach their audience, continually finding new ways to communicate the news. A particular problem arises when a part of the population is not reached, which leaves them uninformed about important topics and problems to the extent that they cannot take part in the conversation in order to contribute to their community. Woodstock (2013) advances the idea of a news democracy narrative, where the more educated or informed a person is, the more likely they will contribute or act in a democracy. Therefore, we need to make sure that everyone, including the DHH audience, is involved in Woodstock’s (2013) idea of the news democracy narrative.

This study analyzed the information retention of a DHH participant when closed captions were provided for local television news. Using eye-tracking technology, this study investigated where a viewer’s gaze was directed while they received verbal,

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2 The “fourth estate” refers to journalists, or those who report the news. Using the phrase “the fourth estate” acknowledges the role that journalists have in observing the political process by the three branches of government and providing information on their actions to the public in a clear and concise manner.
textual and visual information. I analyzed eye-tracking data, recall and attitudinal questionnaires to further examine information processing and retention. Lang’s Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) guided the following analysis.

Lang’s model makes the assumption that news consumers process information with limited cognitive capacities. LC4MP assumes that, when there are multiple forms of information delivered in a news segment, the consumer will not be able to process and store all the information from the segment. This leads the consumer to overlook information delivered in the segment and results in a declined level of information retained.

The data was compiled and analyzed using arithmetic means and Pearson’s correlation coefficient to determine whether a relationship exists between eye gaze and information retention. This study aimed to increase the understanding of DHH information retention within the realm of television news. I concluded this study by determining if the closed captioning provided by local television news broadcasts is sufficient for effective communication and full information retention for their DHH viewers.
Literature Review

In a democracy, community is necessary (Friedland, 2001). A community is created through communication, specifically with the exchange of information and the news reporting (Robinson, 2007). Today, most literature would characterize “news” as uniting, informing and entertaining its viewers (Pavolik, 2015). Moreover, news offers a community for its viewers. In 2013, Woodstock called for the news democracy narrative, arguing that there is a “sequential relationship in which news consumption is said to increase political knowledge that in turn increases political engagement” (p. 835). Ellcessor (2012) believes that giving people the ability to participate culturally and civically is tied to the ability to use a media environment, whether that is consuming, watching or making sense of it. According to Dahlgren (2005), the media has an important role in creating civic cultures. Civic cultures are those in which individuals can understand themselves as members of a group, even a nation, and take political action. Given the role that media plays in civic engagement, there is a need to look a communities where it is possible that the information is not being delivered in a manner that is fully accessible.

In 1990, the Americans with Disabilities Act (ADA) became a civil rights law prohibiting discrimination against people with disabilities (U.S. Department of Labor; U.S. Department of Justice Civil Rights Division, 2009). In 1990, Congress approved the Television Decoder Circuitry Act (Gregg, 2006). The act required that all television sets 13 inches or larger sold in the United States must be manufactured to include caption-decoding microchips. Consequently, the DHH population in the US had increased accessibility to captions on commercials and programs because of the
act (Gregg, 2006). The Federal Communications Commission (FCC) became responsible for regulating Title IV of the Telecommunications Act of 1996, a provision requiring closed captioning of public service announcements that were federally funded (Federal Communications Commission, 2018; Gregg, 2006).

Through the FCC, Congress required all video programming distributors, including cable, broadcasters, satellite and other multi-channel video programming, to provide closed captioning for their TV programs (Federal Communications Commission, 2018). Today, literature defines “captions” as subtitles in normal television broadcasts and videos, including videos on the Internet, that enable DHH individuals to see what they cannot hear (Gregg, 2006; Jensema et al., 2000). The FCC defines “closed captioning” as the display of “the audio portion of a television program as text on the TV screen, providing a critical link to news, entertainment and information for individuals who are [d/Deaf] or hard-of-hearing” (Federal Communications Commission, 2018, par. 1). Moreover, closed captions need to be “decoded using a television decoder or built-in decoder chip to be seen” (Gregg, 2006, p. 539). In contrast, open captions are always displayed on the television screen and cannot be turned off by the viewer. In other words, open captions do not offer viewers the choice to decide if they will appear, while closed captions do give viewers the choice. The ability to decide whether captions are shown or not is important, as not everyone needs or desires to use captions while they watch a video program. However, for many DHH individuals, captions are a necessity when watching any type of video.
The FCC put in place rules for closed captioning, in order to ensure that DHH viewers could have full access to the programming. The FCC (2018) requires captions to be:

- “Accurate: Captions must match the spoken words in the dialogue and convey background noises and other sounds to the fullest extent possible.
- Synchronous: Captions must coincide with their corresponding spoken words and sounds to the greatest extent possible and must be displayed on the screen at a speed that can be read by viewers.
- Complete: Captions must run from the beginning to the end of the program to the fullest extent possible.
- Properly placed: Captions should not block other important visual content on the screen, overlap or run off the edge of the video screen” (par. 3).

Standards for captioning in the rules change based on the type of programming, whether it is pre-recorded, live or near-live. Pre-recorded programming refers to programs that were recorded before the time that they aired. Live programming refers to programs airing at the same time that they are being recorded and near-live programs have a delay in recording to the time they air. However, with near-live programs, the delay is short, for example a 30-second or one-minute delay. While the above rules apply to all TV programming with captioning, there are two categories of exemptions: (1) public service announcements that are shorter than 10 minutes, not federally paid for, shown between 2 AM and 6 AM, and text-based; and (2) locally
produced non-news programming that has no repeat value (Federal Communications Commission, 2018). Regardless of the different captioning standards for different programs, they must all adhere to the four regulations. The regulations ensure that the closed captions are fully accessible to all viewers, including the DHH population.

With the news more accessible in new ways, it is important to consider whether segments of the population have access. Moreover, it is important to consider whether the DHH population can access all the information in the same ways that a non-hearing impaired individual can. Specifically, are the measures for closed captions in place today effectively communicating information from news segments to DHH individuals? In 2010, President Barack Obama signed the Twenty-First Century Communications and Video Accessibility Act (CVAA) into law (Federal Communications Commission, 2017). The CVAA was meant to bring the federal communications law up to date with newer technologies to increase the access to modern communications for peoples with disabilities. Specifically, Title II of the CVAA includes a provision to require “video programming that is closed captioned on TV to be closed captioned when distributed to the Internet” (Federal Communications Commission, 2017). However, as of February 2019, not all video programming on the Internet has closed captions. In 2015, Youngblood and Lysaght took a one fifth sample of the U.S. Designated Market Area (a market area is a region where the population can receive the same radio and television station offerings) to analyze how prepared local TV news sites were for the new 2016 FCC guidelines for captioning online videos. The new 2016 FCC guidelines created additional requirements to the CVAA, calling for “broadcasters to caption online clips from
shows originally aired with captions” (Youngblood & Lysaght, 2015, p. 243).
Youngblood and Lysaght (2015) found that only 60% of local TV news sites had captioned any of their sampled video clips and that nearly every sampled site had accessibility issues, such as not having alt attributes³ for their images or relying on font size and color to indicate the meaning of text, rather than semantic coding; Youngblood and Lysaght (2015) argue there is an issue of inclusivity within accessibility (p. 244). Ellcessor (2012) adds that “the literal inability of some audiences to access media excludes them from notions of citizenship within a mediated public sphere in which political knowledge and participation increasingly occur” (p. 331). This research supports an earlier argument made by Fiske in 1987, who claimed that if those with disabilities are not given the tools or accommodations to use media, they are only partially able to participate in a democracy (Ellcessor, 2012).

Ellcessor (2012) argues that business in the media industry largely decides how online captions should appear. In other words, it “offers to greatly expand the possibilities of participation for [d/Deaf] and hard-of-hearing Americans,” it “threatens to occur in their name while ignoring their specific needs […] potentially damaging the coalitional politics that gave rise to the civil rights of people with disabilities” (p. 331). While captioning for videos is increasingly provided online, the standards may not fit the needs of the DHH population. For example, Franco and Santiago Araújo (2014) conducted a pilot study analyzing the closed subtitling model in Brazilian television networks. Using a population of both non-d/Deaf and d/Deaf

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³ Alt attributes refers to the descriptive text describing what an image portrays, in the event if a screen does not render or if an individual is using a screen reader or is visually impaired.
viewers, the researchers considered whether the subtitling model provided effective in its communication of messages. Franco and Santiago Araújo (2014) found that the closed subtitling models used could be designed with the DHH community in mind. Baker and Kaufman-Scarborough (2001), as cited in Gregg (2006), state “it is not the impairment that is disabling, but the surroundings that limit the person’s abilities” (p. 538).

