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A survey of those in the U.S. Deaf community about reading and writing ASL

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A SURVEY OF THOSE IN THE U.S. DEAF COMMUNITY ABOUT READING AND
WRITING ASL

by

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This thesis, submitted by Jennifer Keogh in partial fulfillment of the requirements for the Degree of Master of Arts from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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This thesis meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

_____
Wayne Swisher
Dean of the Graduate School

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Date

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Department   Linguistics

Degree   Master of Arts

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Signature   Jennifer Keogh

Date   July 29, 2013

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To J Richard Lawrence

ABBREVIATIONS

ASL	American Sign Language
df	Degrees of Freedom
H_0	The null Hypothesis
H_A	The alternative hypothesis
L1	A language user's first or primary language
L2	A language user's second language
LIP	The linguistic interdependence principle
n	The number of respondents
ns	Not significant
χ^2	Chi-square

ABSTRACT

On average, students who are deaf do not develop English literacy skills as well as their hearing peers. The linguistic interdependence principle suggests that literacy in American Sign Language (ASL) may improve literacy in English for students who are deaf. However, the Deaf community in the United States has not widely adopted a written form of ASL. This research surveys individuals in the U.S. Deaf community to better understand the opinions surrounding literacy in ASL.

The survey was presented online, containing both ASL in embedded videos and written English. The survey asked for the participants' demographic information, language and educational background, opinions about reading and writing ASL, and opinions on specific writing systems. Sixty-two surveys were analyzed using Chi-square Goodness of Fit tests and Tests of Independence.

The results show that those who desire to read and write ASL are in the minority. The respondents were evenly divided among those who supported literacy in ASL, those who opposed it, and those who felt ambivalent about it. The factors that influenced their opinions were (1) the widespread use of a written form of ASL; (2) the value of literacy in ASL; (3) the style of a writing system; (4) writing with other Deaf individuals; (5) the face-to-face culture in the Deaf community; (6) video technology; and (7) the dominance of English. The respondents were highly educated, which may have influenced these results. Surveying a more representative population is necessary to better understand the opinions about literacy in ASL in the U.S. Deaf community.

CHAPTER 1

INTRODUCTION

In the United States, the majority of students who are deaf struggle with acquiring literacy in English. Bilingual education that uses American Sign Language (ASL) as the language of instruction and English for print literacy has attempted to improve the English literacy abilities of students who are deaf, but there is little evidence to support its success. Print literacy in ASL may help improve bilingual education by providing a bridge from ASL to written English. Some educators and researchers have used a written form of ASL in the education of students who are deaf. Despite the potential of print literacy in ASL to improve English literacy and the existence of several writing systems for ASL, the U.S. Deaf community has not widely accepted print literacy. Given the potential for print literacy in ASL to provide the skills for a more complete biliteracy with English, what are the opinions of those in the U.S. Deaf community about print literacy in ASL?

This thesis enriches the research on bilingual education by surveying those in the Deaf community to evaluate the community's desire for reading and writing ASL.

The survey results show that the respondents were evenly divided among those who strongly supported print literacy in ASL, those who strongly opposed it, and those who felt ambivalent. The proponents and ambivalent respondents recognized that print literacy could improve language preservation, bilingual education, and communication with other Deaf individuals. Ambivalent respondents and opponents did not desire

literacy in ASL because of the necessity and preference for written English, the use of technology, and the lack of a critical mass of those who read and write ASL. Some opponents also felt that ASL should not be written because of the face-to-face culture of the Deaf community.

The survey respondents, who expressed these rival views, were highly educated. The survey's advertising and online nature may have unintentionally biased the set of potential respondents to individuals who have a high school degree and who have a strong command of English. A larger sample size with more individuals, who did not obtain a high school diploma or GED or who do not feel comfortable with English, may have produced a different outcome. Therefore, more research into the opinions of those in the U.S. Deaf community is needed to support a successful application of a written form of ASL in bilingual education for students who are deaf.

1.1 Summary of the Chapters

This chapter defines key terms that are used in this thesis. The second chapter presents the rationale for the survey of the U.S. Deaf community regarding reading and writing ASL. Chapter 3 describes the methodology for advertising, designing, and analyzing the survey. Chapter 4 discusses the demographics, backgrounds, and general opinions of the respondents. Chapter 5 discusses the opinions of specific writing systems and possible influences on the respondents' desires for reading and writing ASL. Chapter 6 summarizes the factors on the opinions of the respondents, discusses the limitations of this research, and proposes next steps.

1.2 Definitions

The use of certain terms varies within the literature about education for students who are deaf, the literature about linguistics, and the literature about the U.S. Deaf community. This section defines the terms used throughout this thesis.

1.2.1 Deaf

Scholars typically use capitalization to distinguish the concepts of audiological deafness and cultural deafness (Schein 1989; Lane, Hoffmeister & Bahan 1996; Padden & Humphries 2005). The lowercase "deaf" refers to a physical characteristic. The capital "Deaf" refers to the culture shared by certain individuals who are deaf or hard-of-hearing and the community these individuals compose. This convention is used in this thesis.

1.2.2 ASL

American Sign Language (ASL) is the primary language of the Deaf community in the United States. ASL, however, has not always been recognized as a language. The language used by the U.S. Deaf community was first analyzed as a language and named ASL just over fifty years ago (Stokoe 2005; Padden & Humphries 2005). The 1960 groundbreaking work, *Sign Language Structure: An Outline of the Visual Communication Systems of the American Deaf*, demonstrated that ASL could be linguistically analyzed and that it was a complete language. ASL (and other sign languages) differs from English (and other spoken languages) in modality, the way a language is produced and received; nevertheless, ASL shares with spoken languages the linguistic components that make up all languages. ASL "uses visually-based complex

inflectional and derivational systems to encode aspect, spatial relationships, pronominal agreement, adverbial markers, and in some cases form class" (Lederberg, Schick & Spencer 2013:16). It is acquired naturally as a first language by children born to parents who use ASL fluently, just like hearing children acquire the spoken language of their parents (Lederberg, Schick & Spencer 2013).

However, even today, some people assume that ASL is pantomime or simple gesturing, that there is one universal sign language, or that ASL is based on English (Battison 2003). As shown above, ASL is a language. It is distinct from other sign languages used throughout the world. ASL is not based on English. Manually-coded English systems (MCE) are based on English and attempt to encode English syntax and morphology using signs from ASL. Some individuals use a combination of ASL and English, or pidgin, to facilitate communication between people who use ASL and people who use English. This communication strategy does not mean that ASL is based on English.

In this thesis, ASL therefore specifically refers to the linguistically and culturally recognized complete language.

1.2.3 The U.S. Deaf Community

In the U.S., the Deaf community is its own separate community. Its distinct language, values, and culture set it apart from the majority culture. "American Deaf culture centers on the use of ASL and identification and unity with other people who are Deaf" (Gallaudet University 2013). ASL distinguishes the community as a linguistic minority. In addition to language, the values of the Deaf community make it distinct. While the dominant culture in U.S. values individualism, which emphasizes uniqueness

and privacy, the Deaf community values collectivism, which emphasizes finding things in common and not withholding information. "Deaf culture highly values being interconnected with all of its members" (Siple et al. 2003).

The way that Deaf culture is transmitted makes it distinct. Deaf culture does not often pass from parent to child but from Deaf individual to Deaf individual because the majority of children who are deaf are born to hearing parents who are not a part of the Deaf community (Reagan 1985; Schein 1989; Lane, Hoffmeister & Bahan 1996; Karchmer & Mitchell 2004). Deaf culture is transmitted through a "variety of traditions, including films, folklore, literature, athletics, poetry, celebrations, clubs, organizations, theaters, and school reunions" (Gallaudet University 2013).

1.2.4   Oral

In the U.S. Deaf community, "oral" carries negative connotations. "Oral" and "oralist" often refer to the method and theory of education that strictly prohibits use of ASL or any signing system (Baynton 1996; Padden & Humphries 2005). In contrast, in academic discussions about literacy, "oral culture" and "orality" refer to a language group that communicates culture, values, history, and stories in their language face-to-face rather than through written forms. The U.S. Deaf community has passed down stories, history, and values of Deaf culture through face-to-face ASL. Bahan (2006) proposes using "face-to-face" rather than "oral" to describe the U.S. Deaf community to avoid the negative connotations. This thesis follows that practice.

1.2.5 Primary Language

This research and thesis use the phrase "primary language" to refer to the language that an individual uses most often and that is one's default language. This concept is also known as "mother-tongue" language or first language (L1). However, for many individuals who are deaf, ASL was not the first language they were exposed to, nor is it the language used by their immediate biological family. Many people who are deaf must learn ASL indirectly from other Deaf people later in their lives. Nevertheless, ASL becomes the default language for most people who are deaf in the United States. Therefore, "primary language" best describes ASL in relationship to its users.

In this thesis, "primary language literacy" consequently refers to print literacy in an individual's preferred language.

1.2.6 Literacy

The term "literacy" has been used to refer to many aspects of language use and cultural knowledge throughout scholarly literature. For example, Christie and Wilkins (1997:57) used the term "literacy in ASL" to refer to three distinct concepts: (1) functional literacy, the proficient ability to express oneself in ASL; (2) cultural literacy, knowledge of the "values, heritage, and shared experiences"; and (3) critical literacy, the "use of literature as a means of empowerment". However, this study limits the definition of literacy to "print literacy, specifically the ability to read and write" (Lederberg, Schick & Spencer 2013). In the survey on which this thesis is based, this concept was described to survey participants as READ-WRITE ASL and was explained in both ASL and written English (back-translated from ASL) as:

What does it mean to read and write ASL? Like how

people can write down what they speak or think in English

and then read the same thing again later, people can do that

same with what they think and sign in ASL.

This thesis continues to use "literacy" to mean "print literacy".

1.2.7 Survey Jargon

This thesis uses terminology specific to survey question construction.

Closed-ended questions have answer sets that are limited to specific choices that the researcher predetermines. Open-ended questions, in contrast, allow the respondents to write in any answer. Closed-ended questions limit responses to a fixed few; open-ended questions grant as wide a range of responses as the number of the participants.

Single-selection and multiple-selection describe the number of answers the respondents can choose in a closed-ended question. Single-selection indicates that the respondents can choose only one of the answers from the predetermined answer set. Multiple-selection means the respondents can choose more than one of the answers.

Answer sets composed of choices along a spectrum are known as "scalar" questions. This thesis uses "agree-scalar" to refer to the "Agree Strongly, Agree, Disagree, and Disagree Strongly" answer set.

The survey used all of the above types of questions.

1.2.8 Prelingual and Preliterate

"Prelingual" and "preliterate" refer to the age of the onset of deafness. The term "prelingual" refers to those who became deaf before the age of three. The term

"preliterate" refers to those who became deaf before they learned to read and write a spoken language.

1.2.9 *"Emic" and "Etic"*

Borrowing from the linguistic terms "phonemic" and "phonetic", the discipline of anthropology uses "emic" to represent the study of a community's behaviors from *inside* the community and "etic" to represent the scholarly study of those behaviors from *outside* of the community (Pike 1954:37). In this thesis, "emic" refers to the opinions expressed in the survey by those in the Deaf community, and "etic" refers to the perspective of the hearing researcher who has studied Deaf culture and ASL but is not a member of the Deaf community. The researcher developed the closed-ended questions, which gave these questions an etic perspective. The written-in responses to the open-ended questions show the emic perspective: the participants' understanding as to why the community should or should not adopt a written form of ASL.

CHAPTER 2

RATIONALE

Students who are deaf have poor academic performance in comparison to their hearing peers (Spencer & Marschark 2010; Mitchell & Karchmer 2011). The majority of these students struggle to acquire literacy in English regardless of the language environment at home, use of advanced technology, or educational approach (Spencer & Marschark 2010). One educational approach is bilingual education that uses ASL for face-to-face classroom instruction and English for print literacy activities. However, there is little evidence to show that this form of bilingual education improves English literacy acquisition. This may be in part because these programs do not develop print literacy through ASL. Many students who are deaf do not have sufficient access to face-to-face English and thus find it harder to acquire English literacy skills. If students learned to read and write ASL, which they learn face-to-face, then they may be able to form a bridge to literacy in English. The U.S. Deaf community, however, has not widely adopted a written form of ASL that could be used in bilingual education. This thesis research looks to identify how those in the community feel about reading and writing ASL and factors that influence their opinions.

2.1　Poor Performance in Education

The majority of students who are deaf develop insufficient reading and writing skills in English. These students commonly struggle with reading comprehension, English grammar, and expressing themselves well in written English (Spencer & Marschark 2010). For such students, "average literacy outcomes have remained significantly below those of hearing children for many decades despite increased emphasis on their achievement and multiple changes in educational interventions" (Lederberg, Schick & Spencer 2013:23). A study of the Stanford Achievement Test of students who are deaf and hard-of-hearing reveals:

> The median Reading Comprehension scores, by age, for the
>
> entire group of deaf and hard-of-hearing students in the
>
> norming sample fall largely in the Level 4: Below Basic
>
> area. Many of these students are indeed placed below
>
> grade level in school, when compared to hearing peers
>
> (Traxler 2000:342).

Traxler's comparative study also showed that the majority of the students' scores in the areas of mathematics, spelling, and (English) language likewise fell into the "Below Basic" category. Qi and Mitchell (2012:5) compared the results of the Stanford Achievement Tests, administered between 1974 and 2003, and discovered that the results were "remarkably consistent" in that the "median performance [of students ages 8 to 17] never exceeds the fourth grade level." Gaustad and Kelly (2004) similarly found that college students who were deaf possessed the same level of morphological awareness as hearing students in middle school. Morphological awareness is linked to literacy

acquisition and comprehension. Spencer and Marschark (2010:116) summarized the issues for students who are deaf:

> Acquisition of writing skills by students who are deaf or
>
> hard of hearing continues to be challenging. For students
>
> writing English, word order is more often intact than use of
>
> grammatical words and morphemes such as pronouns,
>
> prepositions, and indicators of tense and number.

Such findings indicate that despite the developments in education and technology over the past several decades, most students who are deaf continue to have difficulty with gaining literacy in English.

The language environment used at home has only a small impact on the overall performance of students who are deaf. Students raised in a fluent-ASL environment are "widely presumed [to become] better readers and writers than deaf children of hearing parents" (Mayer & Akamatsu 2011). Research by Strong and Prinz (1997:43) supports this, as children "perform at a higher level of English literacy if their ASL skills are well developed than if those skills are lacking." However, Mayer and Akamatsu (2011:151) point out "that even [Deaf children of Deaf parents, who use ASL,] may not be reaching levels of English literacy equal to their hearing peers." Therefore, while a fluent-ASL environment better equips the relatively few children who have access to it, these children nevertheless do not acquire English literacy to the same extent as hearing children.

Early technological intervention benefits some children who are deaf; however, most continue to have lower than average vocabulary, syntactic development, and grammar

understanding (Lederberg, Schick & Spencer 2013). Cochlear implants offer greater accessibility to spoken language, but "findings to date have failed to demonstrate that they eliminate children's delays in literacy development" (Spencer & Marschark 2010:91). While the use of cochlear implants does give some students who are deaf advantages over other students who do not have implants, "the children who are using [cochlear implants] still fall below the levels achieved by their hearing peers" (Spencer, Marschark & Spencer 2011:460).

The educational approach similarly has little effect on performance. Mainstreaming, oral-only, and bilingual education still result in students who are deaf acquiring low levels of English literacy. Eighty-seven percent of these students attend at least part of their school day in a classroom with hearing students; this practice is known as mainstreaming (Mitchell & Karchmer 2011). Despite twenty years of being the standard for education, the mainstreaming approach has not improved performance in English literacy activities, as noted above. Most children who are deaf in oral-only programs also experience significant language delays and deficits in comparison to hearing children (Spencer & Marschark 2010:54). Similarly, bilingual education that uses ASL as the language of instruction and written English for print literacy has shown little improvement; "after more than two decades of implementation, there continues to be a lack of empirical evidence to support claims for age-appropriate or even improved literacy levels" (Mayer & Akamatsu 2011:144–145). Correspondingly, Spencer and Marschark (2010:118) note, "Published peer-review data are lacking to indicate that sign/bilingual approaches…support literacy development any better than other educational/language approaches." Consequently, bilingual, oral-only, and

mainstreaming educational approaches have not adequately addressed the deficiencies in education for students who are deaf.

2.2   Bilingual Education with L1 Literacy

As discussed above, the bilingual educational approach that uses ASL as the language of instruction and uses English for print literacy activities lacks evidence to support the idea that it improves the English literacy abilities of students who are deaf. One reason for this could be the mismatch of the theory behind this educational approach and its application.

ASL-English bilingual education is based on Cummins' linguistic interdependence principle (LIP) (Mayer & Akamatsu 2011; Flood 2002). The LIP stipulates that proficiency in a second language (L2) is directly related to the maintenance of proficiency in a primary language (L1). Cummins (1979:233) explained that "for children whose L1 skills are less well developed in certain respects, intensive exposure to L2 in the initial grades is likely to impede the continued development of L1. This will, in turn, exert a limiting effect on the development of L2." This theory counters educational approaches that use only the students' L2 in classroom activities, like the oral-only method in education for students who are deaf. Bilingual education seeks to build proficiency in the students' L1 to create a bridge for literacy skills in an L2.

Much research has been dedicated to testing the LIP in bilingual education for spoken languages. Ample evidence exists that "encoding/decoding skills and functional abilities" of L1 literacy do transfer to L2 literacy (Roberts 1994:211). "The studies investigating the cross-linguistic interactions, although still limited in quantity, generally

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suggest that L1 literacy experience has long-lasting impacts on L2 reading development"
(Koda 2007:29). More specifically, Proctor et al. (2010:17) established that Spanish (L1)
literacy decoding and reading comprehension are "significantly associated" with English
(L2) literacy decoding and reading comprehension. Further research reviews affirm that
"there is a correlation between Ll and L2 reading ability and L2 learners transfer prior
linguistic and cognitive skills from L1 to facilitate their reading in L2" (Karim 2003:53).
(The above research, however, also notes that L2 proficiency is a stronger indicator for
L2 reading comprehension than L1 literacy, which is only a predictor of L2 literacy if L2
proficiency is controlled for.) In addition, Kenner et al. (2004) researched bilingual
children attaining literacy in two different scripts; children learned the English alphabet
and Arabic, Chinese, or Spanish writing systems. They found that the children did not
confuse the writing systems but experienced positive cognitive effects. Therefore, the
research does uphold the LIP for bilingual education with spoken languages.

The LIP theoretically should apply to bilingual education with ASL and English.
Regan (1985:276) argues that "the deaf might be an ideal population for bilingual
education programs" because they fit the characteristics of groups who benefit most from
bilingual education: "(1) children come from lower socioeconomic status, (2) they may
not be proficient in their native language, (3) their native language has low social status,
and (4) teachers in regular classrooms are of a different language background."[1]
However, as stated in Section 2.1, bilingual approaches that use ASL as the language of
instruction with English for print literacy activities have not been shown to improve

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[1] Numbers added by author.

overall acquisition of English literacy. Most bilingual education is structured on two languages with written forms of both languages; however, bilingual education for students who are deaf uses face-to-face ASL and written English. The LIP supposes that students can learn the L2 face-to-face and write in the L1. The majority of students who are deaf currently can do neither, for at least two reasons.

First, spoken English is largely inaccessible to most students who are deaf. Children who do not have sufficient auditory ability are not able to learn spoken English face-to-face. Even the use of cochlear implants, while improving auditory functions for some, does not provide 100% natural hearing and access to spoken English (Lederberg, Schick & Spencer 2013). Therefore, the majority of children who are deaf do not have sufficient access to spoken English to gain fluency.

Second, ASL does not have a widely accepted written form. The LIP holds that students can transfer literacy knowledge from their L1 to their L2. Those who achieve competence in reading and writing the L1 create a bridge to literacy in an L2. However, without a widely accepted written form of ASL, schools hesitate to develop a bilingual program using both written ASL and English. The path to literacy in English must be through literacy in ASL first, because most students cannot learn face-to-face English.

2.3 Reading and Writing ASL

Ways to read and write ASL do exist but none are widely accepted by the U.S. Deaf community. At least a dozen[2] writing systems for sign languages have been developed over the past fifty years. In fact, some elementary education programs in the U.S. have applied different written forms of ASL in bilingual education.

Supalla and Blackburn (2003:50) used a written form of ASL at the Laurent Clerc Elementary School in Tucson, Arizona over a period of six years. This program taught English literacy skills through developing literacy skills first in ASL. They began by introducing print literacy in ASL through ASL-phabet, which is "a series of characters representing the handshapes, locations, and movements of signs in American Sign Language" (Supalla & Blackburn 2003:52). Then they mapped the ASL-phabet written signs to their print English equivalents in classroom activities. To introduce print literacy on the sentence level, they used English Gloss. Teachers instructed students on reading and writing in English Gloss then translating it to English. Grammar was taught by comparing the English Gloss of ASL and written English. After the school closed, Supalla and Blackburn made the materials for the curriculum available for wider use. They also reported that one former student "initiated a due process in the Flowing Wells

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[2] Stokoe Notation System, HamNoSys, SignWriting, si5s, SignFont, ASL-phabet, as well as unpublished systems referred to in the discourse as Scriptus and SignSys, and idiosyncratic systems. Hoiting and Slobin (2002:4) remark on six, including the one they developed, the Berkley Transcription System, some of the above, and SignPhone. Additionally, there are numerous idiosyncratic systems, like SLIPA and ASLSJ.

Unified School District in which the court ruled that she be able to continue using this curriculum as part of her work in public school" (Supalla & Blackburn 2003:55).

SignWriting® was also applied as a written form of ASL in bilingual education. In 1999-2000, Flood focused on the SignWriting learning experiences of four elementary-aged children who were deaf. She observed that these students recruited "other peers and the significant signing adults in their life into their SignWriting experiences" (Flood 2002:251). Since the 1970s, SignWriting has been used as an orthography system for ASL by the National Theater of the Deaf and has been taught and used for research at National Technical Institute for the Deaf (NTID) and Massachusetts Institute of Technology (MIT). It has been published in periodicals and used in education of both children and adults, hearing and deaf (*SignWriting History* 2012).

More recently, Augustus invented si5s in 2003 for literacy in ASL (si5s 2012). Augustus has taught workshops at Gallaudet and other universities, has provided materials to schools for use in education for students who are deaf, and has gained an online following. Some use si5s on a daily basis. However, si5s has not yet become a standard in the Deaf community.

Despite these programs using written forms of ASL and some individuals embracing them, the Deaf community as a whole has not adopted a standardized written form of ASL.

2.4   A Survey of the U.S. Deaf Community

Since the Deaf community in the U.S. has not widely adopted a written form of ASL, this implies that the community does not have a felt need for literacy in ASL. Is that really the case or are other factors involved that prevent the community from adopting a

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written form of ASL? What are the views of those in the U.S. Deaf community regarding

literacy in ASL? This research surveys individuals in the community to better understand

the opinions surrounding literacy in ASL.

CHAPTER 3

METHODOLOGY

This chapter details how the survey was developed and executed. The survey utilized an online format to reach the widest possible audience. The survey appeared in both face-to-face ASL via video and written English. Web Survey Creator, an online survey building website, allowed for embedded videos, and it automatically compiled results. Pilot groups tested and reviewed the survey several times before it was made public. The survey was advertised through the personal network of the researcher and different Deaf organizations. The survey's layout mixed closed- and open-ended questions in a broad to narrow design. Questions were deliberately designed to obtain specific information about (1) demographics, (2) language and education background, (3) general opinions about literacy in ASL, and (4) opinions about specific writing systems. The results of single-selection closed-ended questions were analyzed for statistically significant relationships. The following sections present the survey design.

3.1 Online Survey

An online survey was chosen over the various forms of research surveys available because it best met the research goals. It enabled a wide range of respondents, anonymity, and low costs. Wide distribution of the audience ensured that the results did not reflect only one geographic area in the United States. Qualitative methods of survey,

such as interviews and in-depth questionnaires that consist of mainly opened-end questions, can be costly both in money and time for even a small sample size. These types of survey eliminate anonymity and often are restricted to small area. An online survey, however, allows respondents to stay anonymous and can reach a population over a large geographic area at low cost. Anonymity removes perceived pressure to answer a certain way because of the researcher's presence, which may result in more genuine responses. Surveys sent through the mail also offer a wide geographic range and anonymity, but accrue costs for materials. A paper survey also would be in written English, as no widely accepted form of written ASL exists. A survey only in written English could prevent those in the target population who do not have a strong command of English from taking the survey. A survey only in English is culturally insensitive, as ASL is the primary language of those in the Deaf community.

3.2   Videos of ASL

The survey was designed to be in face-to-face ASL. Question content appeared in ASL and in a written English translation in the survey. The researcher collaborated with a Deaf translator to achieve the most natural ASL questions to obtain the desired information. The survey content was originally written in English. It was translated into ASL for the videos and then was back-translated into English for the written English portions of the survey. The back-translation more closely matched what the translator stated in ASL than the original English. This allowed for both fluent ASL and written English forms of the questions.

Using a Deaf, native-ASL signer, who was training to be a translator, enabled the use of natural ASL. At first, the survey had been translated and signed by non-native signers,

but this resulted in awkward phrasing that did not accurately convey the survey content. Also, those in the target population may not have taken the survey if the survey had not been signed fluently by a native signer. Having someone signing naturally in videos encouraged the maximum number of participants.

3.3 Filming

Digital recordings of the ASL version of the survey content were produced with a High Definition (HD) digital camera. Using HD provided clear visuals of the handshapes and movements, which were necessary for comprehension of the signing. The translator shot the videos in two sessions. Each set of information, instructions, and questions were filmed at least twice. Questions were re-filmed if they insufficiently expressed the survey content or fluent ASL. The HD format, multiple takes, and re-filming resulted in high quality of the content and aided the editing process.

3.4 Editing

The researcher edited the videos in iMovie to form separate clips for each question. The same clip was used in each question for repeated material, like the agree-scalar answers. Finished translations were uploaded as unlisted YouTube videos, which were then embedded into the survey. This meant that only people taking the survey could see the videos. Figure 1 below shows how survey questions appeared to the participants with both the video of ASL and written English. The editing process and video content enabled the participants to engage the survey material in both face-to-face ASL and written English.
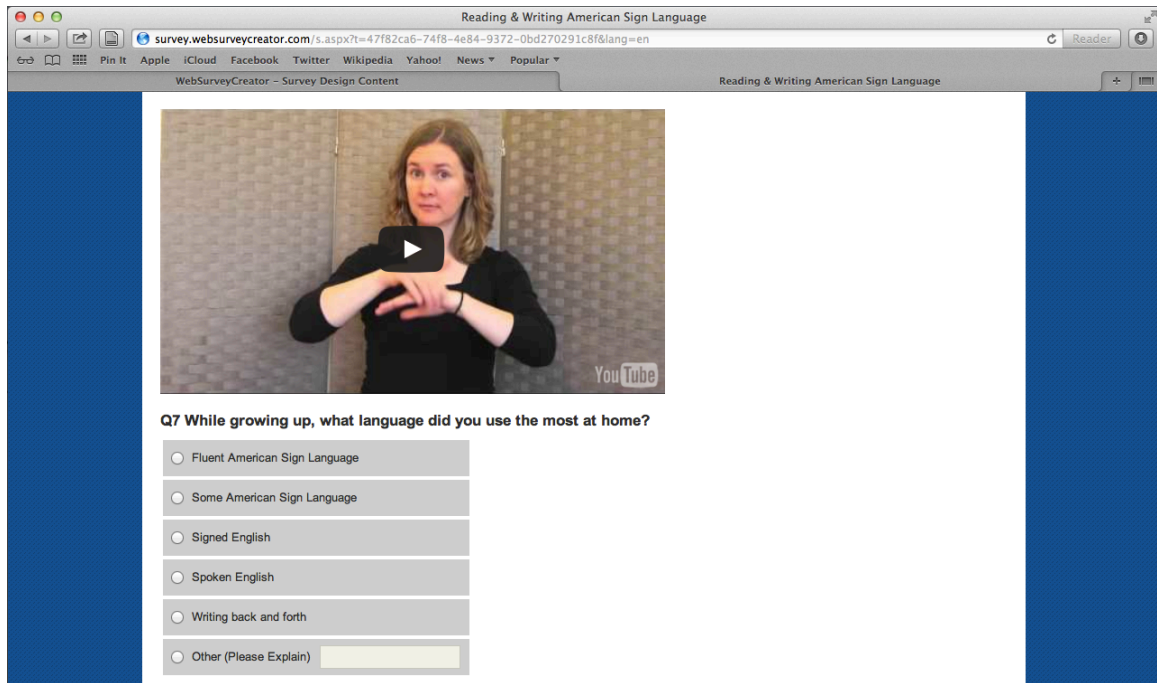
Figure 1. Question Appearance in the Online Survey.

3.5   Web Survey Creator

Web Survey Creator offered the use of ASL recordings in a survey, anonymous responses, and other features helpful to this research. The layout grouped the videos with written English and any visuals, as shown in Figure 1. Participants could start videos when they were ready, and pause, repeat, and stop the videos, all within the survey itself. Web Survey Creator also anonymously and securely compiled the responses for easy organization and analysis.