In a different study, Jensema (1998) investigated viewer reactions to different television captioning speeds, using a population of both DHH and hearing. The research design included eight 30-second video segments, where the captioning speed, based on words per minute (WPM), was increased from 96 WPM up to 200 WPM. Jensema (1998) expected that hearing people would not depend on captions and therefore would have less practice than the DHH at reading captions, as the DHH population tended to watch captioned television every day (p. 284). Indeed, findings illustrated that hearing people preferred slower captions compared to the DHH. It is evident that the DHH population do have preferences in regards to how their captions appear while they watch a video program. Today, as of April 2019, consumers of video programs are able to choose the style that their captions appear on screen in terms of their visual appearance; they are able to choose what the color of the text and text box will be. However, not all video programmers offer this choice; nor do consumers have the choice to choose the speed that the text appears on screen. This can become an issue, especially if, as seen in Jensema’s (1998) study, consumers have captioning preferences that cannot be accommodated to.
In the media climate today, there are a number of sources consumers can turn to for information, whether that be the Internet, social media, television, or print newspapers. Accordingly, there are many different news stations and outlets, with the number continuing to rise every day. Due to the increasing number of ways in which information can be delivered, individuals must utilize information-processing strategies to find ways to understand the information. Kosicki & McLeod (1990) define “information-processing strategies” as “tactics that individuals use to try to cope with the amount and kind of mass media information that they encounter in their everyday lives” (p. 73). These strategies involve a cognitive aspect to processing information based on how a person focuses attention on, and interprets, a media message. Absorbing and storing information reflects a three-dimensional process (Lindsay & Norman, 1977). A person is first exposed to a piece of information and then decides whether to ignore or absorb the information. If the person decides to absorb the information, it is processed to working memory then to long-term memory, where stored knowledge is held. Whenever necessary, stored information can be recalled from long-term memory. In other words, the information is received, processed, stored, and then finally recalled. Sometimes, the information is not correctly stored which can create a problem when the information needs to be recalled. Consider a filing cabinet. If a file is not placed correctly into the right folder, it might be difficult to find the file again when it is needed. The same metaphor works for information storage and recall.

Paivio (1990) argued that, in dual coding theory, there are two independent and interconnected memory systems that encode information, one being verbal and
the other visual. These systems can be activated independently, but they can also be activated together to dual-code information. However, it is possible that learning can decline when there is an overload of information. Dual-coding is specifically related to the research I conducted.

Information Overload Theory was first developed by Alvin Toffler in 1970 (Pavolik, 2015). When there is an excessive amount of information presented, cognitive and sensory processing can be overloaded. There are four structural conditions of information overload:

1. Time Sensitivity: limits to the time allowed to review the available information;
2. Decision requirement: time constraints for making a decision;
3. Structure of information: when the amount of information is less important than how it is structured, allowing the consumer to judge what is relevant
4. Quality of information: relating to what type of information is presented and whether it is straightforward or other, such as comedy or drama. (Hargittai et al, 2012)

Ellison (2006) has argued that media such as the television and the Internet give news consumers too much information, creating an information overload. Sweller (1988) argues in cognitive load theory that working memory has the capacity to process only seven pieces of information at a time.

In 2000 and 2006, Lang conducted a series of studies dealing with a theoretical framework built on cognitive and information-processing (Opgenhaffen &
d’Haenens, 2011). Lang’s Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) made the assumption that consumers of news process information with limited cognitive capacities. There are three sub-processes to the processing of news, which begins immediately upon the exposure to news: encoding, storage, and retrieval. Encoding is the first stage, where sensory receptors store both verbal and visual information based on selection that is controlled and automatic (Lang, 2000; Lang, 2006; Opgenhaffen & d’Haenens, 2011). Encoding transfers only some of the information into working memory. The second stage is storage, which is the process where new information is linked to existing information that was stored earlier in human memory. The last stage is retrieval, which entails of reactivating stored information to both understand and store the new pieces of information. However, the level of how the information is processed depends on the cognitive efforts that are required for the sub-processes, which is up to the consumers of news. Opgenhaffen and d’Haenens (2011) state that “the better these sub-processes are implemented, the more they will result in acquisition of knowledge” (p. 9). If there is not an adequate level of cognitive resources utilized within the sub-processes, then they will not be fully implemented and knowledge acquisition will decline. However, the consumers have a limited amount of cognitive resources, therefore any tasks that are complex can cause cognitive overload. A news segment provides information through visuals (such as photographs, video and graphs) and text (including titles of the anchor or reporter, bulleted descriptions, quotes, and news crawls). Television and Internet news can be seen as possible sources for information overload for the DHH population because they may need to incorporate captions in order to fully access the
information. Captions add another source of information that needs to be processed in order for the content to be understood clearly, in addition to the visuals and other text provided. The added source may make it difficult to correctly process the information, given Lang’s LC4MP.

Eye-tracking research can provide insight by allowing researchers to clearly see where a viewer’s gaze is directed while they watch a news segment. Jensema et al. (2000) conducted a study investigating the eye movement patterns of captioned television programs. Eye-tracking technology was implemented to investigate what the viewing process became when captions were provided for six subjects. Jensema et al. (2000) found that the addition of captions on a television program became a reading process; reading the captions dominated the viewer’s eye movement, while viewing the screen action became secondary. Jelinek & Jackson (2001) argued that a reciprocal relationship existed between the comprehension of a television program and reading ability, specifically involving language skills. Their study was designed to include both d/Deaf and hearing students, who were tested on their comprehension of captioned videos. The researchers argued that even though d/Deaf individuals may enjoy watching television, “they may not fully comprehend the content of the programs” (p. 45); they may understand and observe the visual activity on the screen, but they may interpret the intention or meaning of action when the conversation or narrative in the program is not evident or fully comprehended. Jelinek and Jackson (2001) found that even with equivalent levels of reading, the d/Deaf students were behind the hearing students in their ability to answer the comprehension questions correctly using generalized or prior knowledge.
While Franco & Araújo (2003) did not use eye-tracking technology in their research, they conducted a pilot study focused on Brazilian TV and the closed subtitling model. The pilot found that if the DHH population was not taken into consideration when designing captioning models, then those models would not succeed (Franco & Araújo, 2003). However, there is limited research existing in TV news information retention in the United States regarding the DHH community. Pavolik (2015) submitted a dissertation testing information overload in TV news programming focusing on news crawls and audience retention but did not focus on the DHH community. Pavolik found that news crawls impacted immediate recall, but that there was no significant impact on long-term retention of the information.

For my project, I utilized eye-tracking technology, but my focus investigated information retention within the DHH population. As seen on many media channels, there are various locations on a television screen where text will appear, whether it is captions for a graph or photo or the news crawls at the bottom of the screen. In addition to the textual information, there is auditory information from the reporters. If the viewer has a hearing impairment, they may lose the auditory information provided if they do not utilize closed captions. However, even if they utilize closed captions, they may lose a portion of the textual and even the visual information, since the screen is overcrowded with varying types of information.

As such, the following research questions were proposed:

**RQ1:** Does the closed captioning provided follow the regulations as defined by the FCC?

**RQ2:** How does viewer fixation relate to information retention?
**RQ3:** To what degree are participants able to recall specific visual information delivered in the news segments?

**RQ4:** To what degree are participants able to recall specific textual information delivered in the news segments?

**RQ5:** Does the placement of closed captions influence viewer fixation or information retention for each of the news segments?
Methodology

Research Approach

I used eye-tracking technology to determine whether a correlation existed between viewer gaze and information retention among the DHH population. My research design asked participants to come into a lab to view news segments and answer a recall and attitudinal questionnaire. During their viewing, Tobii X2-60 tracked the participant’s gaze during the segment using areas of interest. Tobii X2-60 is an eye-tracking device that resembles a regular computer monitor. The equipment was provided by the Center for Advanced Media Studies (CAMS) lab in the Reynolds School of Journalism at the University of Nevada, Reno.

Procedure

Participants were asked to come to the CAMS lab in the Reynolds School of Journalism to watch three different news segments in the following order: “New airline to service Reno-Tahoe International Airport” (KTVN Channel 2), “Haunted house raises money for Boys and Girls Club” (KOLO 8), and “Special Olympics bowling” (News 4 and FOX 11). In between each news segment, participants answered recall questions pertaining to the content of the news segment. A total of 41 recall questions were asked to test the information retained from the viewing of the news segments. I used a 22-item attitudinal questionnaire to measure participant attitudes towards the closed captions provided in the news segments. The recall questionnaire included unaided and aided survey questions to measure recall and recognition, as well as open-ended questions. Aided questions provided some guidance to the participant for specific information to recall, while unaided questions did not. To analyze attention to visual detail, the participants were asked specific
questions geared towards visual aspects of the news segment, for example, the color of the shirts of the children playing at the airport or the costume worn by a person interviewed. Each of the quiz questions asked after each news segment are included in Appendix C. After the three news segments and quizzes were completed, participants completed a post-test questionnaire. The questionnaire surveyed the demographics of the participants and their attitudes toward the closed captioning for each news segment. A copy of the post-test questionnaire is included in Appendix D.

Participants

Prior to collecting data, I recruited eight individuals to pilot the study. Both men and women were observed in the pilot study, ranging from the ages of 18 to 64. Six of the piloted individuals did not identify with any hearing loss or impairment. Two of the eight piloted individuals identified as d/Deaf. Pilot participants were not required to identify as DHH, as their purpose was to test the study before bringing participants into the lab. The pilots helped me assess whether changes or adjustments needed to be made to the procedure of this study.