3.6   Pilot Group

Once a draft of the survey was completed, it was sent out to a pilot group consisting of seven Deaf colleagues or professional interpreters, who offered feedback. The pilot group commented on (1) the clarity of questions in both ASL and English, (2) the time it

took them to complete the survey, (3) the layout and design of the survey, and (4) the cultural sensitivity of the survey content. The researcher considered these comments to improve the survey and to ensure survey participants appropriately interpreted the intended meanings of the survey content. The survey underwent four rounds of pilot testing and revisions before being advertised to the public.

3.7 Advertising

Advertising the survey relied on the researcher's personal network of Deaf colleagues, sign language researchers, and professional interpreters. Advertisements were also sent via email to associations for the Deaf, Deaf alumni associations, Deaf university groups, and other Deaf organizations and websites. Advertisements consisted of a link to the survey, a brief description of the research, and an invitation to take the survey. The invitation appeared in ASL (via YouTube) and in written English.

Because the survey was online, advertising the survey also focused on online communications and social media. The advertisement was published on the Facebook pages of individuals and organizations. The advertisement was also shared via Twitter, Tumblr, and other social media. Websites and forums of different writing systems advertised the survey, as well. This form of advertising allowed for reaching individuals all across the U.S.; however, it may have indirectly excluded individuals in the Deaf community who do not regularly use the internet or social media, which is further discussed in Section 6.2. Nevertheless, the advertising resulted in over 150 people visiting the survey website and 74 people completing the survey.

3.8   Survey Layout

After following the survey link, potential participants came to an introduction page, which briefly explained (1) the researcher's background, (2) the purpose of the research, (3) the anonymity aspect, (4) the survey layout, (5) the estimated completion time, and (6) the intended use of the survey results. The introduction, found in written English in Appendix A, was designed to help potential participants decide whether or not they wanted to take the survey. No questions appeared before all the pertinent information was presented, and participants could return to this page at any time during the survey. The introduction page also thanked participants for sharing their opinions and for taking the time to complete the survey. It provided links to Web Survey Creator's privacy policies and to University of North Dakota research guidelines. Following the introduction, participants clicked "Next" to arrive at the first series of questions (1-15), purpose of which was to elicit general demographics, language use background, and educational background. The survey's second section elicited the respondents' general opinions of literacy in ASL. This section was divided into questions 16-25 and questions 26-39 to limit the number of questions per page, which could facilitate and encourage the participants to answer all the questions. The third section, questions 40-56, presented participants with eight different writing systems, each with examples, and elicited the respondents' opinions about these systems. The final page of the survey reiterated appreciation for the participants' opinions and time and allowed participants to give final comments in question 57. Appendix B gives the survey instructions in written English that was back-translated from the ASL.

3.9   Questions

The survey questions underwent several drafts to ensure that all aspects of reading and writing ASL could be taken into account. Questions were designed using several resources about research design to elicit appropriate responses without being biased or leading. Agree-scalar answers were organized with "Agree Strongly" appearing first to avoid the tendency of survey respondents to choose a negative response if the answers are organized with a negative choice appearing first (Nardi 2003). The questions were intentionally ordered to allow the respondents to express their initial opinions, then to present information that may sway their opinions, and finally to give a follow up opportunity for the respondents to express their views. This approach allowed seeing if new information affected the original opinions; however, Sections 4.4.14 and 5.2 show that the opinions often did not change. The mixture of closed- and open-ended questions gave both specific answers for participants to choose from and allowed the participants to share their thoughts freely. Responses to open-ended questions had to be in written English, not video footage of the respondent in ASL, to ensure anonymity. This gave the opportunity for a secondary evaluation of the respondents' English writing ability, even if it meant participants could not answer in their primary language.

Throughout the following discussion, questions will be referred to as "Q" proceeded by the number of the question. For example, question 1 will appear as "Q1". A list of the questions, their numbers, and their answers can be found in Appendix C.

3.9.1   Question Flow

Built into the survey design are two techniques to optimize gathering the participants' points of view. First, the questions were intentionally organized to move

from general background to opinions about specific writing systems. Examples of specific systems were given at the end to avoid biasing earlier opinion responses and to prevent the respondents from saying they had seen a writing system before when they may have only seen it on an earlier page of the survey. Because the survey did not restrict participants from returning to previous pages and changing their answers, some may have done so.

The second feature was the mix of closed- and open-ended questions. As discussed in Section 1.2.7, closed-ended questions are single- or multiple-selection questions that require participants to choose from predefined answers. Closed-ended questions offer the advantages of being easier to analyze and to zero in on specific issues of interest. Because closed-ended questions have a finite set of choices, the data is quantifiable and statistically analyzable. They also enabled better framing of question context.

However, closed-ended questions present some limitations. Question and answer sets can "force invalid responses, [have] less depth and substance, [and do not allow the respondents] to explain, qualify, or clarify answers" (Seibert 2002:10). The survey employed open-ended questions to avoid some of these limitations. The responses to the open-ended questions had unlimited typing space so participants could write in as much as they wanted. The most important advantage of this type of question was the emic perspective it provided. The responses to the open-ended questions provided context for the answers to the closed-ended questions. This context clarified seemingly contradicting closed-ended response combinations, as demonstrated in Section 5.3.7.1. The open-ended questions also enabled comparing the responses to the closed-ended self-assessment of English questions and the written responses in English.

3.9.2 Background Questions

Background questions were designed to serve three purposes: (1) to identify which of the respondents fell into the target population of Deaf adults from the U.S. Deaf community; (2) to detect possible influences on the opinions of the respondents; and (3) to give context for the answers of specific respondents. Q1-Q3 elicited general demographic information: sex, age range, and hearing status. Q4-Q15 elicited the participants' backgrounds in more detail specific to the study.

3.9.2.1 Onset Age of Deafness

The closed-ended answers in Q4 identified the onset age of deafness, which is important to know because it would affect the educational experience of a participant. One is prelingually deaf if deafened before the age of three, and preliterately deaf if deafened before the age of five. Becoming deaf between 6-12 years old, during the primary education years, conceivably affects learning. Individuals who become deaf in their adolescence, 12-18 years old, may have acquired early literacy concepts but then struggled in advanced literacy development. Deafened later in life, after the age of 18, are those who would not have experienced difficulty in attaining literacy in English due to deafness.

3.9.2.2 Language and Educational Background

Q5-Q11 asked the respondents about their language and educational background. Q5 and Q6 identified the hearing status of the parents or guardians, and Q7 identified the language used at home while growing up. Q8 identified the language currently used at home, and Q10 identified the language used at school. The answer set represented a range of language use: Fluent Sign Language, Some ASL, Signed English, Spoken

English, and Writing Back and Forth. Participants could also type in a response. The results of the language used in the home during childhood (Q7), the language now used at home (Q8), and the language used at school growing up (Q10), could show whether language use changed over time. Q9 identified the respondent's type of schooling from the choices of a residential school for the Deaf, a day school for the Deaf, mainstreamed with an interpreter, or mainstreamed without an interpreter. Because different forms and combinations of these four types exist, Q9 permitted multiple selections and a write-in response of "Other". Comparing the results of Q9 and Q10 could determine what type of education program was provided. For example, if a respondent chose "Mainstreamed with an interpreter" and chose "Signed English", the researcher could infer that the respondent had an interpreter who used a Manually Coded English system in a classroom with a majority of hearing students. Q11 provided information that could show if the respondents' level of education influenced their opinion on literacy in ASL.

3.9.2.3   Involvement in the Deaf Community

Q12 identified which of the respondents were heavily involved in the Deaf community through being a leader, being involved with a school for the Deaf or regularly attending a Deaf association. Participants could type in other ways they were involved.

3.9.2.4   Self-Assessment of English Literacy Ability

Q13, Q14, and Q15 compose a self-evaluation of English literacy ability. Q13 asked the respondents to rate how they felt about learning to read and write English. The respondents evaluated their own abilities to read and comprehend English in Q14 and Q15. These two questions focused on a newspaper for a reference because this reading material would be familiar to those throughout the U.S..

3.9.3   General Opinion Questions about Literacy in ASL

The second section of the survey, Q16 through Q39, started by focusing on the respondents' initial opinions about literacy in ASL and then focused on specific factors that may have influenced their opinions. These questions consisted primarily of agree-scalar questions, as described in Section 1.2.7. Q16 used a scale based on importance: Extremely Important, Very Important, Important, Somewhat Important, and Not Important. Q16 (closed-ended) and Q17 (open-ended) inquired how important the respondents believed literacy in ASL to be and why. Q18 elicited the respondents' personal desire for literacy in ASL using an agree-scalar answer set. Figure 2 below shows how scalar questions appeared to participants.
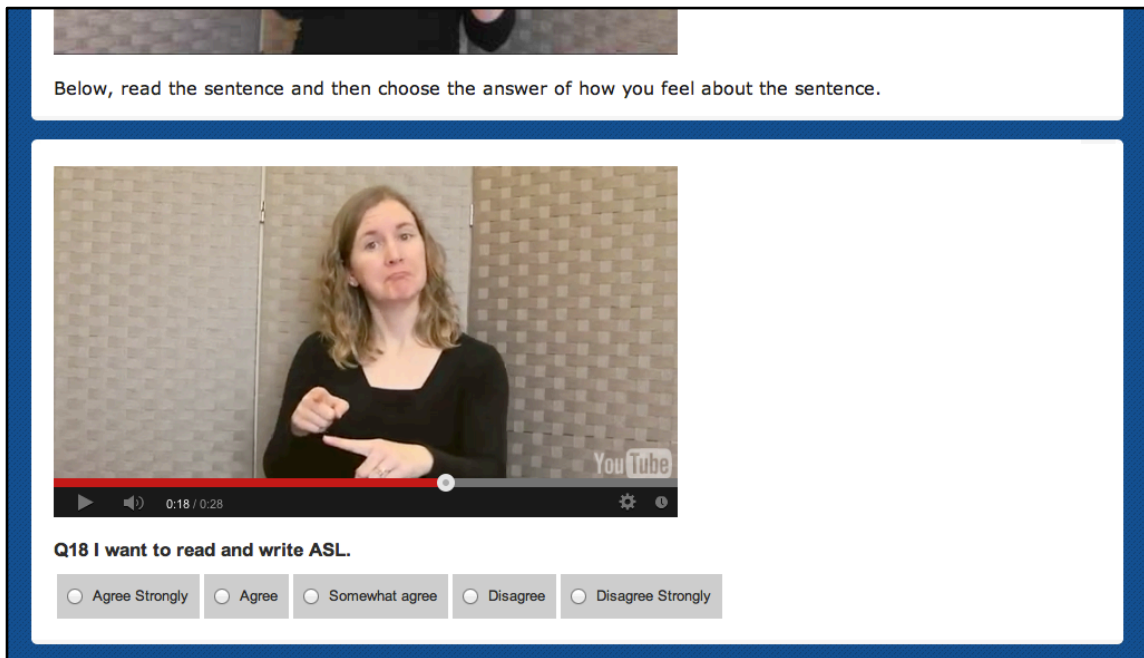
Figure 2. Scalar Question Design

Also using the agree-scalar answer set, Q19 asked if a respondent thought reading and writing ASL would impact their daily lives. Q20 asked whether the respondents believed that learning to read and write ASL is not only important for oneself

individually but for the community as a whole. Q21, Q22, and Q23 asked whether the

respondents agreed with the theory that primary language literacy may aid second

language literacy. Q21 expressed the linguistic interdependence principle (LIP) as it

applies to bilingual education. Q22 addressed children learning to read and write ASL

and English and Q23 addressed adults learning to read and write ASL and English ,

because many people view children and adults as acquiring literacy differently.

Departing from the agree-scalar responses, Q24 gave possible reasons to use a written

form of ASL, which appear in Table 1 below.

Table 1. Suggested Reasons for Using a Written form of ASL Given in Q24

1. Lists
2. Notes
3. Writing for school
4. Writing for work
5. Teach Deaf children
6. Deaf publications
7. Teach hearing people ASL
8. Emails
9. Deaf organizations laws, policies, and notes
10. Text-messaging
11. Poetry and story-telling

Numbers 1 and 2 represent personal jottings for everyday individual use. Numbers 3

and 4 represent some level of language contact because individuals likely will have to use

English in work and in school. This may make the respondents prefer not to read and

write ASL for these purposes. Number 5 represents using a written form of ASL in

education for children within the Deaf Community, whereas number 7 represents

teaching ASL to those outside the community. Numbers 6, 9, and 11 represent the use of

writing ASL in situations within the Deaf community that would normally use ASL if

face-to-face. Numbers 8 and 10 could represent either communicating in ASL or

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communicating with individuals who do not know ASL. These two also focus on the use of writing with technology. Q25 elicited an emic perspective by asking the respondents to write in other activities that would motivate them to use a written form of ASL. This concluded the first series of questions in the second section of the survey.

3.9.4   Questions on Influence

The agree-scalar questions, Q26-Q28, examined if and how the appearance of a writing system affected a respondent's opinion about a written form of ASL. For example, the respondents who strongly agreed that a written form of ASL should look different from pictures and from English (Q28) may desire a system that uses characters that are neither logographic nor based on the English alphabet. Q30 examined whether the hearing status of the inventor mattered to the respondent. The agree-scalar questions in Q31-Q36 tried to identify different motivations for literacy in ASL. Q31 asked if having material for people to read is important for literacy to flourish. Q32, Q33, and Q34 focused on the influence of the participants' personal, local, and national social spheres, respectively. Comparing these three questions could demonstrate which social sphere carried the most weight in the respondents' opinions. For example, if one strongly agreed with Q32 about wanting to learn to read and write ASL if one's friends do, but disagreed with Q33 and Q34, then the personal sphere would be considered more influential than the local or national spheres. Q35 and Q36 examined the influence of leadership in the Deaf community; respected Deaf adults (Q35) or Gallaudet University (Q36) may influence whether individuals in the Deaf community desire a written form of ASL. Q37 and Q38 asked if the respondents would prefer ASL to English for personal communications between Deaf individuals (Q37) and written records in Deaf associations

(Q38). Q39 is a follow-up open-ended question asking participants why they do or do not want to learn a written form of ASL.

3.9.5   Specific Writing Systems

The survey also asked the respondents about eight particular writing systems: (1) English Gloss, (2) HamNoSys, (3) Scriptus, (4) si5s, (5) SignFont, (6) SignSys, (7) SignWriting, and (8) Stokoe Notation System. Some of the writing systems were incorporated because they are commonly mentioned in the literature. Stokoe Notation, SignWriting, HamNoSys, and (most of all) English Gloss appear in sign language linguistics research and literature about writing systems for ASL. si5s also frequently appears in discussions about literacy in ASL.

Each system illustrates a different form for writing ASL. English Gloss represents a writing system that is based on English, looks like English with ASL word order, and can be easily typed. Similarly, Scriptus resembles the English alphabet. SignWriting and si5s represent iconic systems. An iconic system consists of characters that visually resemble the sign as opposed to arbitrary symbols. Stokoe Notation, HamNoSys, and SignSys are not based on English orthography (though they may employ some English letters) and are not iconic systems. They therefore represent new or different systems.