I recruited 12 participants from the University of Nevada, Reno and from the local community in Reno, Nevada throughout 2019. I recruited from both the University of Nevada, Reno and the community to find DHH participants for the study. In total, 12 different participants, with different levels of hearing loss were included in the study. All participants were volunteers, however their participation was incentivized by offering each of them a $15 Amazon gift card. At the end of the study, every participant was entered into a raffle to win the grand prize of a $50 Amazon gift card. Of the 11 participants, a majority of the participants were male
A majority of the participants identified in the 18-24 years old age range (0.58). Only two participants identified as d/Deaf (0.17), while the other 11 participants identified as hard-of-hearing, depending on their level of hearing loss, which in some cases did include being unilaterally deaf.4

**Communication with Participants**

To communicate with the participants who preferred a transcription service, I used the program TypeWell (see Figure 1). I am a Qualified TypeWell transcriber and work for Intellitext, LLC. A transcriber is someone who attends class with a d/Deaf or hard-of-hearing student and transcribes the lecture and conversation that takes place during the class. We provided this access real-time for the student. Therefore, as I transcribe, my text is streamed wirelessly to a PC, Mac, tablet, or smartphone (see Figure 2). We utilize a meaning-for-meaning style of transcription, rather than verbatim. Meaning-for-meaning preserves the speaker’s intended message in fewer words, making for a clean and easy-to-read transcript that eliminate false starts, repetition and filler words. Meaning-for-meaning also reflects emphasis, meaningful pauses and cues such as [sarcasm] and [joke], and body language – these are all key to optimal reader comprehension and are not found in a verbatim transcript. Additionally, all of the real-time transcribers working for Intellitext, including myself, are qualified TypeWell transcribers and educated on Deaf culture.

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4 Unilaterally d/Deaf refers to an individual being d/Deaf in one ear, as opposed to both ears.
Figure 1. A screenshot of the TypeWell software that I used to communicate with the participants. The blue window at the top indicates that the participant sent a message to me.
Hello! My name is Mackenzie and I am the researcher who will be conducting the study today. Please show me a form of identification so that I may confirm your appointment. A government-issued ID or student ID will work.

Great! This is the participation consent form. Please read through it before you sign. Once you sign the consent form, we can get you started.

We'll be conducting a two-part study today consisting of videos and surveys. This should take roughly 15-20 minutes, but it does vary.

First, you will watch three news segments. Then, you will complete three quizzes about each of the segments. Afterwards, you will complete the post-test survey.

I'm going to use a random number generator to give you a number. Here is your number. I'll write it down on a post-it note. Please keep this ready for the surveys.

Do you have any questions so far?

Please sit in front of this computer. I'd like to have your body facing this screen. I'm doing a few configurations here, just to make sure you are close enough to the screen.

A red dot will show up on the screen. Follow that with your eyes.

Now you are all configured. There are headphones for the audio for the videos. The audio can be adjusted by pressing Fn and F8 (to decrease) or F9 (to increase).

TypeWell was a suitable program to utilize to communicate with DHH individuals, as this service is complaint with ADA (Intellitext). Additionally, in the Individuals with Disabilities Education Act, Congress specified that TypeWell is “a transcription service that meets the definition of interpreting services, and should be considered as an effective tool to meet the communication access needs of students with disabilities” (par. 10).
Selection of Media

I selected three news segments from major local television news networks: ABC (KOLO 8), NBC/FOX\(^5\) (Fox 11 and KRNV News 4), and CBS (KTVN 2 News). The clips segments selected are as follows: “Haunted house raises money for Boys and Girls Club” from Fox 11 and KRNV News 4, featuring a local family that designed a haunted house with elaborate rooms to raise money; “New airline to service Reno-Tahoe International Airport” from KTVN 2 News, announcing the launch of a new airline at the local airport with visuals on children participating in activities at the airport to celebrate the launch; and “Special Olympics bowling” from KOLO 8, featuring a bowling alley that hosted the local Special Olympics group for their event. These news segments were chosen specifically because they do not include a political message in their information. Additionally, these segments include varying sources of delivered information (reporter, anchor, and visuals). Closed captions were provided for each of the segments and participants were asked to watch each segment (see Figure 3). Both the commercial and verbatim transcripts of the three news segments have been included in Appendix A and B, respectively. Commercial transcript refers to the transcript provided by the news station, while verbatim transcript refers to the transcript I transcribed of the spoken word from the news segment.

\(^5\) In Reno, the NBC affiliate channel, KRNV News 4, and the FOX affiliate, FOX 11, work in conjunction together. Essentially, the two stations work together to deliver the same news content.
Areas of Interest

As a secondary measure of the information retention in a participant, areas of interest (AOI) were utilized in this study to confirm that a participant did see a visual aid or tracked the captions while watching the news segments (see Figures 4 and 5). AOIs are boxes drawn around the news segment using the Tobii eye-tracking technology to draw metrics regarding viewer gaze. An AOI is able to track the amount of time a participant fixates on a certain region and how many times they fixate on the region. These measurements are respectively known as fixation count and fixation duration. In this study, a fixation is defined as a directed gaze within 35 pixels that lasts for a minimum of 250 milliseconds. The areas of interest focused on the closed captions as well as any other visual elements in the segment, such as photographs, videos within the segment or the anchor or reporter.
Figure 4. A screenshot of the AOIs (Anchors, Cal Pacific Graphic, Runner, Captions, Tie) from the KTVN News 12 segment “Reno-Tahoe International Airport Announces New Airline.”

Figure 5. A screenshot of an AOI (Witch) from the News 4 and Fox 11 news segment, “Haunted House Raises Money for Boys and Girls Club.”
Analysis of Data

The study analyzed the information retention of a DHH participant when closed captions are provided for local television news. Using eye-tracking technology, the study was able to see where a viewer’s gaze was directed as verbal, textual and visual information was received. The viewer’s gaze was analyzed along with a post-test survey to understand how information was retained after the viewing utilizing Lang’s LC4MP. The data was compiled and analyzed, to determine the level of information retention. This study aimed to increase the understanding of DHH information retention within the realm of television news. The data were used to determine whether a
relationship exists between viewer gaze and information retention in DHH individuals consuming television news uploaded to the Internet.

Confidentiality and Treatment of Subjects and Data

Upon visiting the CAMS lab to participate in the study, each participant was assigned a unique five-digit number. The responses to the quizzes and survey were downloaded from Qualtrics into an Excel spreadsheet. The survey collected demographic data from each participant, including their sex, age range, and their identification as either d/Deaf or hard-of-hearing. The assigned unique number for each participant was used to align the data from the surveys and the eye tracker. The collected data was entered into an Excel spreadsheet to be combined and analyzed using SPSS. The collected data that was analyzed did not contain any personal identifying information from the participants. All data was collected and stored according to the Institutional Review Board’s subject and data protection policies (see Appendix E for the approval forms from the Research Integrity Office at the University of Nevada, Reno for this study).
Results

**RQ1:** Does the closed captioning provided follow the regulations as defined by the FCC?

The FCC defines four regulations for closed captions, which include accuracy, synchrony, completion, and proper placement (FCC, 2018). In order to be accurate, the closed captions need to match both what is spoken and the background noise that is present. To find the accuracy of the closed captions provided by the news station and the spoken dialogue, I transcribed the news segments verbatim and compared the closed captions and the verbatim transcript in Microsoft Word documents. I found the total number of spoken words and the total number of words omitted from the closed captions. After dividing the total number of correct words in the closed captions, for example, 80, into the total number of spoken words, say, 100, I could find the average of accuracy, which in this case would be 80%. The closed captions in the news segments included as stimuli had an average of 81% accuracy. The segment “Reno-Tahoe International Airport Announces New Airline” from KTVN Channel 2 had a total of 133 spoken words. From the 133 spoken words, only 123 of the words appeared accurately in the closed captions (0.92). 11 words were not included in the closed captions and the closed captions added one word to the transcript that was not spoken.

“Haunted House” from News 4 and FOX 11 had a total of 178 spoken words during the segment. Out of the 178 spoken words, only 116 of the words appeared accurately in the closed captions (0.65). 38 words were not included the closed captions. The closed captions had 11 incorrect words.
With a total of 129 spoken words in the news segment “Special Olympics” from KOLO 8, only 112 words in the commercial closed captions were accurate (0.86). 22 spoken words by either the reporter or the interviewees were not included in the closed captions.

Synchrony requires the closed captions to be displayed at the same time as the spoken words and sounds occur during a segment (FCC, 2018). The captions must also be displayed on screen in a way that can easily be followed and read by the viewers. To find the delay in the time that a line was spoken and the time that the line appeared in the closed captions, I counted the seconds that passed as soon as the line was spoken to when it appeared in the closed captions. The captions in the KTVN Channel 2 segment have a several second delay from when the line is spoken to when the captions appears on screen. For example, there is a three-second delay from when the line “California Pacific Airline offers four non-stop flights a week…” is spoken to when it appears on the screen. The delay between the spoken dialogue and closed captions fluctuate between one second and four seconds throughout the segment.