Scriptus and SignSys play another role in the survey. They act as placebos to see if the respondents carefully filled out the final section. These writing systems share an inventor, who has not published nor widely shared the systems. Therefore, it would be virtually impossible for participants to recognize these systems. If they did claim to recognize them, they would likely be mistaken. If they recognized or used all the systems, it would raise suspicion and prompt further investigation of the answers.

Examples of each writing system employed the same five signs: SNAKE, ENTER, DON'T-KNOW, HOUSE, ESTABLISH. A video of these signs was provided so that the participants could compare the written forms to the intended signs. The examples of HamNoSys, SignFont, SignWriting, and Stokoe Notation are adapted from Thiessen (2011). Augustus (personal communication, 2012 October 27) provided the examples of si5s, and Hansen (personal communication, 2012 December 8) wrote the examples for SignSys and Scriptus. The researcher wrote the examples of English Gloss.

Q40 through Q55 appeared in pairs, with Q40 and Q41 being about English Gloss and Q54 and Q55 being about Stokoe Notation. Each pair of questions appeared with a video of the questions and answers in ASL, then the example of the writing system, and finally the written English of the questions. Each even number question of the pairings (Q40-Q54) contained three separate sub-questions. The first asked the respondents whether they recognized the specific writing system. The second asked whether the respondents used the writing system. The third asked whether they knew the hearing status of the inventor to determine if the respondents were aware of the origins of the different systems. The corresponding odd-numbered questions (Q41-Q55) were open-ended questions allowing the respondents to give feedback about each individual writing system.

The writing systems appeared in English alphabetical order of their names; this provided a neutral progression with pseudo-random sequencing of form type, Deaf inventor, and frequency in the literature. Thus, the initial placement of English Gloss relied on it beginning with an "E" and not its popularity in research or in the literature.

Figure 3 displays how each question appeared online to participants.

Figure 3. Appearance of Writing System Example Question

Q56 was an open-ended question that asked respondents if they knew or used other writing systems for ASL, because many systems exist that were not featured in the survey. This question also allowed the respondents to share if they had created their own writing systems for ASL.

The final question, Q57, invited participants to share any other opinions, thoughts, or feelings they had. The responses to Q57, as well as the other open-ended questions, provided invaluable insight into the respondents' opinions.

3.10 How the Results were Statistically Analyzed

This section describes the methodology for analyzing the survey results. Web Survey Creator gathered complete and incomplete surveys and generated summary reports of them in Excel. The summary reports included individual responses, summary statistics, and a collection of all open-ended responses. Using these reports, the results were organized and analyzed.

3.10.1 How Single-Selection Questions were Analyzed: Goodness of Fit Test

To analyze closed-ended, single-selection questions, which composed the majority of questions on the survey, a one-way chi-square test, or Goodness of Fit test, was applied to the results. Equation 1 shows the formula for calculating the chi-square (χ^2) statistic, with f_O representing the observed data and f_E the expected data:

$$\chi^2 \; = \; \Sigma \; \frac{(f_O\text{-}f_E)^2}{f_E}$$
Equation 1

The χ^2 statistic helps determine the probability that the observed results differ significantly from the expected results. The selections of the respondents compose the observed values. For the majority of the single-selection questions, expected values were generated under the premise of a null hypothesis, H_0. If a single-selection question had four options, H_0 supposes that the respondents would select each response 25% of the time. If 100 people answered a four-choice question, H_0 would predict that each response would receive 25 selections. If 100 people answered a five-choice question, H_0 would predict that each response would receive 20 selections. The Goodness of Fit test using H_0 highlights patterns of responses that differ significantly from what the H_0 predicts. The

example below demonstrates how the Goodness of Fit test was applied to closed-ended, single-selection questions. The values are rounded to the nearest one-hundredth.

Table 2. Example of Goodness of Fit Calculations

I want to Read and Write ASL	Observed	Expected	$(f_O-f_E)^2/f_E$	
Agree Strongly	13	12.4	0.03	
Agree	11	12.4	0.16	
Somewhat Agree	24	12.4	10.85	
Disagree	6	12.4	3.30	
Disagree Strongly	8	12.4	1.56	
Total	62	62	**14.34**	Chi-square

The expected values of 12.4 come from taking the total number of responses, n, which was 62, and dividing it by the number of options, in this case five for each option (62/5=12.4). The fourth column shows the products of observed and expected values in the formula with the bottom cell showing the sum, the χ^2 statistic, in bold.

Determining the probability of statistical significance requires a χ^2 critical values chart and finding the degrees of freedom (*df*). The degrees of freedom are calculated by subtracting one from the total number of possible answers. Continuing with the example above, five potential answers yields four degrees of freedom (5-1=4). Consulting the χ^2 critical values for four degrees of freedom, as seen in Table 3 below, reveals the probability of significance.

Table 3. χ^2 Statistic Critical Values[3] for $df = 4$

df	p =.1	p =.05	p =.01	p =.001
4	7.78	9.49	13.28	18.47

For results to be considered statistically significant, the normal probability accepted in the academic community is $p<.05$, which means that there is more than 95% probability that the observed results are different from the expected results predicted by H_0. Therefore, for the single-selection questions of the survey, having $p<.05$ means that the choices were not evenly distributed among the potential answers. In the example in Table 2, the χ^2 value of 14.34 falls between 13.28 and 18.47 in Table 3, which means that the probability that these results are different from the expected results is greater than 99%, as $p<.01$. The Goodness of Fit test only signals that the results are statistically different; why they are different requires looking back at the original data.

In this example, the choice of "Somewhat Agree" received the most selections and "Disagree" and "Disagree Strongly" are also somewhat farther from the expected values. The Goodness of Fit test for this data results in four degrees of freedom, 62 total respondents, a χ^2 value of 14.34 and a probability of less than 0.01, or $\chi^2(4, n = 62) = 14.34$ $p<.01$. Section 4.4.5.2 discusses this finding in more depth.

3.10.2 How Single-Selection Questions were Compared: Test of Independence

The Test of Independence, or two-way χ^2 statistic test, determines whether the responses of two single-selection, closed-ended questions are independent or have a

[3] Critical values based on Witte & Witte 2001:565

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statistically significant relationship., If one question had more responses than the other, then only the answers of the respondents who answered both questions were analyzed, because an equivalent number of answers between the two questions is necessary for this test. For example, if 62 responded to Q_A, but 60 answered Q_B, then only the answers from the same 60 participants would be considered for the test. The example in Table 4 shows the observed values used in comparing Q5 and Q6 regarding hearing status of the respondents' guardians with 62 respondents.

Table 4. Observed Values for Parental Hearing

Observed	Female Deaf	Female Hearing	Total Male
Male Deaf	12	0	12
Male Hearing	2	48	50
Total Female	14	48	62

The observed data consists of the results of one question in the columns and the results of the other in the rows. The final column and row show the respective totals, both equaling 62 total. The middle cells show the subsets of the overlapping responses. For example, zero respondents had a hearing female parent or guardian and a Deaf male parent or guardian. After the observed data are compiled, the expected values can be generated.

To determine the expected values for a two-way χ^2 ($E_{i,j}$), the product of the sum of one column (C_i) and the sum of the corresponding row (R_j) is divided by the total number of responses (n) and entered into the respective cell. Equation 2 below shows this calculation.

$$E_{i,j} = \frac{C_i * R_j}{n}$$
Equation 2

When this formula is applied to the example in Table 4, the results are the following

expected values in Table 5.

Table 5. Expected Values for Parental Hearing

Expected	Fem Deaf	Fem Hearing	Total Male
Male Deaf	2.71	9.29	12
Male Hearing	11.29	38.71	50
Total Female	14	48	62

For example, the expected value for the number of responses for both a Deaf female

parent or guardian and hearing male parent or guardian can be found by multiplying the

total number of Deaf female parent or guardians, 14 (Table 4), and the total number of

hearing male parent or guardians, 50 (Table 4), and dividing the product by 62. The

result of 11.29 is found in the corresponding cell of "Female Deaf" and "Male Hearing"

(Table 5).

A third chart compiled the products of the observed and expected values, the sum

creates the χ^2 statistic. Equation 3, below, was used to derive these values.

$$\frac{(O_i - E_i)^2}{E_i}$$

Equation 3

The values were placed in the cells that correspond to the observed and expected values

used in Equation 3. Using Equation 1, the χ^2 statistic for the entire chart could be

calculated. Returning once again to the example of parental hearing, the observed values

and expected values generate the subsequent Chi-square chart in Table 6.

Table 6. χ^2 Statistic Value for Parental Hearing

Chi-square	Fem Deaf	Fem Hearing	Total
Male Deaf	31.85	9.29	41.14
Male Hearing	7.64	2.23	9.87
Total	39.49	11.52	**51.02**

Equation 3 calculates 31.85 for the observed amount of the respondents whose guardians

are both Deaf (12 from Table 4) and the expected amount of individuals who would have

two Deaf parents (2.71 from Table 5) from H_0. In the same way, Equation 3 calculated

the other values. The χ^2 statistic for this example is 51.02 in bold in Table 6.

A different equation produces the degrees of freedom for the Test of Independence

from the one used for the Goodness of Fit test detailed in Section 3.10.1. The degrees of

freedom calculation, found in Equation 4, depends on the number of categories from both

questions, the first listed as the number of columns (C), and the second, as the number of

rows (R). Equation 4 is the necessary equation.

$df = (C-1)*(R-1)$
Equation 4

For example, the degrees of freedom for comparing a question that had six responses

with another that had five would be twenty $((6-1)*(5-1)=(5*4)=20)$. Continuing with the

comparison of maternal deafness and paternal deafness, the degrees of freedom would be

1, as shown below:

$df = (2-1)*(2-1) = 1*1 = 1$
Equation 5

The null hypothesis of the Test of Independence, or H_0, predicts that the responses of

each question are independent from one another. The alternative hypothesis, or H_A,

predicts the opposite, that the two are interdependent. In the example, H_0 would predict

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that whether a respondent chose "Deaf" for the hearing status of their female parent or

guardian is independent of whether they chose "Deaf" for the hearing status of their male

parent or guardian. Consulting a chart of critical values the H_0 can be rejected in this

example.

Table 7. χ^2 Statistic Critical Values[4] for *df*=1

df	*p* =.1	*p* =.05	*p* =.01	*p* =.001
1	2.71	3.84	6.64	10.83

With one degree of freedom and a χ^2 value of 51.02, or

$\chi^2(1, \text{ n } = 62) = 51.012$, *p*<.001, Q5 and Q6 have nearly a 100% chance of being

related. Looking at the data in Table 6 helps determine what the relationship is. The

cells of the χ^2 chart in Table 6 show which comparisons differ significantly. The farther

a cell's value is from zero, the more likely it is to be significant. Table 6 shows that all of

the χ^2 values are greater than zero. The amount of those whose parents or guardians are

both deaf is most significant because the value 31.85 in Table 6 is 31.85 .

3.11 Conclusion

An online survey that offered questions in face-to-face ASL easily reached Deaf

adults throughout the United States. The survey question types and layout helped to

identify the respondents' backgrounds and opinions. Single-selection and multiple-

selection closed-ended questions were used to collect quantifiable information with

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[4] Critical values based on Witte & Witte 2001.

precise detail. Open-ended questions provided an emic perspective and context for the respondents' closed-ended answers. Questions were sequenced carefully to prevent bias and to move from opinions about literacy in general to specific writing systems. The closed-ended, single-selection questions enabled statistical analysis of the results. The following chapters discuss the findings of the analysis.

CHAPTER 4

RESULTS

This chapter presents the results of the analysis on the data collected by the survey. First, it describes why certain completed surveys were or were not included in the analysis. Then, it gives an overview of the demographics of the respondents before examining the results of each set of questions. The analysis of the closed-end questions demonstrates that the respondents comprise three nearly equal groups. Nearly a third of the respondents strongly favored reading and writing ASL. Nearly a third strongly opposed it. Nearly a third felt ambivalent, holding the opposing views of recognizing the advantages of literacy in ASL but not personally desiring it. Many open-ended responses to Q17, Q39, and Q57 are included in the discussion below to present the respondents' own words and illustrate the feelings of the three opinion groups.

4.1 Filtering for the Target Population

The first step in the analysis was filtering the survey responses for the target population, which consisted of adults who became deaf before the age of five, the age when they would have started to learn to read. The surveys that were completed by hearing individuals were thus not analyzed. Two of the respondents became deaf later in life, after the age of eighteen. To focus the results on those who became deaf before the age of five, these individuals' responses are not included in the analysis.

Another respondent answered "Don't Know" for the onset age of deafness. The respondent also answered that he or she attended a school for the deaf and used writing back and forth to communicate while growing up. These answers suggest that the respondent did become deaf early enough in life to necessitate special schooling. Therefore, this respondent's answers are included in the analysis.

4.2   Demographics

Sixty-two completed[5] surveys remained after filtering the responses for only those in the target population. Twenty-six men and thirty-five women completed the survey; one participant did not indicate gender. The age of the respondents did not differ significantly between the different age ranges.[6] Sixty-one of the respondents became deaf before the age of five. Ninety percent of the respondents were prelingually deafened, and five of the respondents became deaf between the ages of 3 and 5 years old.

4.3   Hearing Status of the Participants' Guardians

Following the general demographic questions came Q5 and Q6 about parental hearing status. For the null hypothesis, the general statistic that 90% of deaf children are born to hearing parents (Schein 1989) was used to analyze Q5 and Q6 instead of the expected value formula described in 3.10.1. Ninety percent of 62 was used to generate

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[5] Not all of the participants answered every question. Some respondents skipped one or two questions, which resulted in different total number of responses for questions.

[6] χ^2 (5, n = 62) = 9.81, $p<.1$. 17 of the 62 respondents were between the ages of 45-55, and 4 were between the ages of 18-25.

the expected value for "Hearing". Ten percent of 62 was used for the expected value of "Deaf" because none of the respondents had chosen "Hard-of-Hearing" or "Prefer not to answer". Nearly a quarter of the respondents had a female parent or guardians who was deaf, $\chi^2(1, n = 62) = 10.90$, $p<.001$. Similarly, 20% of the respondents had a male parent or guardian who was deaf $\chi^2(1, n = 62) = 6.03$, $p<.05$. Comparing both female and male parent or guardians, 100% of the respondents whose male parent or guardian was deaf also had a deaf female parent or guardian, resulting in 19% of the participants having two parents or guardians who were deaf. Only two of the participants had a hearing male parent or guardian and a female parent or guardian who was deaf.[7]

4.4 An Account of Questions 5-39

The Goodness of Fit tests and separate analysis of the questions helped to determine what influenced the respondents' opinions. The analysis identified three influences on the opinions: (1) the potential of literacy in ASL to help improve literacy in English; (2) the possible form of the writing system; and (3) the deafness of the inventor. The results of other questions could not determine influences that affected the majority of the opinions because the respondents' selections were evenly distributed across the agree-scalar answers.