There is a six-second delay before closed captions appear in the News 4 and FOX 11 news segment. The first captions to appear are “FULL FORECAST. >>>,” which is not in the spoken dialogue of the segment. The captions do not change for nine seconds, when it is 14 seconds into the segment. The captions maintain at least a four-second delay, with a maximum of a seven-second delay. The delay in this segment is the highest among the three different segments.

The KOLO 8 news segment has a three-second delay between the first spoken word and appearance of closed captions. The first caption to appear is “NIGHT AT
THE NATIONAL” four seconds into the segment. The delay between the spoken word and the closed captions varies between a one and a two-second delay, which is the smallest amount of delay among the three different segments.

Complete captions mean that the closed captions run from the start to the end of the segment (FCC, 2018). To determine how complete the closed captions were in the news segments, I counted the number of seconds that passed before the closed captions appeared at the start and the end of the news segment. By doing so, I was able to find the delay in the closed captions and to keep track of when the closed captions began or ended in relation to the spoken dialogue. The KTVN Channel 2 segment has a seven-second delay from the start of the segment to the first appearance of closed captions. Captions run from that delay to the end of the segment, however the captions do not stop on what is spoken. The captions end abruptly on the line “THEY’LL BE STARTING FLIGHTS FROM CARLSBAD TO LAS VEGAS ON—,” instead of the last spoken line, which is “They'll start flights from Carlsbad to Las Vegas on November 15th.” See Appendices A and B for the accurate and commercial transcripts of this news segment.

The closed captions in the News 4 and FOX 11 news segment do not run for the entirety of the segment. As mentioned above, the accurate captions do not appear in the segment until it is 14 seconds in; the captions “FULL FORECAST. >>> appear on screen five seconds into the segment and do not change to the accurate closed captions until nine seconds passes. The captions end two seconds before the end of the segment on the line “GOOD FOR.” The last line of captions does not match the last spoken line, which is “Alright, good for him. The haunted house will be open
again tomorrow and then on Wednesday and again all the money raised will go the Boys and Girls—” (see Appendices A and B for the accurate and commercial transcript of this segment).

In the KOLO 8 news segment, the closed captions begin four seconds into the segment and run to the end of the segment. The first line of captions is “NIGHT AT THE NATIONAL,” which does not correspond with the first spoken line, “New tonight at 11 o'clock, it's a spook-tacular night at the National Bowling Stadium benefitting Special Olympics Nevada” (see Appendices A and B for the accurate and commercial transcripts for this segment). The last line of the segment is accurate in the closed captions, however a line is added to the closed captions that is not spoken in the segment, “LET’S PRAY FOR FOX AFFILIATES AROUND THE.”

Properly placed closed captions mean that the captions should be placed where they are in full and where they do not overlap other visual or textual content in the segment (FCC, 2018). The captions in the KTVN Channel 2 segment are placed in the lower center of the screen (see Figure 7).
The captions run stacked with one to four lines present, varying throughout the segment. The captions overlap with textual information during the segment in two instances. The first instance is when the reporter’s name and title is shown. The second instance is when the interviewee’s name and title is shown (see Figure 7). On a different, but related note, the closed captions display the name of the interviewee incorrectly as “Marily More,” when the interviewee’s name is actually Marily Mora.

The closed captions in the News 4 and FOX 11 segment are placed on the lower left corner of the screen (see Figure 8). The captions do not overlap greatly with the textual information in the segment. The only textual information blocked by the captions is “Halloween,” shown in the red portion of the headline. The captions run in two lines during the segment, with a bit of space in-between the lines.
Figure 8. A screenshot of the placement of the closed captions during the News 4 and FOX 11 segment. The closed captions do not heavily overlap with the headline of the segment, only overlapping with the text “HALLOWEEN” in the red portion of the headline.

In the KOLO 8 news segment, the closed captions are placed in the lower center of the screen (see Figure 9). The captions overlap with the headline “BOWLING FOR THE SPECIAL OLYMPICS” and “RENO NATIONAL BOWLING STADIUM,” as well as the names of the two interviewees and their titles.

The captions are stacked in three rows with space in between each line.
Figure 9. A screenshot of the placement of the closed captions during the KOLO 8 segment. The closed captions overlap with the headline of the segment in this screenshot, blocking the words “BOWLING FOR THE SPECIAL OLYMPICS” and “RENO NATIONAL BOWLING STADIUM.”

**RQ2**: How does viewer fixation relate to information retention?

There were a total of 35 recall questions considered for data analysis to measure the level of information retained by the participants. To find the level of information retained by the participants, I found the number of correctly answered questions from a participant and divided it by the number of recall questions. For example, if a participant answered 20 questions correctly, I would divide that into 35 and get 0.5714, which would equal 57% of correctly answered recall questions.

Across all news segments, the average score of correct answers was 40%. The highest score, reflecting the highest level of information retained, was a 58% total correct answers, while the lowest score was a 29% total correct answers.

Breaking averages down by news segment, the segment from News 4 and FOX 11 had the highest average score of correct answers, with 61% (see Table 1). The KTVN Channel 2 news segment had the lowest average score of correct answers,
with 22%. The recall question with the most correct answers recorded was “Is the haunted house kid-friendly?” from the News 4 and FOX 11 segment, with all participants answering the question correctly. Two questions tied for having the least correct answers recorded, both of which were from the KTVN Channel 2 segment: “What day does the jet start offering flights?” and “What was the name of the woman interviewed?” (see Appendix C for a list of all recall and attitudinal questions asked).

Table 1

Levels of Information Retention Measured by Average Number of Correct Answers to Recall Questionnaire

<table>
<thead>
<tr>
<th>News Segment</th>
<th>Correct Answers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTVN Channel 2, “Reno-Tahoe International…”</td>
<td>3.08</td>
<td>22.04</td>
</tr>
<tr>
<td>News 4 and FOX 11, “Haunted House”</td>
<td>6.41</td>
<td>60.99</td>
</tr>
<tr>
<td>KOLO 8, “Special Olympics”</td>
<td>4.17</td>
<td>37.88</td>
</tr>
<tr>
<td>Totals (N = 12)</td>
<td>4.55</td>
<td>40.30</td>
</tr>
</tbody>
</table>

The KTVN Channel 2 news segment had a total of 13 recall questions. The News 4 and FOX 11 news segment had a total of 11 recall questions. The KOLO 8 news segment had a total of 11 recall questions.

On average across all three segments, the participants fixated on the closed captions AOIs for a total of 16 seconds during one segment (see Table 2). The segment with the level of highest viewer fixation was KOLO 8’s “Special Olympics” with an average of fixation duration of 18.88 seconds.
Table 2

*Total Fixation Duration on Closed Captions AOIs Average Across the News Segment in Seconds*

<table>
<thead>
<tr>
<th>News Segment</th>
<th>Fixation Duration</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTVN Channel 2, “Reno-Tahoe International…”</td>
<td>15.28</td>
<td>30.56</td>
</tr>
<tr>
<td>News 4 and FOX 11, “Haunted House”</td>
<td>13.92</td>
<td>22.82</td>
</tr>
<tr>
<td>KOLO 8, “Special Olympics”</td>
<td>18.88</td>
<td>40.17</td>
</tr>
<tr>
<td>Totals (N = 12)</td>
<td>16.03</td>
<td>31.18</td>
</tr>
</tbody>
</table>

The KTVN Channel 2 news segment ran for a total of 50 seconds. The News 4 and FOX 11 news segment ran for a total of 61 seconds. The KOLO 8 news segment ran for a total of 47 seconds.

**RQ3:** To what degree are participants able to recall specific visual information delivered in the news segments?

There were six visual-recall questions considered to analyze the level of information retention for the participants. Visual information included information such as logos, colors and decorative items featured in the news segments. To find the level of visual information retained by the participants, I found the number of correctly answered questions from a participant and divided it by the number of recall questions. For example, if a participant answered 3 questions correctly, I would divide that into 6 and get 0.50, which would equal 50% of correctly answered recall questions. Out of the six visual recall questions, the average score of correct answers was 47% (N=12). The lowest score from a participant was 0%, while the highest
score, reflecting the highest level of information retained, was 83% total correct answers for all segments.

**RQ4:** To what degree are participants able to recall specific textual information delivered in the news segments?

With a total of 29 textual-recall questions considered for information recall, the average score for correct answers from the participants was 26% (N=12). Textual information was limited to information in the closed captions or the headline, which included the title of the segment or names of those interviewed or reporting. To find the level of textual information retained by the participants, I found the number of correctly answered questions from a participant and divided it by the number of recall questions. For example, if a participant answered 20 questions correctly, I would divide that into 29 and get 0.6896, which would equal 69% of correctly answered recall questions. The highest score from a participant was a 62%, reflecting the highest level of information retention. The lowest score was 27% and was duplicated by three different participants.