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[7] This matches the statistic that 90% of deaf adults marry hearing individuals (Schein 1989). Slightly surprising is that of these pairs, the father is hearing and the mother deaf, though in the literature often the man is deaf and the woman is hearing (Schein 1989).

4.4.1 *Language Use*

Q7 asked which language the respondent used most at home growing up, Q8 asked which language the respondent now used most at home, and Q10 which language the respondent used most at school.

The participants chose "Spoken English" more than any other choice for the language used at home growing up in Q7, $\chi^2(5,\ n\ =\ 62)\ =\ 27.61\ p<.001$. The other choices were chosen as expected but with "Writing Back and Forth" selected only twice. The higher number of "Spoken English" responses may reflect the fact that 80% of the participants had hearing parents or guardians.

The responses to Q8 showed that over half of the participants now use "Fluent ASL" for their primary language at home, $\chi^2(5,\ n\ =\ 62)\ =\ 71.94\ p<.001$. An additional 11 of the respondents primarily use "Some ASL." Therefore, the majority of the respondents now use sign language at home. Comparing the results of language used growing up and language used now showed that ten of the respondents changed from "Spoken English" to "Fluent ASL".

"Fluent ASL" and "Spoken English" were picked the most from the answers for Q10, $\chi^2(5,\ n\ =\ 62)\ =\ 31.20\ p<.001$. Twenty participants chose "Fluent ASL" as the language used in school, and twenty chose "Spoken English." This even divide between Fluent ASL and Spoken English may reflect the competing education theories for students who are deaf: bilingual approaches that use ASL and English-only approaches.

4.4.2 *Educational Background*

Three questions focused on the participants' education background. Q9 attempted to identify the type of schooling that a respondent experienced. Q10, discussed above,

identified the language of instruction that a respondent experienced. Q11 identified the level of education that a respondent achieved.

4.4.2.1 Type of School

Q9 tried to identify the schooling background; however, two facets of its design limited the results. First, Q9 allowed the respondents to select multiple answers, including "Combination" and "Other" that both included write-in components. The intent was for the respondents to choose one of the school types, "Combination", or "Other", but not all three or both individual types and "Combination". Nevertheless, the respondents often picked more than one school type and "Combination". Some of these respondents wrote in the school types that they selected. Others only indicated "Combination" and wrote in different school types. The varied style of the responses led to muddled results. To avoid these issues, the researcher ought to have made Q9 a single-selection question with "Combination (Please List)" as a possibility or made it a multiple-selection without the "Combination" option. Still, this solution would not have resolved the other design limitation.

Q9 did not ask how long individuals participated in the different school types. For example, as the question was designed, one respondent who spent only a year at a residential school for the Deaf and the rest of their schooling mainstreamed with an interpreter would have answered the same way as another respondent who spent most of their schooling at residential school and only one year mainstreamed with an interpreter, despite the two possibly having very different experiences. Without information about how long the respondents spent in each type of schooling, the responses to Q9 lacked the appropriate context to compare them to the opinions about literacy in ASL. Though

some of the respondents did include time periods with their type of schooling in the write-in sections and others only selected one type of schooling, the overall data set from Q9 was ill-defined. Future revisions of the survey would need a better way to account for the school type with respective language and time period. Nonetheless, the results still offer some insight into the diverse educational backgrounds of the respondents. Figure 4 gives an overview of the schooling types that participants experienced.
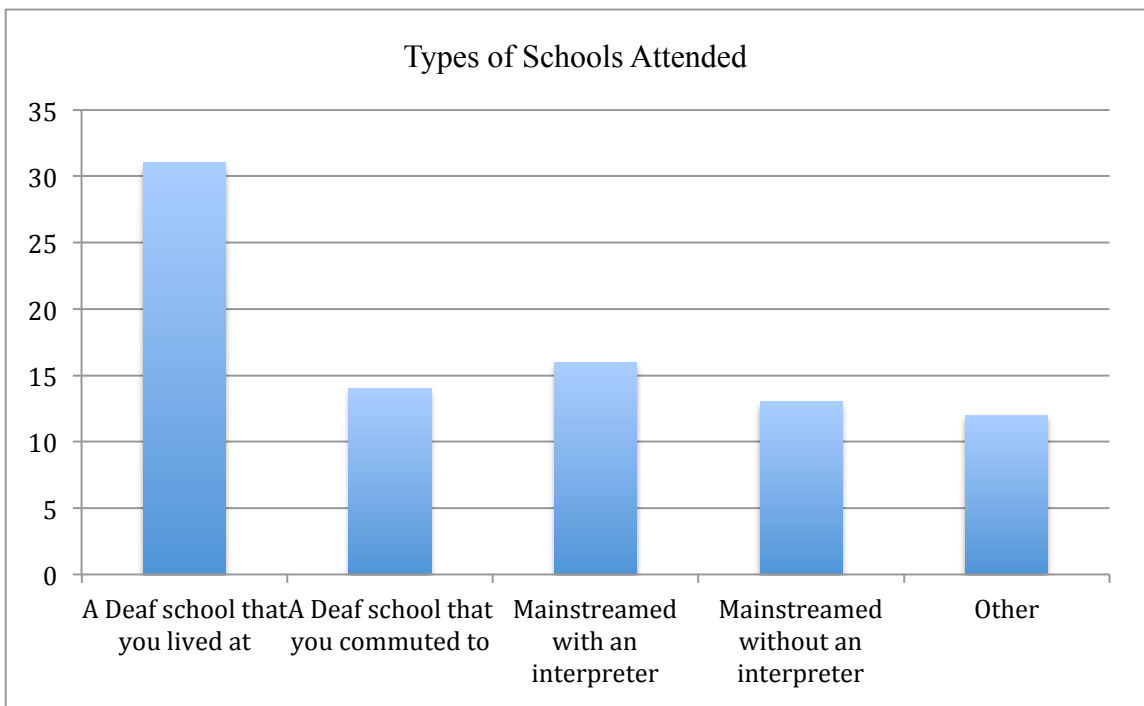
Figure 4. Type of Schools Attended by Participants

As shown in Figure 4, exactly 50% of the respondents, 31, attended a residential Deaf school. Fourteen of the respondents, or 23%, commuted to a Deaf school for part of their schooling. Twenty-six percent were mainstreamed with an interpreter, and 21% at one time were mainstreamed without an interpreter. Nineteen percent of the respondents listed other types of schooling in addition to those offered on the survey. Three of the

respondents were homeschooled for part of their education, and four of the respondents were a part of a special program for students who were deaf at the local public school.

Because of the design of Q9, a conclusive relationship between type of schooling and language of instruction cannot be made beyond the instances where the respondents choose only one type of schooling. Five of the nineteen respondents who only attended a residential school used Spoken English as the language of instruction. This suggests that these respondents attended oralist schools. Of the nine respondents who only attended a school for the deaf that they commuted to, six of these schools used fluent ASL. Not surprisingly, all nine individuals who were only mainstreamed without an interpreter were schooled in only spoken English.

4.4.2.2 Highest Level of Education Acquired

The results of Q11 indicate a high level of education achieved by the respondents, $\chi^2(5, n = 62) = 30.52. p<.001$. Twenty-one of the participants had received a master's degree; two obtained doctorate degrees; and only one did not finish high school. Though 17 of the respondents did not seek further education beyond a GED, the respondents overall are highly educated. This outcome may be a result from the method of advertising the survey.

The majority of the responses to the survey came from the personal network of the researcher sharing the survey through social media. Because the researcher is a graduate student, her personal network draws heavily from colleagues in academia, whose social networks may do so also. Though online advertisements were sent to the websites of each state's association of the Deaf, to the websites of alumni groups of schools for the Deaf, and to other Deaf organization, these advertisements yielded very few responses.

Therefore, a majority of the respondents coming from the personal networks of the researcher's colleagues may have influenced the majority of the respondents being highly educated.

4.4.2.3 Potential Effect of High Level of Education

The analysis suggests that the respondent's education level has no relationship with the following: (1) self-assessment of English literacy ability $(\chi^2(20, \; n \; = \; 62) \; = \; 20.34, \; ns)$, (2) awareness of L1 literacy in education $(\chi^2(20, \; n \; = \; 62) \; = \; 22.54, \; ns)$, and (3) the desire to use of written ASL in Deaf to Deaf communications $(\chi^2(20, \; n \; = \; 62) \; = \; 12.07, \; ns)$. This may result from the high level of education of the respondents. The high level of education shows that the respondents had a strong enough command of English to at least graduate from high school; most understood English well enough to pursue higher education. The survey did not elicit the opinions of those who did not complete high school. Though the survey had been designed with videos in ASL to enable individuals who did not have a strong command of English to participate, the method of advertising online, a predominantly English-based medium, may have limited such individuals from accessing the survey. Had the survey gained more responses from individuals who did not finish high school, education level may have had a greater influence than demonstrated by these survey results.

4.4.3 Community Involvement

Q12 identified the respondent's the level of involvement in in the Deaf community. Those who are leaders in the Deaf community, who are involved with a Deaf school, or who are in regular attendance at a Deaf organization likely carry more influence in the

Deaf community. The chart below shows how many of the respondents chose each answer, with some choosing more than one.
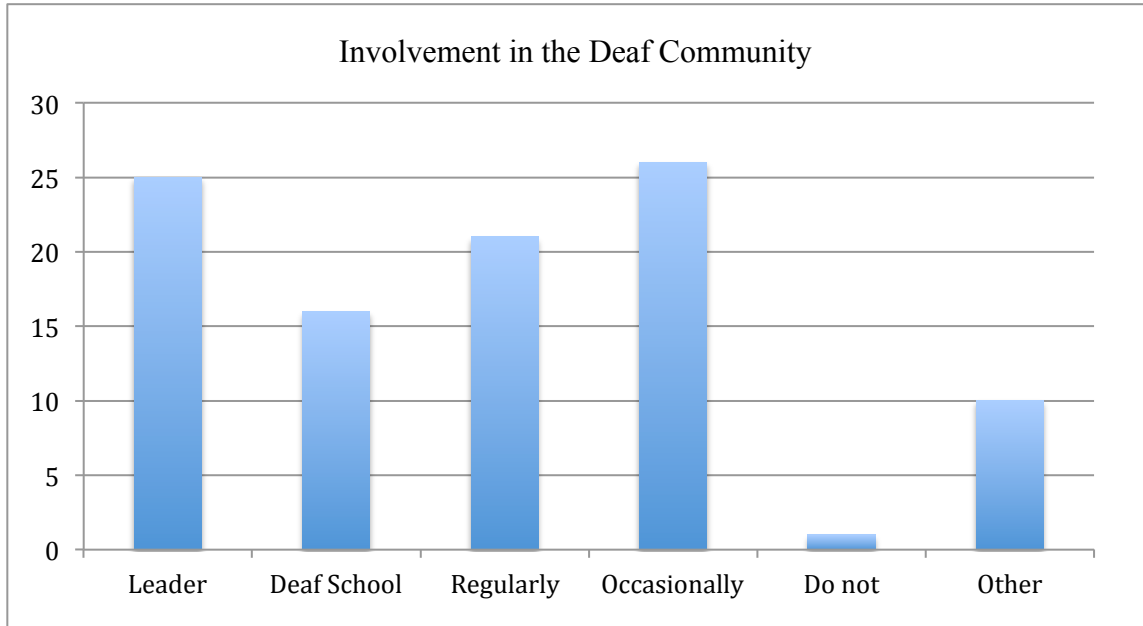
Figure 5. Participant Involvement in the Deaf Community

Twenty-five of the respondents, or 41%, identified themselves as leaders in the Deaf community. Sixteen of the respondents indicated that they were involved with a school for students who are deaf. Two of the participants picked both regularly attending and occasionally attending a Deaf organization, which perhaps reflects different organizations. Only one respondent chose "I do not regularly attend a Deaf organization".[8]

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[8] Respondent 2725X6HEZT also showed strong disapproval for reading, writing, or even signing ASL by stating in her open-ended response, "People should read, write and sign English."

4.4.4   Self-evaluation of Literacy Ability

Q13, Q14, and Q15, identified how the respondents evaluated their reading and writing abilities in English. Q13 showed that nearly 80% of the respondents either agreed or agreed strongly that learning to read and write English was easy, $\chi^2(4,\ n\ =\ 62)\ =\ 36.45,\ p>.001$. The majority of the respondents indicated that they understand all or most of the newspaper in Q14, $\chi^2(4,\ n\ =\ 62)\ =\ 52.20,\ p>.001$. Over 65% of the respondents agreed or strongly agreed that a national newspaper was easy to read in Q15, $\chi^2(4,\ n\ =\ 62)\ =\ 20.6,\ p>.001$. Sections 5.3.4 and 5.3.5 explore whether the participants' self-assessed English literacy abilities influenced their desires to read and write ASL.

4.4.4.1   Possible Explanations for High Self-assessment

As discussed above, the majority of the respondents, regardless of their reported educational level, judged their comprehension to be high. This finding may support Spencer and Marschark's (2010:109) observation that students who are deaf may wrongly assess their English ability. For example, Respondent 98P8VWP693 strongly agreed that learning English was easy (Q13) and strongly agreed that it was easy to read (Q15) and to understand the whole newspaper (Q14). This respondent also wrote, "Because I have mastered English language so I do not need to learn read and written ASL."[9] This comment may show that the respondent has over-estimated their English ability. On the other hand, the overall high level of English comprehension of the

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[9] "Because I have mastered *the* English language, I do not need to learn *to read and write* ASL" would be a grammatically correct statement in English.

respondents may reflect their high levels of education. If more individuals who did not

finish high school had taken the survey, the outcomes may have been different. Still,

people in general tend to inflate their comprehension levels; thus, such self-evaluations

may not accurately indicate how well individuals can actually comprehend.

Nevertheless, how participants view their own English comprehension may influence

their desire for literacy in ASL.

4.4.5   Initial Opinions about Literacy in ASL

Q16 through Q19 asked for the respondents' initial opinions on literacy in ASL. Q16

asked the respondents how important they think literacy in ASL is. Nearly equal

numbers of the respondents selected each choice along the scalar answer set,

χ^2(4, n = 62) = 1.28, ns. The evenly distributed responses to Q16 demonstrate that

there was considerable variety in the opinions held by the respondents about the

importance of literacy in ASL and no consensus around any one opinion.

4.4.5.1   Open-ended comments to Q17

Q17 asked the respondents to explain why they had ranked the importance of ASL as

such in Q16. Some reoccurring themes arise from the varying opinions. Those who

chose that writing ASL was extremely or very important explained that they did so

because of language preservation, codification, elevation of ASL's prestige, and use in

education, among other reasons. Respondent YXEK5QJL5K explained all the benefits

that she and others who answered similarly anticipated in reading and writing ASL:

> Many reasons! 1. It will help Deaf children transfer to
>
> written English easily. It will also help develop their
>
> writing and reading skill. 2. It will help us fine-tine [fine-

tune] our ASL skill. 3. It will be useful for ASL teachers to

properly assess the students' expressive and receptive skill.