**RQ5:** Does the placement of closed captions influence viewer fixation or information retention?

Referring to Table 2, it appears that participants fixated on closed captions for a longer duration of time on the KOLO 8 news segment, as they fixated on closed captions for 40% of the segment. Participants fixated on the closed captions in the KTVN Channel 2 news segment for 30% of the segment and on the closed captions in the News 4 and FOX 11 news segment for only 23% of the segment. In terms of information retention, participants had the highest level of information retention for
the News 4 and FOX 11 news segment, with an average of 61% correctly answered questions (see Table 1). The KOLO 8 news segment had an average of 38% correctly answered questions, with KTVN Channel 2 following with an average of 22% correctly answered questions. In the KTVN Channel 2 and KOLO 8 news segments, the closed captions are placed in the lower center of the screen (see Figures 7 and 9). The closed captions are placed in the lower left corner of the screen in the News 4 and KOLO 8 news segment (see Figure 8). There does not appear to be a clear relationship between viewer fixation and information retention based on the placement of captions, as the patterns for total fixation duration and correctly answered questions do not match up. Independent sample t-tests were used to analyze the data using SPSS and no significance or relationship between the two variables was found.
Discussion and Recommendations

Closed captions are supposed to represent the full meaning and message of news segments in order to allow DHH individuals to see what they cannot hear. If the closed captions are unable to communicate the full message to a DHH individual, how can we be sure that they are receiving the message at all? The results of this study demonstrate the inability of closed captions to promote high levels of information retention from news segments for DHH consumers of news. The participants in this study fixated on the closed captions in the news segment for an average of 31% of the total duration of the news segments. In addition to fixating on the closed captions, participants fixated on other sources of information, such as the names and titles of those interviewed as well as visuals such as logos or activities individuals in the segments. The participants scored an average of 40% correctly answered questions on the recall questionnaire. The recall questionnaire included questions pertaining to the visual and textual content of the news segment. Furthermore, the results indicate low levels of information retained in relation to relatively higher levels of fixation on the closed captions in the news segments. While various factors come into play, such as the inaccuracy of closed captions provided by the news stations and the delay between the spoken word and appearance of closed captions, the participants were unable to properly store the information from the news segments for knowledge acquisition and retention. Increased information retention allows individuals to better participate in the news democracy, which is the “sequential relationship in which news consumption is said to increase political knowledge that in turn increases political engagement” (Woodstock, 2013, p. 835).
Expanding the notion of the news democracy to all sects of a community, an individual engages in their community by being informed. Individuals can contribute and participate in the conversation about what is going in their community without feeling left out. However, when the news does not reach a portion of the community, they are left un- or misinformed and unable to fully participate not only in the conversation, but also in the community. This study points to a need for stricter enforcement of the FCC regulations for closed captions to aid not only DHH individuals, but also all consumers of news, in their retention of information from news segments.

**Discussion**

Participants did not have high levels of information retention from the three news segments, as shown by the low overall scores on the recall questionnaire. While participants fixated on the different AOIs in the stimuli, including the closed captions, it does not appear that they properly stored the information for recall, as demonstrated by their low scores of correctly answered recall questions. The results of this study lend support to the theories of Information Overload and Lang’s Limited Capacity Model of Motivated Mediated Message Processing (LC4MP). Information Overload Theory assumes that cognitive and sensory processing of information can become “overloaded” when there is an excessive amount of information presented (Pavolik, 2015). There is no doubt that a news segment delivers an overload of information in one segment. For example, in Figure 10, there are four different sources of information in the segment, not including the audio of spoken words.
Figure 10. A screenshot from the KOLO 8 news segment with circles and arrows to identify different information sources.

The visuals in this segment change, showing different individuals interviewed and individuals in the community participating in the event. This is one example of one news segment with many different sources of information. Other segments might include a runner at the bottom of the screen, which has different facts or headlines running along the bottom of the screen. Additionally, segments might feature a graph or box with statistics to add to the information they are reporting on. Evidently, there are many sources of information within one news segment. Because of this, it can be difficult for some individuals to fully process the delivered information. Sweller (1988) argues that working memory only has the capacity to process seven pieces of information at a time. Additionally, Lang argues in LC4MP that consumers of news process information with limited cognitive capacities (Lang, 2000; Lang, 2006; Opgnehaffen & d’Haenens, 2011). Returning to the filing cabinet metaphor, if something goes wrong in the LC4MP process, where perhaps one step is skipped, it becomes difficult to recall the information. Combine this effect with Information Overload Theory and it is not difficult to see why participants had trouble recalling the information for the recall questionnaire. Therefore, the consumers are already at a
disadvantage when processing information from a news segment. While viewing the different news segments, the participants continually diverted their attention from the closed captions in order to process the different sources of textual and visual information in the segment (see Figures 11 and 12).

*Figure 11. A heatmap of the KOLO 8 news segment illustrating where participants fixated during their viewing of the segment. Red indicates where the participants fixated the most, while green and yellow indicate lower levels of fixation.*
Presumably, because their attention and cognitive processes were continually diverted, they were not able to encode and store the information properly. When they were asked to recall the information, they were unable to do so as they did not devote enough cognitive resources to the process of consuming news. It is apparent that the participants did not devote their full attention to only one aspect of the news segment, like the closed captions, audio or visuals; therefore, they were unable to fully retain the information from the news segments that they watched. In the open-ended responses to the attitudinal questionnaire, many participants claimed that they were able to understand the overall message of the news segments, but were unable to remember specific details of the segments.

A recurring topic mentioned in many of the open-ended responses to the attitudinal questionnaire is the lag, or delay, of the closed captions with the audio. It is
clear that the captions did not meet one aspect of the FCC’s (2018) regulations for closed captions: synchrony. The closed captions and the spoken dialogue were not in sync. Multiple participants stated that the delay between the spoken dialogue and the closed captions became distracting, as they had attempted to read and listen at the same time. Upon being asked if all the information necessary to understand the clips were in the captions, one participant responded with:

“No, definitely not. The captions were lagging, I didn't know who was speaking, overall I wouldn't be able to recollect any information from those clips except for the main points: Airline, halloween [sic] haunted house, and special olympics [sic]. *Honestly, no captions would be better than horrible captions for some of them.*” (emphasis mine)

The delay is an aspect of the closed captions that the local news stations can and must improve upon. Often, the segments are pre-scripted or pre-recorded, therefore the only issue should be ensuring that the closed captions are timed properly with the spoken word. A delay is unavoidable, as the speed of speech from a reporter or an interviewee are unpredictable. However, it should be possible to reduce the delay to a minimum. The “Special Olympics” segment from KOLO 8 had the least amount of delay from the spoken dialogue to the closed captions, with only fluctuating delays of one- to three-seconds. This segment featured not only an anchor, but two interviewees. An example of a significant delay is the four- to seven-second delay found in the “Haunted House” segment from News 4 and FOX 11. This segment featured one anchor and one interviewee. It is important to also note that the News 4 and FOX 11 segment did not have accurate closed captions appear until 14 seconds
into the segment, which might explain why the delay was so significant. If the captions began with the first current spoken words from the anchor, rather than trying to catch up from the beginning of the spoken word, the delay would have been decreased.

This study calls for stricter enforcement of the FCC’s 2018 regulations for closed captions rather than new regulations. The local news segments investigated in this study were not in full compliance with the existing regulations. None of the news segments included in this study met the regulations in full. While some segments came close to being fully accurate or having little delay in their captions of the spoken word, no segment met the regulations defined by the FCC. The regulations from the FCC are in place to make not just news segments, but all video programming fully accessible to the DHH population. Clearly, the participants felt that the videos were not fully accessible, as they were unable to follow along. In response to an attitudinal question, one participant stated, “I was trying to read what the captions were saying, the reporters would speak too fast so my brain was distracted. I think I would be able to follow along more efficiently if the audio was muted and I was reading” (emphasis mine). This is a significant issue, as it appears that the closed captions are not serving the purpose they are meant to serve. The closed captions are lacking in one or many ways, in regards to accuracy, completion, synchrony and placement. Perhaps if we tackle one issue at a time, the information would be more accessible for the DHH. If we can achieve a delay reduction, presumably the participants would not have been as distracted by trying to follow along with the captions or the audio – they might have been able to focus their
attention on one aspect and to capture more information. Similarly, if the captions were accurate, there would be no question that the information delivered was correct – it would only be a matter whether the participant understood the information correctly and properly stored the information for retention. In this study, that was not the case, as all segments had an issue with all or some of the FCC’s 2018 requirements for closed captions.

Recently, CNN fact-checked White House Press Secretary Sarah Huckabee Sanders while she was live on air, delivering a statement on climate change (Moran, 2018, par. 1 and 2). CNN split their screen to run a graphic of bulleted facts, side-by-side to Sanders on air (see Figure 13).

![Figure 13. A screenshot of the fact-checking conducted by CNN while White House Press Secretary Sarah Huckabee Sanders was live on air delivering a statement on climate change.](image)

A problem arises in that the DHH population may not be able to ascertain whether the bullet points presented by CNN were provided because of Sarah Huckabee Sanders or the media station itself. Someone who is not DHH may be able to understand the difference immediately, as they will be able to hear Sander’s statement and compare
it to the bullets. But, a DHH individual may not be able to do so and may not be able to fully process both sources of information being delivered, especially since in this case, they were in contrast to each other. This recent event further suggests why this is such an important and timely issue. Now more than ever, it is important to ensure all information presented is accessible to the entire population.