ASL Gloss is variable across students and teachers, so ASL

writing would help standardize tests. It will put ASL

students correctly document ASL as they learn and use it

for studying purpose. 4. We need a way to document ASL

to preserve the language and reading/writing ASL takes

away the work of videotaping ourselves. 5. Reading and

writing ASL will allow us to enjoy and visualize stories

better without looking at a person signing the story in the

video. 6. Last, it will allow us to express ourselves without

English interference and take away the work of translating

and finding equivalent words for certain ASL words and

phrases.

Many saw literacy in ASL not just as a tool for learning English better, but also as

something that the Deaf community can embrace for ASL in and of itself.

Conversely, some did not view literacy in ASL as important. Many of those who

chose "Somewhat Important" or "Not Important" for Q16 did so because of the necessity

to know English. Respondent S589ZGXKS9 expressed this by writing in:

C'mon, we live in hearing world. In my opinion, being able

to read, write, and understand English is one of the skills

we can learn to function in the real sometime hard world,

being independent, not needing to depend on interpreters

too much, communicating well with hearings without being

frustrated with each other, not misunderstanding things

easily, etc. BUT if you are texting or writing TO a deaf

person, go ahead and write asl style.

Some of the responses reflected an English-only opinion. For others, their proficiency in

English nullified their individual need for literacy in ASL. Another recurrent opinion

against literacy in ASL was that ASL is "not a written language" (9NU6Z932JA,

SE2V6WQ6V4, JBP4E8P286). Respondent YXNX32V895 summarized this opinion:

ASL is never considered as written language and is not just

a natural part of our Deaf culture. In fact we reject the

pressure of being forced to make it to become a written

language to fit the hearing world.

The necessity of knowing English as the majority language and the uniqueness of ASL as

an unwritten language emerge as strong motivations against literacy in ASL.

Recognition of these negative aspects but also the positive aspects of literacy left

some feeling ambivalent. Some individuals felt torn between literacy in English and

literacy in ASL. Respondent FWL2246277, who chose "Somewhat Important,"

explained this ambivalence:

English is the dominant language (in the United States) and

to integrate Deaf and hearing cultures unfortunately will

require Deaf persons to have varying literacy in English.

That said, having a written form of native ASL helps

institutionalize the language for the Deaf community and

also generates authenticity and authority of ASL as a

language with historicity and allows others to access

(within postmodern constraints of interpretation) ASL-

transcribed "Deaf memories" left by written ASL.

The preference for video technology to record ASL undermined some of the respondents' desires to write ASL. Respondent M9T828DTPN, who is between 25-34 years old, clarified her opinion that writing ASL is somewhat important: "We already have video to preserve ASL dialogue, stories and the like."

The respondents who think literacy in ASL is somewhat important and only "Somewhat Agree" that they would like to read and write ASL (Q18) are not against the idea of literacy in ASL; rather, they are not highly motivated to acquire it. Some of the respondents connected their desires to read and write ASL to what the majority would decide. If it were widely accepted, then they would follow suit. However, with the proponents of literacy in ASL in the minority, there does not seem to be much incentive at present for those in the middle to change.

4.4.5.2 Personal Desire for Literacy in ASL

The results of Q18 further illustrate the conflicting opinions identified in Q16. A third of the respondents chose "Somewhat Agree" to whether they wanted to read and write ASL, $\chi^2(14.34, \text{ n } = 62) = 1.41$, $p<.01$. However, the rest of the responses were evenly distributed among the other selections. This means that a third of the respondents desire literacy in ASL and a third do not. Thus, both Q16 and Q18 show that equal numbers of the participants are strongly for literacy ASL, strongly against it, and ambivalent. This is further discussed in Section 5.3.7.

4.4.5.3   Opinions on the Improvement of Daily Life from Literacy in ASL

Q19 shows that the opinions are evenly distributed across the agree-scalar answer set about whether the respondents agreed that literacy in ASL would improve their daily lives, $\chi^2(4, n = 62) = 1.41$, ns.

4.4.6   Others Use of Literacy in ASL

For Q20, the vast majority of the respondents agreed that others should learn to read and write ASL if desired, regardless of the respondents' personal desires, $\chi^2(3, n = 62) = 38.52$, $p<.001$. This suggests that the respondents strongly believe the Deaf community, as a whole, should have a written form of ASL available to use. The intent of Q20 was to ask whether participants thought literacy in ASL was worthwhile for the community, regardless of personal preference. However, some of the respondents may have understood the question differently and agreed, thinking that individuals should choose for themselves.

A Test of Independence was used to compare the results of Q20 and the results of Q21, which asked whether the respondents thought L1 literacy would help improve L2 literacy. If the respondents did believe literacy in ASL would be beneficial to others in the community, even if not for themselves personally, it may be because they also recognize the benefits of literacy in one's primary language. There is a clear connection between the respondents' opinions about others learning a written form of ASL (Q20) and the role of primary language literacy (Q21), $\chi^2(12, n = 61) = 71.25$, $p<.001$. Every participant who strongly agreed that other Deaf individuals should have an opportunity to read and write ASL also strongly agreed or agreed that primary language literacy does help developing second language literacy. Similarly, most individuals who

chose "Disagree" for Q20 also chose "Disagree" or "Doesn't Matter" for Q21. This suggests that many of the respondents did interpret Q20 as intended by the researcher.

4.4.7 Value of Primary Language Literacy

The respondents generally agreed that acquiring literacy in one's primary language improves the ability to acquire literacy in a second language. Most of the respondents agreed to Q21 that primary language literacy helps one to attain literacy in a second language, $\chi^2(4, \text{ n } = 61) = 26.34$, $p<.001$. Only three of the respondents disagreed and one strongly disagreed. The majority also felt that literacy in ASL would help children to acquire literacy in English, $\chi^2(4, \text{ n } = 62) = 10.34$ $p<.05$ (Q22) and that literacy in ASL would help adults to acquire literacy in English, $\chi^2(4, \text{ n } = 62) = 11.44$ $p<.05$ (Q23). Though these results suggest that most of the respondents recognized the potential benefit of literacy in ASL, interestingly, many did not express a personal desire to read and write ASL in Q18. Some of the respondents who agreed to Q21-Q23 may consider literacy in ASL to be beneficial to others but not for themselves specifically.

4.4.8 Use of Literacy in ASL

Q24 identified the specific motivations that individuals might have for writing ASL and the general spheres they would use it in. Because not every participant answered each choice, Table 8 below gives the total number of responses for each use.

Table 8. Revised Totals for Q24

	Yes	No	Total
Lists	32	26	58
Notes	38	21	59
Writing for School	24	35	59
Writing for Work	29	30	59
Teach Deaf children	37	21	58
Deaf Publications	35	25	60
Teach hearing people ASL	41	17	58
Emails	29	30	59
Deaf organization's laws, policies, and notes	29	30	59
Text messaging	31	28	59
Poetry or story-telling	40	19	59

The graphs of whether or not participants would use a written form of ASL in the specified circumstances show the near-even split of the desires. The bar graphs shown in Figure 6 are grouped by the sphere of use, as described in Section 3.9.3.
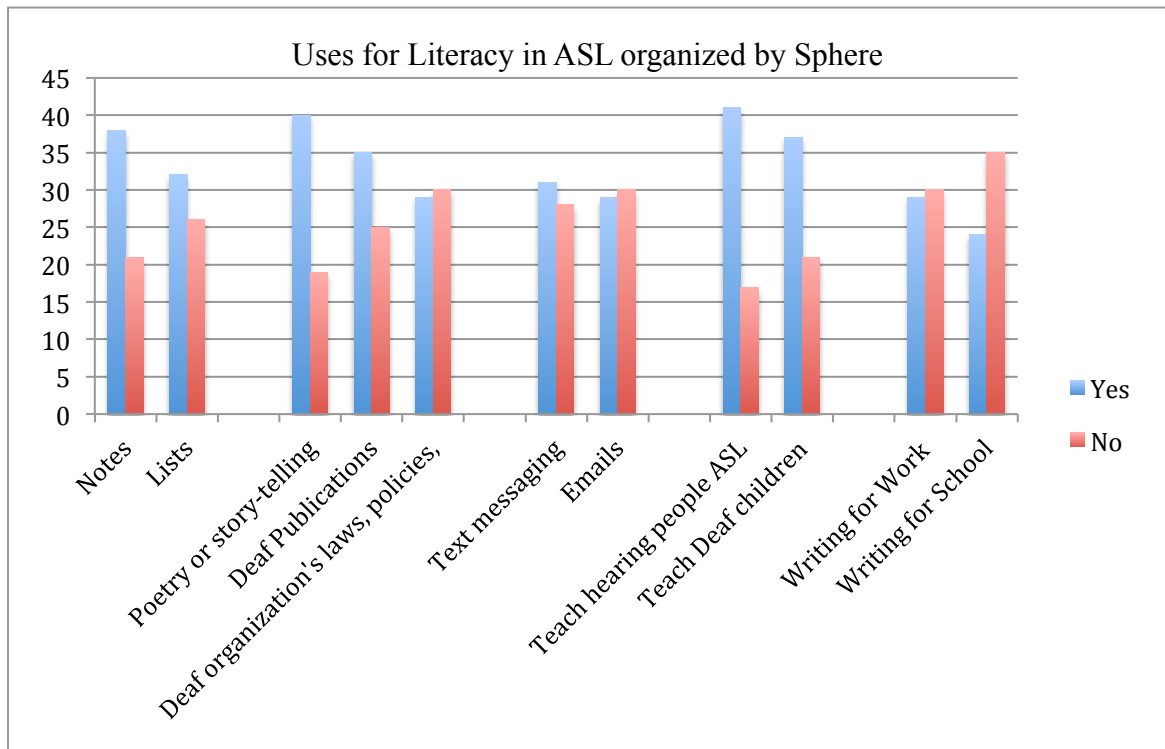
Figure 6. Uses for Literacy in ASL Organized by Domain

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Figure 6 suggests that the respondents are inclined to use a written form of ASL in the sphere of education: teaching hearing people and children. Similarly, personal use of notes and lists seems to be a motivation for literacy in ASL. However, submitting the results to Goodness of Fit tests[10] showed that only "teach hearing people ASL" was significant, $\chi^2(1, n = 58) = 4.97$, $p<.05$, whereas the others were not. "Poetry or story-telling" came near to $p=.05$ with $\chi^2(1, n = 59) = 3.74$, $p>.05$.

These findings may be once again due to the majority of the respondents having a strong command of English. Because many of the respondents have acquired a high level of English literacy, English can meet their print literacy needs of personal writings and written communications. This may weaken the desire for literacy in ASL. However, individuals who struggle with English may have a stronger desire to write ASL because English cannot fulfill their needs.

4.4.9 Influence of Writing System Design

Q26 through Q29 evaluated the influence that the writing system design may have on its acceptance by the community. There was no significant agreement or disagreement that a written form of ASL should use an orthography that looks like pictures (Q26) $\chi^2(4, n = 59) = 6.70$, ns, or should use English orthography (Q27)

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[10] The responses to Q24 had to be modified to use a Goodness of Fit test for these results. Each item on the list was handled separately. Two participants only chose yes, leaving others blank. The researcher concluded by consulting these respondents' open-ended answers that the blanks were meant to be "no" and marked them as such. In other cases, some of the respondents selected "yes" to some, "no" to others, and left others blank. Their blank ones thus were not counted in the totals. Observed values came from the number of respondents who chose yes or no, as in Table 8. Expected values were based on the total number divided by the two options.

χ^2(4, n = 59) = 5.07, ns. However nearly half the respondents agreed in Q28 that

ASL should have a written form that looks different from pictures and from English,

χ^2(4, n = 59) = 24.95, *p*<.001. Q29 asked the respondents what they thought the

writing system should look like, and their responses reflected the answers to Q26-Q28.

Some of the respondents did suggest it look like pictures. Others, conversely, desired it

to look like English. Still other respondents did not have a preference for its design, as

long as it was "easy to use" (H656E5K4QH). The specific agree-scalar questions about

the written form design may be inconclusive since they were asked before they were

shown samples of specific writing systems. For that reason, their opinions about the

writing systems, as discussed in Chapter 5, give better insight.

4.4.10 The Influence of the Inventor's Deafness

Anecdotally, people have suggested that a written form of ASL has not been

accepted because the inventors of different systems were hearing, not Deaf. The results

of Q29 support this. The majority of the respondents agreed that an inventor of a writing

system must be Deaf in Q29, χ^2(4, n = 59) = 15.86, *p*<.01. Interestingly, seven

individuals disagreed or strongly disagreed with this and almost a third of the respondents

indicated that it didn't affect their opinion.

4.4.11 Influence of Material

Over half of the respondents chose "Agree" or "Agree Strongly" for whether they

would read materials in ASL if they existed, χ^2(4, n = 59) = 12.07 *p*<.05. This

suggests that if more people in the community used a written form to create publications,

others would want to learn to read these publications, as discussed further in Section 6.1.

4.4.12 Weight of Social Influences

Q32-Q34 asked about different spheres of social influence—personal (Q32), local (Q33), or national (Q34)—to see which, if any, had more influence than the others. The respondents generally agreed that they would learn to read and write ASL if their friends read and wrote ASL (Q32), $\chi^2(4, \text{ n } = 60) = 15.83$, $p<.01$; if those in their local community did (Q34), $\chi^2(4, \text{ n } = 61) = 13.54$, $p<.01$; and if the national community did (Q35), $\chi^2(4, \text{ n } = 60) = 15.75$, $p<.01$. This suggests that the respondents would be willing to learn if others used a written form of ASL, regardless of the social sphere. The vast majority of individual respondents chose the same answer across Q32-Q34, with only one individual who chose "Disagree Strongly" for Q32 and Q33 but "Agree" for Q34 (FYBDWFPD8E). Therefore, not one social sphere held more influence than any others.

Q35 asked whether respondents would learn to read and write ASL if people they respected read and wrote ASL. The respondents mostly agreed that they would, $\chi^2(4, \text{ n } = 61) = 15.77$, $p<.01$. This implies that respected individuals hold the same influence as others throughout the different social spheres.

Gallaudet University is often considered a cultural hub for the Deaf Community. In Q36, the respondents generally agree that if Gallaudet supported a written form, they would want to learn it, $\chi^2(4, \text{ n } = 61) = 13.75$, $p<.01$.

In each of the above questions, the respondents indicated agreement towards adopting literacy in ASL if others did. No one social influence held more weight than others; what seemed to matter was the general opinion of the community.

4.4.13 Influence of Deaf to Deaf Communications

Since face-to-face communication between Deaf individuals normally takes place in ASL, one might expect that Deaf people would prefer to write ASL rather than English when writing to another Deaf individual. Q37, about the use of writing in Deaf associations, and Q38, about written communication between Deaf individuals, were intended to test this expectation. However, there was no significant agreement or disagreement, Q37 $\chi^2(4, \text{ n } = 61) = 4.23$, ns and Q38 $\chi^2(4, \text{ n } = 61) = 8.95$, ns. Surprisingly, more individuals disagreed than agreed to wanting to use a written form of ASL for writing in a Deaf association, though not a statistically significant amount.

4.4.14 Open-ended Responses to Personal Desire

Having made initial comments in Q17 as to why they did or did not think a written form of ASL was important, the respondents were asked to reflect again in Q39 why they personally did or did not want to read and write ASL. As seen previously (in Section 4.4.5), roughly equal numbers of the respondents were for literacy in ASL, were against it, or were ambivalent. The respondents justified their feelings in the same ways in Q39 as in Q17. Those who opposed it reiterated both the need to know English as the majority language and the feeling that there is no need to write ASL. Respondent 5DRG7536K2 summarized these opinions:

> I would prefer to leave ASL as an conceptual language, in
>
> sign language only. IT would show the respect of deaf
>
> community's norms and language -- we need to upgrade our
>
> deaf education system and get our deaf members more
>
> fluent in the written ENGLISH mode more than ASL so

they can have the opportunity for advancement and so

forth.

This participant also disagreed in Q21-23 that acquiring literacy in a primary language or ASL would help acquiring literacy in a second language or English. Respondent YXNX32V895, explained why he or she[11] opposed literacy in ASL:

No [I do not want to read and write ASL]. I happen to be a national leader and I know many deaf people will reject this idea of developing a written language for ASL. It is against our "DeafHood" and I know that it will never succeed. Maybe fine for the world of linguistics. I do NOT have any problem if anyone is curious and want to lean [learn] more about written ASL. Just do not push or force this idea on us when we do not want or not interesting on that.

This respondent demonstrated his or her profound disapproval of literacy in ASL by selecting "Disagree Strongly" to every one of the agree-scalar questions, except for Q20 about whether others should have the opportunity to read and write ASL if they desire. For Q20, the respondent chose "Disagree" which reflects the comment above as it was the only question he or she did not select "Disagree Strongly".

On the opposite side, proponents for reading and writing ASL desired to write their primary language. Some of those who strongly support literacy in ASL have already learned a written form of ASL. Respondent YXEK5QJL5K expressed this:

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[11] This is the one respondent who did not indicate gender.

I'm already learning to read and write ASL, and I already

see the value of it! It allows me to fine-tune my ASL and

express myself fully in ASL rather than trying to translate

from ASL to English as they are completely different

languages. I also think that people will respect ASL more if

there is a written system. ASL learners would be able to

retain information better as they have a way of

documenting the signs they see from the teacher. I taught

ASL, and I know I would benefit from it greatly.

Another supporter of reading and writing ASL wrote, "Asl is easy than writing in

English" although she highly rated her English ability and agreed that learning English

was easy (Z45RM98G82). However, not all of the respondents felt personally motivated

by the benefits of literacy in ASL.

Many of those who were ambivalent felt that their own command of English

diminished their personal desire for writing ASL but saw a benefit in using it with other

Deaf individuals who do not know English as well as themselves. Respondent

FWL2246277 stated, "This is highly contextual - as a Deaf person myself, I respect the

background of every person with hearing loss. I prefer English but work with many Deaf

persons who have far less fluency or literacy in English." Others who felt ambivalent

prefer to wait until more in the Deaf community adopt it before they do so. Respondent

M9T828DTPN articulated this sentiment, "It's intriguing, but until it's widespread, I'm

not really going to bother."

The respondents expressed the same opinions in Q39 as Q17, with many using the second question to elaborate their opinions described in the first question. Those opposed to literacy in ASL feel that written English and video technology meet their literacy needs and that ASL should remain unwritten. Those who support literacy in ASL feel that it has educational benefits and allows them to express themselves in ASL without depending on writing English. The ambivalent respondents are waiting for a critical mass of people in the Deaf community to adopt a written form of ASL before they will do so themselves.

4.5   Summary

The general demographics show how the respondents fit into the target population and give a foundational context to the respondents' answers. They also show that a larger than expected amount of the respondents had Deaf parents or guardians. The analysis of the single-selection multiple-choice questions reveal that the majority of the respondents agreed that (1) others in the community should use a written form if they desire, (2) acquiring literacy in one's primary language is beneficial to acquiring literacy in an L2, (3) the inventor of a written form should be Deaf, (4) a written form of ASL should not look like English or pictures, and (5) they would learn a written form of ASL if most in the community did. A majority of agreement or disagreement was not found for the use of a written form of ASL for Deaf to Deaf communications (Q37 and Q38) and for questions about personal desire for literacy in ASL (Q16, Q18 and Q19), rather an even distribution of opinion was shown.

CHAPTER 5

RESULTS CONTINUED

This chapter continues the discussion of the survey results. It focuses on the opinions of the writing systems in Section 5.1, the closing remarks of the respondents in Section 5.2, and factors on the respondents' personal desires for literacy in ASL in Section 5.3.

5.1   Evaluation of the Writing Systems

The third section of the survey, Q40-Q56, showed specific writing systems to the participants. The survey asked if the respondents recognized or used the writing systems and if they knew whether the inventors were deaf. English Gloss had the most recognition and use of the eight systems featured in the survey. The rest of the writing systems, with two exceptions, were mostly unknown and were not used by the respondents.

5.1.1   English Gloss

As mentioned above, the majority of the respondents, 45 individuals, reported recognizing English Gloss, and 35 said they used it. The Goodness of Fit test showed no statistical difference in the selection of whether the inventor was Deaf or not, $\chi^2(2, \text{ n } = 58) = 3.89$, ns. Half of the respondents answered, "I don't know," and the other responses were evenly split between "Yes" and "No."

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Thirty-nine of the respondents typed in responses as to why they did or did not like English Gloss. Eighteen expressed they did not like it because English Gloss depended on English despite ASL and English being distinct languages. This led these respondents to comment that English Gloss is: "Vague" (2725X6HEZT), "Not Natural" (HZ237J8M9M), and "Doesn't make sense" (CT452W462Y). One respondent (DE4YZNE632) summarized this opinion:

> No, because it pulls my mind out of ASL and makes me
> think in English. Also, it can't easily be used to show
> variations (a different sign for "House" might exist!) or
> variations in how the sign is used ("the house over there,
> and the house up the hill from it over here...")

On the other hand, some found English Gloss to be a suitable written form of ASL. Respondent FYBDWFPD8E described English Gloss as "a fair representation." Respondent V9X4Z3EEX5 recognized its limitations but expressed that he likes it for research and publications, as it is "user friendly for general audiences." This answer shows the positive opinion of English Gloss as a bridge between ASL and English communication. Only a few of the respondents, however, expressed that they preferred English Gloss.

The overall comments suggest that English Gloss was not preferred, but other questions suggest otherwise. In Q28, when participants were asked what a written form of ASL should look like, many suggested glossing or "Simple English" (Z944P6K8U3). For Q56, which asked participants if they knew of other writing systems for ASL, Respondent 98P8VWP693 replied, "I would write English using ASL grammar," which

is very similar to what English Gloss is. These comments show that some of the respondents desire a written form that uses English words like English Gloss. This way of writing ASL may be prevalent and desired because ASL users are already familiar with written English and use it to communicate with English users.

5.1.2 *HamNoSys*

Though 12 respondents (20%) did recognize HamNoSys, over 75% did not, $\chi^2(2,\ n\ =\ 58)\ =\ 50,\ p<.001.$[12] Only two of the 58 respondents said that they used HamNoSys. The responses to whether the inventor was deaf were nearly split between "No" and "I don't know," which became a common theme for when the respondents were unfamiliar with the writing systems. The open-ended comments showed overall criticism of HamNoSys. Only one of the 38 people who commented on HamNoSys said something positive: C4AVY88P7Q noted, "If a child learns how to use these, it may help them understand better before starting to write in English." However, the rest rejected it as too complicated, abstract, linear, confusing, nonsensical, and unintuitive. FWL2246277 felt HamNoSys "looks like a code." Three of the respondents commented on its place in linguistics research but felt it should not be used as an orthography.

5.1.3 *Scriptus*

As one of the placebo examples to test the reliability of the answers, Scriptus, an unpublished writing system, ought to have had extremely few or no individuals who recognized or used it. As expected, no one said they used Scriptus. Two people thought

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[12] The remaining number of the respondents chose "I don't know".

that they recognized it. Consulting the other answers of these two respondents, it seems

reasonably clear that they do not know the script or its inventor. One thought it was from

a textbook, but Scriptus is not published. The other was unsure if the inventor was Deaf,

which shows that the respondent did not know the inventor personally since the inventor

is hearing. Because Scriptus is not published and the inventor has shared the system with

only a few people in her personal network, this respondent apparently did not know the

inventor and did not actually recognize Scriptus. Therefore, these two respondents were

mistaken. The majority of the individuals did not know whether the inventor was deaf or

not. However, as with HamNoSys, a third of the participants assumed that the inventor

was hearing despite not being familiar with the system. Only three thought the inventor

was Deaf.

Five out of the 32 respondents who commented on Scriptus wrote that they preferred

it to HamNoSys, but they felt it was still overly complicated and confusing. This

indicates that the respondents compared it to HamNoSys rather than evaluating it on its

own merits.

The respondents expressed in their comments about Scriptus that they did not like it

because they could not immediately interpret it. Some, however, recognized that they

could learn the system. Respondent FWL2246277 commented:

> This actually seems easier to pick up than HamNoSys,
>
> analogous to Sanskrit or Thai. It'd require some guidance,
>
> but somehow seems more intuitive and natural.

This feedback again demonstrates the tendency of the participants to evaluate Scriptus by

comparison to HamNoSys.

As the respondents continued to evaluate the different systems, they repeatedly used

how quickly and easily they could interpret what the characters represented as a measure

of how much they liked it.

5.1.4   si5s

The third featured system, si5s, is one of the two exceptions to the respondents not

recognizing the writing systems. Twenty-two of the 56 respondents recognized si5s, and

eight currently use it. Furthermore, a larger amount of the respondents knew that the

inventor was Deaf. Though statistically insignificant, $\chi^2(2,\ n\ =\ 57)\ =\ 0.21$, ns, this

result deviates from the pattern of the respondents assuming an inventor of an unfamiliar

system to be hearing.

The greater familiarity with si5s may be a result of the snowball effect of the way the

survey was advertised: The researcher shared the survey with the inventor of si5s, who

shared the survey advertisement with his network. Additionally, the author of a blog that

teaches and advocates si5s posted the survey advertisement.

Though si5s experienced greater recognition and use, not all of the open-ended

comments were positive. Eight respondents, who were unfamiliar with si5s, wrote that

they thought it was too confusing and unintuitive.

Others strongly supported si5s. One supporter explained, "I like it because the digits

resemble the handshapes and the intelligent use of space makes one word appear on paper

together instead of sequentially" (KR83XPK7LM). The positive comments from those

who did not recognize si5s related to how easily they could understand how the written

form represented the sign. This shows that iconicity again determined whether the

respondents liked the writing system; iconic systems were liked better than arbitrary ones.

5.1.5 SignFont

The trends of assuming a hearing inventor for an unfamiliar system and disliking the system because of its lack of iconicity persisted with SignFont. SignFont was not widely known by the respondents. Four thought they recognized it, one of whom confirmed this by commenting on ASL-phabet, a system derived from SignFont. Again, nearly half of the respondents assumed that the inventor was hearing (although many Deaf and hearing individuals collaborated to create SignFont (SignFont 1987)). Moreover, the majority of the respondents who wrote in a comment rejected it as not making sense and not being understandable. Four, however, appreciated how SignFont could be used for typing on a keyboard.

5.1.6 SignSys

Over 90% of the respondents did not recognize or use SignSys, which was predictable because it is unpublished. Like Scriptus, two individuals thought they recognized SignSys. Curiously, these are different respondents, though the inventor is the same for both systems. The inventor also has not published or widely shared SignSys, so these respondents are likely mistaken.

Nearly half of the respondents again reasoned that the inventor of this writing system (which was unfamiliar to them) was hearing.

Some participants preferred this system's use of characters from English orthography, while others disliked it. Some of the respondents remarked that the form

could be easily used on a computer or "text-reliant platforms" (V9X4Z3EEX5).

However, Respondent KR83XPK7LM wrote, "It borrows English and is completely

divorced from signing ASL." The resemblance to written English made two individuals

think SignSys would depend on being able to hear sounds. As with the above systems,

the negative comments revolved around the respondents' inability to immediately

interpret the signs that the forms represented.

5.1.7 *SignWriting*

SignWriting is the second exception to being an unfamiliar writing system, with si5s

being the first. Forty percent of the respondents recognized SignWriting. Just like si5s,

eight claimed to use SignWriting.[13] The majority of the respondents either did not know

if the inventor was deaf or assumed the inventor was hearing (The creator, Valerie

Sutton, is hearing although many Deaf individuals have collaborated with her to develop

the current version of SignWriting (*SignWiriting history* 2012)). A Test of Independence

was used to see if the choice of "No" to the inventor being Deaf and the recognition of

the system were related, because the inventor in fact is not Deaf and more individuals

recognized the system. However, the relationship is not significant,

$\chi^2(4, \text{n} = 53) = 9.04$, $p<.1$. Half of those who recognized SignWriting did not know

that the inventor is hearing. SignWriting, like si5s, had a greater number of positive

comments than negative ones. The negative comments focused on how complex the

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[13] Three individuals used both SignWriting and si5s

writing of each sign would be; on the other hand, many appreciated its iconicity leading to immediate interpretation.

Also like si5s, the way the survey was advertised may have caused the increased number of those who recognized and used SignWriting. Some of those in the researcher's network are familiar with and are proponents of SignWriting. If those individuals shared the survey with their networks, then conceivably more individuals would recognize SignWriting. On the other hand, si5s and SignWriting both have numerous blogs, seminars, classes, and proponents who campaign for their use. The increase of use may also reflect this. Of the researcher's personal network, those she knows to use SignWriting or si5s are not the same individuals. Therefore, those who use both may reflect the campaigning of supporters of either system rather than the pool of the researcher's network. Further research into both systems and their use would be needed to fully understand the relationship seen here.

5.1.8   Stokoe Notation

Stokoe Notation is the oldest writing system featured on the survey and is well known by sign language researchers. Nevertheless, the majority of the respondents did not recognize it, $\chi^2(4,\ n\ =\ 53)\ =\ 31.54,\ p<.001$. Three claimed to use Stokoe Notation. Over half of the respondents answered "No" to whether the inventor was Deaf. Because there is a trend of the respondents to choose "No" for the hearing status of the inventor, it is ambiguous whether these replies reflect the respondents' actual knowledge

of Stokoe's hearing status, which was hearing. [14] Respondents A5UDJWJSHG and DE4YZNE632, who recognized and used Stokoe Notation, both referred to Stokoe's dictionary in their comments, showing that that they likely knew for certain Stokoe's hearing status. Similarly, three other respondents mention Stokoe in their comments, and they either selected that Stokoe was not Deaf or that they did not know.