Limitations and Recommendations for Future Studies

While this study produced significant results regarding the accessibility of news, there were some limitations. The first limitation is the small sample size. The smaller sample size of participants meant that some categories were unrepresented in terms of demographics. Because a large portion of the participants were recruited from the University of Nevada, Reno, many of the participants were in the 18 to 24 year old age range, with very few others representing the other age groups. A larger recruitment effort around the local community in Reno, Nevada and in surrounding communities might have helped address this issue.

Another limitation is the news segments selected for the stimuli. Because the news segments were selected from the four local television stations in Reno, Nevada, it is possible that there may have been a level of familiarity with the news segments or topics. Some of the participants might have been familiar with the anchors or the organizations recognized in the news segments. A potential solution to avoid familiarity might be creating an original news segment to have control over the content of the story, as well as the technical and production elements, including the closed captions. A possible future project might involve adding the closed captions
into an original news segment to control the placement and speed of the captions to address specific aspects of closed captioning.

The recall questionnaire included detailed questions regarding the news segment, as well as information that might have not been pertinent to understanding the content of the segment. For example, one question asked how big the haunted house was in square feet, while another question asked the color of the reporter’s tie. This information may not be useful to a viewer of the news segment, as that may not be information they are paying attention to. In the case of the news segment “Haunted house raises money for Boys and Girls Club,” a viewer might be more concerned with knowing the days and times that the haunted house runs, rather than how big it is. A possible solution to this limitation might be running more pilot participants and asking feedback to the types of questions included in the recall questionnaire. Recall questions based only on textual information as well as only on visual information could be useful for future studies.

Additionally, viewers might have had different motivations for what to pay attention to while they watched the segments. Before watching the news segments, each participant was notified that the study focused on the effectiveness of closed captioning. While this did not mean that the participants solely focused on the closed captions during the viewing of the news segments, some participants might have taken that information as a guide for their viewing of the news segments. A possible solution to this might be to omit the information regarding the focus of the study until the debriefing of the participant, after the viewing of the news segments.
The provided closed captions in each of the news segment can be considered as a limitation in this study as well. All of the news segments included in the study feature different standards for closed captions, based on the placement of the captions, size of the text, color of the text and text box, accuracy, and speed of the captions. Due to the variety of closed captions provided, it can be difficult to ascertain which aspects of the captions might have made it difficult to fully understand the message in the news segments, solely based on reliance on the closed captions. A possible solution to this might be to carefully select the news segments in order to match the closed captions on one aspect, such as speed of captions or accuracy. Future studies might consider creating an original news segment to control the different aspects of closed captioning.

Despite the different limitations, this study produced relevant results concerning accessibility of online television news. The participants in this study were unable to retain information after viewing local news segments from television news stations, even when closed captions were provided. The closed captions did not meet the requirements defined by the FCC (2018) and as a result, led to a decline of knowledge acquisition by their DHH viewers. Television news stations, as well as journalists, must work hard in their role to ensure all communities are well-informed to participate. As the fourth estate, it is the responsibility of journalists to give everyone the choice to participate in their community as educated and informed community members. With an informed community, they will have the ability to engage and participate in the news democracy narrative as active citizens.
References


communication and political information processing (pp. 69-83). Hillsdale, NJ: Erlbaum.


Tables and Appendices

Appendix A: Commercial Transcripts of News Segments

New Airline to Service Reno-Tahoe International Airport

THE HOLIDAYS THE RENO TAHOE INTERNATIONAL AIRPORT IS WELCOMING THEIR TENTH AIRLINE. CALIFORNIA PACIFIC AIRLINE OFFERS 4 NON-STOP FLIGHTS A WEEK TO CARLSBAD MCCLELLAN-PALOMAR AIRPORT..... JUST NORTH OF SAN DIEGO AND THE HOME OF LEGOLAND. TO CELEBRATE THE FIRST FLIGHT TODAY THE AIRPORT HELD A LEGO THEMED WORKSHOP. FEATURING CUPCAKES AND FUN INTERACTIVE BUILDING GAMES FOR THE KIDS.

Marily More- CEO of The Reno Tahoe Airport: “We want to welcome tourists coming in here, but we want to make sure our local residents are also using this service to go to the San Diego area. Today we are promoting the fact that this is very close to Lego land.”

THE JET HOLDS UP TO 50 PASSENGERS AND FOCUSES ON WEST COAST ROUTES. THEY’LL BE STARTING FLIGHTS FROM CARLSBAD TO LAS VEGAS ON
Haunted house raises money for Boys and Girls Club

FULL FORECAST.

>>> SOMEONE IS GETTING INTO THE SPIRIT. ONE FAMILY IS USING THE HALLOWEEN SPIRIT TO RAISE MONEY FOR THE BOYS AND GIRLS CLUB. THIS HAUNTED HOUSE IS ON LOW DRIVE. 1395 ROYAL DRIVE. IT IS KID FRIENDLY. A DIFFERENT ROOMS THROUGHOUT THE HOUSE. THE HOUSE WILL FEATURE A PIRATE SHIP BUILT FROM MATERIALS DONATED TO THE FAMILY. LOTS OF SCARY RULES ON THAT ONE. THE FUNDRAISING EVENT STARTED AT 6 PM AND WENT UNTIL 10 PM TONIGHT.

>>> EVERY YEAR IT HAS GOTTEN BIGGER AND MORE ELABORATE. THIS IS THE BIGGEST SO FAR. WELL OVER 1000 SQUARE FEET. A DIFFERENT ZONES. IT IS REALLY BUILT FOR KIDS. MY TWO AND FOUR-YEAR-OLD ARE THE FOREMAN’S SUPERVISOR OF THE PROJECT. IT IS VERY MUCH FOR KIDS.

>>> GOOD FOR
Special Olympics bowling

NIGHT AT THE BOWLING STADIUM – BENEFITTING SPECIAL OLYMPICS NEVADA. SUPPORTERS PACKED THE NATIONAL BOWLING STADIUM – ALONG WITH CURRENT SPECIAL OLYMPIANS. THIS IS AN ANNUAL EVENT THAT HELPS PROVIDE TRANSPORTATION – UNIFORMS – TRAINING AND OTHER NECESSARY SPORTS AND HEALTH PROGRAMS FOR THOUSANDS OF PARTICIPANTS.

“Things like this..this is the fundraiser, this is how we keep them playing sports and competitions and all the other programs we offer our athletes.”

“It gives us a time to be with our friends, meet new people, bowl with people we like and have fun in the community.”

THE SPECIAL OLYMPICS HELPS MORE THAN 3 THOUSAND CHILDREN AND ADULTS WITH INTELLECTUAL DISABILITIES ACROSS NEVADA. LET’S PRAY FOR FOX AFFILIATES AROUND THE
Appendix B: Accurate Transcripts of News Segments
New Airline to Service Reno-Tahoe International Airport

[Channel 2 theme plays.]

*Landon Miller:* Just in time for the holidays, the Reno-Tahoe International Airport is welcoming their tenth airline. California-Pacific Airline offers four nonstop flights a week to Carlsbad McClellan-Palomar Airport that's just north of San Diego. And, it's also the home of LegoLand.

To celebrate the first flight today, the airport held a Lego-themed workshop featuring cupcakes and fun interactive building games all for the kids.

*Marily Mora:* We want to welcome tourists coming in here, but we also want to make sure our local residents are also using the service to really go to the San Diego area. Today, we're promoting the fact that this is very close to LegoLand.

*Male Speaker:* I was -- [cut off.]

*Landon Miller:* The jet holds up to 50 passengers and focuses on west coast routes. They'll start flights from Carlsbad to Las Vegas on November 15th.
Haunted house raises money for Boys and Girls Club

[Machine laughs.]

Anchor: Alright, someone's getting into the spirit. One local family is using the Halloween spirit to raise money for the Boys and Girls Club this week.

This haunted house is on Royal Drive. It's 1395 Royal Drive and it is kid friendly, features eight different rooms throughout the house.

The house will also feature a pirate ship that was built from materials donated to the family. Lots of scary ghouls on that one.

The fundraising event started at 6 o'clock and went up until 10 o'clock tonight.

Charlie Gray: Every year, it's just gotten bigger and more elaborate and this is by far the biggest we've done so far. It's well over 1000 square feet, got eight different zones in it. It's really built for kids. My two- and four-year old are kind of the foremen and supervisor of my project. So, it's very much for kids.

Anchor: Alright, good for him. The haunted house will be open again tomorrow and then on Wednesday and again all the money raised will go the Boys and Girls--
[video cuts off.]
Special Olympics bowling

Anchor: New tonight at 11 o'clock, it's a spook-tacular night at the National Bowling Stadium benefitting Special Olympics Nevada. Supporters packed the National Bowling Stadium along with current Special Olympians. It's an annual event that helps provide transportation, uniforms, training and other necessary sports and health programs for thousands of participants.

Allyce Pearson: Things like this is the fundraiser. This is how we keep them playing sports and competitions and all the other programs that we offer our athletes.

Brandy Goodson: It gives us a time to be with our friends, meet new people, bowl with people we like, and just get out there and have fun in the community.

Anchor: The Special Olympics helps more than 3,000 children and adults with intellectual disabilities across Nevada, great organization there. So, we're talking world series -- [cut off.]
Appendix C: Recall Questionnaires
New Airline to Service Reno-Tahoe International Airport

Q1 How carefully did you pay attention to the message you just watched?

<table>
<thead>
<tr>
<th>Level of Attention</th>
<th>Not Carefully At All</th>
<th>Somewhat Carefully</th>
<th>Very Carefully</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Q2 Who was the name of the reporter?

________________________________________________________________

Q3 What color was the tie the reporter was wearing?

________________________________________________________________

Q4 What was the name of the airline coming to the airport?

- California Pacific Airlines
- GoJet Airlines
- Pacific Airways
- California Jet Airlines
- I don't know
Q5 This is the _____ airline to come to the Reno-Tahoe Airport.

- Eighth (8th)
- Fourteenth (14th)
- Tenth (10th)
- Twelfth (12th)
- I don't know

Q6 Where do they offer flights to?

________________________________________________________________

Q7 How many flights a week does the new airline offer?

- Seven
- Twenty
- Four
- Five
- I don't know

Q8 What workshop did they offer and why?

________________________________________________________________

Q9 What was the color of the T-shirts that the children playing wore?

- Red
- Green
- Blue
- Yellow
- I don't know
Q10 What was the name of the woman interviewed?
________________________________________________________________

Q11 What is the interviewee's position?
________________________________________________________________

Q12 How many passengers does the jet hold?
________________________________________________________________

Q13 On what day did the jet start offering flights?
________________________________________________________________

Q14 When the jet begins to offer flights, will it be from Carlsbad to Reno?
   ○ Yes
   ○ No
   ○ I don't know

Q15 To what extent did you find the message easy to follow?
   ○ Extremely easy
   ○ Somewhat easy
   ○ Neither easy nor difficult
   ○ Slightly difficult
   ○ Moderately difficult
   ○ Extremely difficult
Haunted house to raise money for Boys and Girls Club

Q1 How carefully did you pay attention to the message you just watched?

<table>
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<tr>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Q2 Select three of the decorations the haunted house featured.

- □ Mummy
- □ Witch
- □ Skeleton dog
- □ Skeleton human
- □ Skeleton pirate
- □ Witch's cauldron
- □ Spider
- □ Snake
- □ Saw and other weapons
- □ Dolls
- □ I don't know
Q3 What street is the house located on?

○ Row Street
○ Victory Road
○ Royal Drive
○ Park Drive
○ I don't know

Q4 Is the haunted house kid-friendly?

○ Yes
○ No
○ I don't know

Q5 How many rooms or zones are featured in this haunted house?


Q6 The haunted house is mentioned to feature a:

○ Pirate ship
○ Medical room
○ Zombie experience
○ Corn maze
○ I don't know
Q7 How long did the fundraising event last?

- 4 hours
- 6 hours
- 1 night
- 3 nights
- I don't know

Q8 Who was the name of the male interviewed?

________________________________________________________________

Q9 What was the color of the jacket of the male interviewed?

________________________________________________________________

Q10 What is the interviewee's position?

________________________________________________________________

Q11 How big is the house this year?

- 800 square feet
- 1000 square feet
- 1500 square feet
- 2000 square feet
- I don't know

Q11 Is the family running the house local?

- Yes
- No
- I don't know
Q12 Have you visited this haunted house before?

- Yes
- No
- I don't know

Q12 To what extent did you find the message easy to follow?

- Extremely easy
- Somewhat easy
- Neither easy nor difficult
- Slightly difficult
- Moderately difficult
- Extremely difficult
**Special Olympics bowling**

Q1 How carefully did you pay attention to the message you just watched?

<table>
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<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q2 Which group will the fundraiser benefit?

________________________________________________________________

Q3 What type of costume is the first person shown bowling wearing?

________________________________________________________________

Q4 Where is the fundraiser being held?

- [ ] Coconut Bowl at Wild Island
- [ ] National Bowling Stadium
- [ ] Grand Sierra Resort Bowling Stadium
- [ ] I don't know

Q5 In addition to raising money, why is this event being held?

________________________________________________________________
Q6 How often is this event held?

- Once a month
- Twice a year
- Annually
- Quarterly
- I don't know

Q7 What type of services will this event help provide participants? Select all that apply.

- Provide transportation
- Provide uniforms
- Offer training
- Offer sponsorships
- Offer sports programs
- Offer tutoring
- Offer health programs
- Give donations to families
- I don't know

Q8 What are the names of the two individuals interviewed?

- First individual interviewed
  __________________________________________

- Second individual interviewed
  __________________________________________
Q9 What costume was the second individual interviewed wearing?
______________________________________________________________________

Q10 The first woman interviewed mentioned that this event will _____?
______________________________________________________________________

Q11 True or false: The second woman interviewed said the event is a good time to be with friends and family.
   ○ True
   ○ False
   ○ I don't know

Q12 What type of disability does this event help?
______________________________________________________________________

Q13 How many adults and children does the organization help?
______________________________________________________________________

Q14 To what extent did you find the message easy to follow?
   ○ Extremely easy
   ○ Somewhat easy
   ○ Neither easy nor difficult
   ○ Slightly difficult
   ○ Moderately difficult
   ○ Extremely difficult
Appendix D: Attitudinal Questionnaire

Q1 What is your gender?

- Male
- Female
- Choose not to specify

Q2 What is your age group?

- 18 - 24 years old
- 25 - 34 years old
- 35 - 44 years old
- 45 - 54 years old
- 55 - 64 years old
- 65+ years old
- Choose not to specify

Q3 Are you d/Deaf or hard-of-hearing?

- d/Deaf
- Hard of hearing
- Does not apply

Display This Question:

If Are you d/Deaf or hard-of-hearing? = d/Deaf
Or Are you d/Deaf or hard-of-hearing? = Hard of hearing

Q4 Please describe the extent to your hearing loss.

________________________________________________________________________
________________________________________________________________________
Q3 What year are you in school?

○ Freshman/First year

○ Sophomore/Second year

○ Junior/Third Year

○ Senior/Fourth year

○ Fifth year

○ Graduate student

○ PhD candidate

○ Does not apply

*Skip To: Q4 If What year are you in school? = Does not apply*

*Display This Question:*

*If What year are you in school? = Does not apply*

Q4 If you are not in school, what is your profession?

Q5 What is your main source for news?
Q6 How often do you consume the news?

- Daily
- Every other day
- 3 to 4 times a week
- Weekly
- Biweekly
- Every other week
- Monthly
- Never

The following questions will pertain to this news segment.
Q7 Did you notice a difference in the captions in this segment?

○ Yes
○ No
○ I don't know

Q8 Where were the captions displayed in this news segment?

○ Upper left corner
○ Upper center
○ Upper right corner
○ Middle left
○ Center of the screen
○ Middle right
○ Lower left corner
○ Lower center
○ Lower right corner
○ I don't know

Q9 Did the placement of the captions have an effect on understanding the content of the segment? If so, what was the effect?

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
Q10 Was it clear in the captions when there was a new speaker speaking?
   - Yes
   - No
   - I don't know

Q11 Was it clear in the captions if there were any pauses for emphasis?
   - Yes
   - No
   - I don't know

The following questions will pertain to this news segment.

Q12 Did you notice a difference in the captions in this segment?
   - Yes
   - No
   - I don't know
Q13 Where were the captions displayed in this news segment?

- Upper left corner
- Upper center
- Upper right corner
- Middle left
- Center of the screen
- Middle right
- Lower left corner
- Lower center
- Lower right corner
- I don't know

Q14 Did the placement of the captions have an effect on understanding the content of the segment? If so, what was the effect?

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

Q15 Was it clear in the captions when there was a new speaker speaking?

- Yes
- No
- I don't know
Q16 Was it clear in the captions if there were any pauses for emphasis?

- Yes
- No
- I don't know

The following questions will pertain to this news segment.
Q17 Did you notice a difference in the captions in this segment?

- Yes
- No
- I don't know

Q18 Where were the captions displayed in this news segment?

- Upper left corner
- Upper center
- Upper right corner
- Middle left
- Center of the screen
- Middle right
- Lower left corner
- Lower center
- Lower right corner
- I don't know

Q19 Did the placement of the captions have an effect on understanding the content of the segment? If so, what was the effect?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Q20 Was it clear in the captions when there was a new speaker speaking?

○ Yes
○ No
○ I don't know

Q21 Was it clear in the captions if there were any pauses for emphasis?

○ Yes
○ No
○ I don't know

Q22 In regards to all of the news segments watched, do you believe all the information necessary to understand the clips were provided in the captions? Why or why not?

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
Appendix E: Institutional Review Board Exemption Form

DATE: January 7, 2019
TO: Laura Crosswell, PhD
FROM: University of Nevada, Reno Institutional Review Board (IRB)

PROJECT TITLE: [1345327-1] ADA Compliancy in Television News: Increasing Information Retention for the Hearing Impaired in the Consumption of News (Tentative)
REFERENCE #: Social Behavioral
SUBMISSION TYPE: New Project
ACTION: DETERMINATION OF EXEMPT STATUS
REVIEW TYPE: Exempt
DECISION DATE: January 7, 2019
REVIEW CATEGORY: Exemption Category #2

An IRB member has reviewed this project and has determined it is EXEMPT FROM IRB REVIEW according to federal regulations. Please note, the federal government has identified certain categories of research involving human subjects that qualify for exemption from federal regulations.

Only the IRB has been designated by the University to make a determination that a study is exempt from federal regulations. The above-referenced protocol was reviewed and the research deemed eligible to proceed in accordance with the requirements of the Code of Federal Regulations on the Protection of Human Subjects (45 CFR 46.101).

Reviewed Documents

Advertisement - Email Call for Participants.docx (UPDATED: 11/17/2018)
Application Form - Exempt IRBFlex Min Risk No Federal Support 111518.docx (UPDATED: 11/15/2018)
Consent Form - Script.docx (UPDATED: 11/17/2018)
Consent Form - Consent to Participate in Study.docx (UPDATED: 11/15/2018)
Protocol - HURA_FIN.docx (UPDATED: 11/15/2018)
Questionnaire/Survey - Stimuli Questions and Survey Questions.docx (UPDATED: 11/17/2018)
University of Nevada, Reno - Part I, Cover Sheet - University of Nevada, Reno - Part I, Cover Sheet (UPDATED: 11/15/2018)

If you have any questions, please contact Nancy Moody at 775.327.2367 or at nmoody@unr.edu.

NOTE for VA Researchers: You are not approved to begin this research until you receive an approval letter from the VASNHCS Associate Chief of Staff for Research stating that your research has been approved by the Research and Development Committee.

Sincerely,
Appendix F: Consent to Participate in Study Form
Appendix G: Debriefing Document

Debriefing Document

Thank you for participating in this study. We want to inform all participants that we used Tobii Eye tracking software to track your eye movements during the advertisement viewing portion of this study. The eye tracking software will help us better understand viewer gaze during news segments. If you feel uncomfortable with your eye movements being tracked during this study, we can omit your data from our analysis. Our eye tracking technology also has video recording capabilities that capture user actions as they are viewing stimuli. These videos will not be used in any publication materials and are for research purpose only.

Questions/Concerns?
You may ask about your rights as a research participant. If you have questions, concerns, or complaints about this research, you may report them (anonymously if you so choose) by calling the University of Nevada, Reno Research Integrity Office at (775) 327-2368.

You may also ask questions of the researcher at any time by calling Mackenzie Barrett at (775) 843-7844 or emailing her at mbarrett0826@nevada.unr.edu.
Appendix H: Email Call for Participants

EMAIL TO STUDENTS

Subject: Are you d/Deaf or hard-of-hearing and would like the chance to win a $50 Amazon Gift Card?

Hello!

My name is Mackenzie Barrett and I am a senior in the Honors Program at the University of Nevada, Reno. I’m currently working on my thesis research and am in dire need of participants!

My thesis topic focuses on local television news and audience retention of information. I’m looking for d/Deaf or hard-of-hearing individuals who will watch three short news segments and answer four questionnaires regarding the news segments. All I need, in total, is about 20 – 30 minutes of your time.

If you are d/Deaf or hard-of-hearing, or know someone who is, would you be willing to participate in my study? Each participant will receive a $15 Amazon Gift Card. Once the study is completed, all participants will be entered into a grand prize raffle for a $50 Amazon Gift Card.

If you are interested in participating, please email me at mbarrett0826@nevada.unr.edu or reach me by phone at (775) 843-7844. I’d be more than happy to schedule a time for you to participate!

Your participation is voluntary. Individual response will be kept confidential and will not be tied with any identifying information. You may also withdraw from the study at any time.

This project has been approved by the University of Nevada, Reno Research Integrity Office for Research with Human Subjects. They can be contacted at (775) 327-2368.

If you have any questions regarding this study, I would be happy to address them! You can email me at mbarrett0826@nevada.unr.edu or reach me by phone at (775) 843-7844.

Thank you!

Warm regards,
Mackenzie Barrett
mbarrett0826@nevada.unr.edu
(775) 843-7844
EMAIL TO PROFESSORS

Subject: Looking for help to recruit d/Deaf or hard-of-hearing students for my research!

Hello!

My name is Mackenzie Barrett and I am a senior in the Honors Program at the University of Nevada, Reno. currently working on my thesis research with the help of my mentor, Dr. Laura Crosswell. I am in dire need of help to recruit students for my research and I am hoping that you will be able to provide some assistance!

My thesis topic focuses on local television news and audience retention of information. I’m looking for d/Deaf or hard-of-hearing individuals who will watch three short news segments and answer four questionnaires regarding the news segments. All I need, in total, is about 20 – 30 minutes of a participant’s time.

Each participant will receive a $15 Amazon Gift Card. Once the study is completed, all participants will be entered into a grand prize raffle for a $50 Amazon Gift Card.

If possible, can you please forward and/or send the following email below to them? I’d love to increase my reach to students in order to recruit. If you are able to do so, I greatly appreciate your help! Additionally, I’d like to mention that participation in this study is open to both students and faculty alike.

If you have any questions or concerns, please feel free to email me, Dr. Crosswell, or contact me via cell phone: (775) 843-7844. I look forward to hearing from you!

Thank you for your time,

Mackenzie Barrett, Student Co-Investigator
Honors Student at the University of Nevada, Reno
mbarrett0826@nevada.unr.edu
(775) 843-7844

Dr. Laura Crosswell, Principal Investigator
Assistant Director of the Center for Advanced Media Studies at the Reynolds School of Journalism
University of Nevada, Reno
lcrosswell@unr.edu
(864) 710-0092

This project has been approved by the University of Nevada, Reno Research Integrity Office. The office can be contacted at (775) 327-2368.
Email to forward to students:

**Subject: Are you d/Deaf or hard-of-hearing and would like the chance to win a $50 Amazon Gift Card?**

Hello!

My name is Mackenzie Barrett and I am a senior in the Honors Program at the University of Nevada, Reno. I’m currently working on my thesis research and am in dire need of participants!

My thesis topic focuses on local television news and audience retention of information. I’m looking for d/Deaf or hard-of-hearing individuals who will watch three short news segments and answer four questionnaires regarding the news segments. All I need, in total, is about 20 – 30 minutes of your time.

If you are d/Deaf or hard-of-hearing, or know someone who is, would you be willing to participate in my study? Each participant will receive a **$15 Amazon Gift Card**. Once the study is completed, all participants will be entered into a grand prize raffle for a **$50 Amazon Gift Card**.

If you are interested in participating, please email me at mbarrett0826@nevada.unr.edu or reach me by phone at (775) 843-7844. I’d be more than happy to schedule a time for you to participate!

Your participation is voluntary. Individual response will be kept confidential and will not be tied with any identifying information. You may also withdraw from the study at any time.

This project has been approved by the University of Nevada, Reno Research Integrity Office for Research with Human Subjects. They can be contacted at (775) 327-2368.

If you have any questions regarding this study, I would be happy to address them! You can email me at mbarrett0826@nevada.unr.edu or reach me by phone at (775) 843-7844.

Thank you!

Warm regards,
Mackenzie Barrett
mbarrett0826@nevada.unr.edu
(775) 843-7844
Appendix I: Script

Upon Arrival

Hello! My name is Mackenzie and I am the researcher who will be conducting the study today. Please show me a form of identification so that I may confirm your appointment. A government-issued ID or student ID will work.

Great! This is the participation consent form. Please read through it before you sign. Once you sign the consent form, we can get you started.

We’ll be conducting a two-part study today consisting of videos and surveys. This should take roughly 15-20 minutes, but it does vary.

First, you will watch three news segments. Then, you will complete three quizzes about each of the segments. Afterwards, you will complete the post-test survey.

I’m going to use a random number generator to give you a number. Here is your number. I’ll write it down on a post-it note. Please keep this ready for the surveys.

Do you have any questions so far?

Please sit in front of this computer. I’d like to have your body facing this screen. I’m doing a few configurations here, just to make sure you are close enough to the screen.

A red dot will show up on the screen. Follow that with your eyes.

Now that you are all configured, you can begin to watch the videos. Press the space bar when you are ready.

Once all the videos have been played, the software will close. You can turn to the screen next to you and begin the survey once you are ready.

When the survey asks for your number, please put in the number I gave you.

Do you have any questions? If you have questions that come up, I’ll be readily available near the lab.

After Test and Survey Completion

Thank you for taking part in my study! Here is a debriefing document.

Today, we tested for information retention among d/Deaf and hard-of-hearing individuals for local news stations. We utilized eye-tracking technology as a secondary measure for data, in addition to the survey.
If you have any questions about the technology or would like us to not include your data in the research, my contact information is on the document.

Here is the $15 Amazon Gift Card for your participation. Please keep a look-out on your email for emails from me.

Once all participants have completed the study, we will be doing a raffle for a grand prize of a $50 Amazon Gift Card.

Please contact me if you have any questions that come up. Thank you and have a good day!