Some did not like that Stokoe Notation resembled English. For example, Respondent A5UDJWJSHG commented, "It is more 'alphabetic' -- my main problems with it are the use of English letters -- I prefer to see ASL disassociated with English." The comments against Stokoe Notation System were that was too linear, unintuitive, and confusing. This further shows that most of the respondents did not like a system because they could not immediately interpret how the writing system represented the sign.

5.1.9 Summary of the Response to the Writing Systems

Two themes emerge from the closed- and open-ended responses about the different writing systems. First, half of the respondents assumed that the inventor of an unfamiliar and hard-to-interpret writing system must not be Deaf. This tendency suggests that the respondents viewed reading and writing as foreign to the Deaf community or that a Deaf person would make an intuitive writing system. The open-ended remarks showed a preference toward iconicity, in contrast to the opinions stated earlier in Q26 that disfavored pictorial (i.e. iconic) representations. Systems that the respondents could quickly interpret how the characters represented the signs were seen as more intuitive and

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[14] A Test of Independence between recognition of Stokoe Notation and the knowledge of the inventor's hearing status showed the two are unrelated, $\chi^2(4,\ n\ =\ 56)\ =\ 5.92,\ ns$.

representative of ASL. Systems that featured arbitrary symbols to signify parts of signs were seen as unintuitive and foreign. Therefore, the comments reveal that iconicity, which grants immediate interpretation, does affect the opinions.

5.2   The Respondents' Closing Remarks

The respondents' closing comments reiterated the opinions of those who oppose, support, or feel ambivalent about literacy in ASL. Some oppose literacy in ASL because of the need for written English and the preference for video technology. However, one respondent (DE4YZNE632) stated, "I know so many Deaf people who think, 'There's no need for written Sign, we have videos, we have English.' I think the advent of a practical visually-based writing system would make all the difference in the world." Others see advantages to literacy in ASL but are not personally motivated for it. They recognize that it has not been widely accepted. For example, Respondent HZ237J8M9M wrote, "Si5s is the best and most natural looking written form of ASL but I don't have a lot of incentive to learn that. My kids should be exposed to that now. But sadly no."

5.3   Comparisons

A two-way chi-square test, or Test of Independence, was employed to compare the relationship of two closed-ended questions. This test was used to find potential relationships between an individual's personal desire to read and write ASL and various other factors. Beyond this thesis, the data may be analyzed to uncover other interactions.

5.3.1 Comparison of Personal Desire and Language Background

The different language backgrounds of the respondents may affect their personal desires for literacy in ASL. Three Tests of Independence compared the answers to Q18, the agree-scalar question of "I want to read and write ASL", and the answers for the three different language backgrounds: at home growing up (Q7), at home now (Q8), and at school (Q10). The results showed no statistical significant relationship between personal desire and any of the language backgrounds; Q7, $\chi^2(20,\ n = 62) = 19.22$, ns; Q8, $\chi^2(16,\ n = 62) = 24.26$, $p<.1$, ns[15]; and Q10, $\chi^2(20,\ n = 62) = 12.29$, ns. The relationship with Q8, primary language now, came close to being significant; however, the statistically weak result leaves the relationship inconclusive. The survey results do not indicate that language use is a factor influencing the desire for reading and writing ASL.

5.3.2 Level of Education as an Influence of Personal Desire

How much education a person (in the Deaf community) received may influence their desire for reading and writing ASL. The sample size of the survey could not decisively show that a relationship between level of education (Q11) and personal desire (Q18) exists, $\chi^2(20,\ n = 62) = 29.02$ $p<.1$. A greater number of responses, especially from those who did not finish high school, may provide different results.

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[15]df=16, though Q8 had 6 choices, no respondents selected "Writing back and forth" leaving five categories, resulting in df=(5-1)*(5-1)=16. Including "Writing back and forth" results in $p>.1$.

Though not statistically significant, it may be worth noting that the two who possessed a Ph.D. both strongly agreed that they wanted to read and write ASL, and the one respondent who did not finish high school disagreed.

5.3.3 Involvement in the Deaf Community and Personal Desire

The results of Q12 about involvement in the Deaf community and the results of Q18 about personal desire were compared to see if a relationship existed between (1) those who are heavily involved in the Deaf community and (2) desires for literacy in ASL. However, there was no statistically significant[16] relationship between one's involvement and one's desire for reading and writing ASL.

5.3.4 Ease of Learning English and Personal Desire

A relationship between the respondents' perceptions of how easy it was to learn English (Q13) and their desire for literacy in ASL (Q18) could be important because of the potential of literacy in ASL to bridge to literacy in English. However, there was no significant relationship between them, $\chi^2(12, \ n \ = \ 62) \ = \ 6.65, \ $ ns. The high level of education among the respondents may have influenced this outcome.

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[16] Q12 permitted multiple selections of answers, so each potential use of writing ASL was analyzed independently of the others using n = 61, the total number of respondents who answered. Treating each selection as "yes" and each blank as "no" derived the observed values. The results:
Leader: $\chi^2(4 \ n \ = \ 61) \ = \ 5$, ns; Involved with school: $\chi^2(4, \ n \ = \ 61) \ = \ 1.65$, ns; Regularly attend: $\chi^2(4, \ n \ = \ 61) \ = \ 3$, ns; Occasionally attend: $\chi^2(4, \ n \ = \ 61) \ = \ 5$, ns; and
Other: $\chi^2(4, \ n \ = \ 61) \ = \ 2.67$, ns.

5.3.5 *Self-Assessed Reading Ability and Personal Desire*

How the respondents view their reading ability may influence their desire for literacy in ASL. Comparing Q14, the self-assessment of reading a newspaper, and Q18 about personal desire showed no statistically significant relationship,

$\chi^2(16,\ n\ =\ 61)\ =\ 7.25,\ ns.$

5.3.6 *Deaf to Deaf Communication and Personal Desire*

The results of Q18, personal desire, and Q38, the agree-scalar question "If I had to write to another person—who is Deaf—I would prefer to write in ASL than in English," are related, $\chi^2(16,\ n\ =\ 61)\ =\ 35.39,\ p<.01.$ Most individuals who chose "Agree Strongly" to writing ASL to another Deaf person also chose "Agree" or "Agree Strongly" to wanting to read and write ASL. Those who chose "Disagreed Strongly" to using a written form of ASL in Deaf to Deaf communications similarly chose "Disagree" or "Disagree Strongly" to desiring literacy in ASL. This comparison thus highlights those on the opposite ends of the agree-scalar spectrum.

5.3.7 *Value of Literacy and Desire for it*

The results from Q18, personal desire, and Q16, the agree-scalar question about the importance of being able to read and write ASL, displayed a very strong relationship, $\chi^2(16,\ n\ =\ 62)\ =\ 94.29,\ p<.001.$ Those who indicated that reading and writing was extremely important also agreed or strongly agreed with wanting to read and write ASL. A respondent selecting "Somewhat Important" in Q16 often selected "Somewhat Agree"

for Q18. Likewise, those who indicated that literacy in ASL was not important strongly

disagreed[17] that they wanted to learn to read and write ASL. Many of the respondents

who chose "Important" in Q16 also chose "Somewhat Agree" in Q18, but these responses

were more varied than the other pairings. This shows that the importance people ascribe

to literacy in ASL heavily influences their personal desire for it.

Whether one thinks literacy would improve their daily life (Q19) also affects if they

desire reading and writing ASL (Q18), χ^2(16, n = 61) = 88.84, *p*<.001. Like the

comparison between Q16 and Q18, individuals frequently either agreed or disagreed with

both, rarely changing sides of the agree-scalar spectrum. Two respondents, however,

stand out as they did switch sides between Q18 and Q16 or Q19.

5.3.7.1 Vignettes of Respondents Who Did Not Fit the Trend

The use of closed- and open-ended questions allows for fuller context of the opinions

of the individual respondents who wrote in answers. This context can clarify seeming

discrepancies in responses. For example, only one individual, Respondent

Z3EA5YLPHZ, chose both "Extremely Important" to reading and writing ASL (Q16)

and "Disagree Strongly" to having a personal desire for literacy in ASL (Q18). The same

respondent strongly agreed that literacy in ASL would improve her daily life in Q19.

These three answers create a seeming paradox, given the pattern established by the

analysis above. However, this respondent explained in her comments that she never

wanted to write ASL on her own, but since her brother and friends do, she thinks it is

important for the Deaf community and is beneficial. Her answers to the questions about

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[17] One who chose "Somewhat Important" in Q16 selected "Disagree" in Q18.

the influence of social spheres similarly reflect this opinion. She agreed that her friends using a written form of ASL would influence her to learn (Q32) but indicated that the local community (Q33) and national Deaf community (Q34) using a written form did not matter to her.

As another example, Respondent A5UDJWJSHG conversely chose "Agree Strongly" for desire to read and write ASL but chose "Disagree" for if he thought it would improve his daily life. Again, his background and comments clarify these seemingly contradicting beliefs. This individual, who has a Ph.D. and showed a strong command of English in his open-ended responses, explained that his interest in reading and writing ASL was mainly for language preservation. He believed a written form of ASL allows for a permanent preservation that is more convenient than video.

These two respondents stood out because they did not fit the trend that the level of importance one gives literacy in ASL or feeling that it would improve one's daily life often corresponded to how much one desired to read and write ASL.

5.4   Conclusion

The above comparisons showed three factors affecting personal desire: (1) importance, (2) improvement to daily life, and (3) Deaf to Deaf communications. The other comparisons did not show significant factors on personal desire. The participants' high degree of education may have affected these results. Further discussion about these findings and factors appear in the following chapter.

CHAPTER 6

CONCLUSION

The Deaf community as a whole has not widely adopted literacy in ASL, despite the benefits that literacy in ASL may hold. This survey enriches the research on bilingual, biliterate education by identifying how those in the U.S. Deaf community feel about reading and writing ASL. The survey results showed that the majority of the respondents do not possess a personal felt need for literacy in ASL.

6.1   Factors

The analysis of survey results identified many factors that influenced whether or not individuals have a personal felt need for acquiring literacy in ASL. Those factors are (1) widespread use, (2) perceived value, (3) style of the writing system, (4) use with other Deaf individuals, (5) face-to-face culture, (6) video technology, and (7) preference for English.

The widespread use of a written form of ASL emerged as a factor that would persuade most of the respondents to adopt a written form of ASL. The majority of the respondents would want to learn to read ASL if reading materials existed. Also, most agreed that they would want to learn to read and write ASL if (1) their friends, (2) the local community, (3) the national Deaf community, (4) individuals they respected, or (5) Gallaudet University adopted a writing system for ASL. Therefore, if the majority of

people in the Deaf community accepted literacy in ASL, then even the respondents who lack a personal motivation would learn to read and write ASL. As Respondent X6QU8429YW explained, "Yes, [I would want to read and write ASL] if there is a standardized written system that is widely accepted by the Deaf community. Otherwise it's a moot point learning something that nobody uses."

The importance that the respondents placed on literacy and the impact that they believed it would have on their daily lives suggested how much they valued literacy in ASL. The value placed on literacy in ASL thus often predicted how much they desired it.

The style of a writing system is a factor on the respondents' opinions. The majority of the respondents initially agreed that ASL should have a written form that looks different from pictures and different from English. In the comments, however, the respondents repeatedly evaluated a writing system on how well they could immediately interpret it. The respondents commented favorably on iconic writing systems that used characters that resembled handshapes, parts of the body, and movement. Some of the respondents felt that these iconic systems would be easier to learn. Additionally, many thought that writing systems which used the English alphabet or abstract symbols were unintuitive and foreign.

Most of the respondents agreed that others in the Deaf community should acquire literacy in ASL, regardless of the respondents' own personal desire, and agreed that learning to read and write in a primary language would aid learning to read and write in a second language. In the comments, some recognized that those without a strong command of English may benefit from literacy in ASL. Those who prefer English would use of a written form of ASL in communication with other Deaf individuals who

struggled with English or preferred reading and writing ASL. Therefore, the benefits of literacy in ASL for individuals who do not have a strong command of English would motivate some to acquire literacy in ASL.

The supporters of literacy in ASL listed many factors as to why they desired to read and write ASL or already do. They believed that literacy could codify ASL and raise its prestige, making it equal to other written languages. Also, some proponents did not want to be limited by needing to translate their thoughts into English in order to write. Language preservation, documentation, and use in education arose as others factors in the supporters' comments.

The face-to-face culture of the Deaf community is a deterrent for literacy in ASL. Some perceived print literacy as foreign, coming from outside the community. This coincides with some of the respondents asserting that ASL is not a written language. Some believed that print literacy was something imposed or forced on the community from outside and represents the hearing world trying to "fix" Deaf people (Parkhurst 2011). Furthermore, some opponents pointed out that ASL has not been written throughout the history of the Deaf community.

The advent of video and communication technology led some to reject print literacy in ASL. These individuals felt that video technology could fulfill their literacy needs of language preservation and documentation, communication in ASL rather than English, and creation of ASL literature. Because they felt video was adequate, they did not desire to read and write ASL.

Familiarity with English diminished a felt need for reading and writing ASL for some of the respondents. Both those who opposed literacy in ASL and those who felt ambivalent expressed that their mastery of English fulfills their literacy needs.

6.2   Limitations

Among the limitations in this study are the issues in Q9 about type of education, as detailed in Section 4.4.2.1. Other issues also arose in the medium of the survey, the advertising techniques, and the survey design.

The online aspect of the survey may have hindered some individuals from accessing it. Those without consistent internet sources or those who do not frequently use the internet would not have had access to either advertisements for the survey or the survey itself. This may be responsible for the exclusion of key demographics, which were lacking from the sample set, such as those who are not comfortable with English and those who did not finish high school. The respondents to this survey possessed a high level of education, with only one who did not finish high school. This demographic mix is not representative of the Deaf community in the United States. Whether the opinions of those who did not finish high school would have altered the findings is unknown without further research.

The reliance of the method of advertising on the researcher's personal network may have created ambiguities in the data. For example, it is unclear whether familiarity with si5s and SignWriting is a consequence of the widespread nature of these writing systems or the influence of the snowball effect of the advertising. Similarly, the respondents' high levels of education may have resulted from the researcher's personal network. Future work with the survey would need to involve different advertising methods.

The responses to the open-ended questions also revealed design limitations. First, some of the respondents misinterpreted the survey to advocate reading and writing ASL *instead of* English rather than *in addition to* it, which may have caused these respondents to rate literacy in ASL negatively. Secondly, the ordering in which the writing systems were presented unintentionally led some respondents to compare each system to HamNoSys. More explanation or counterbalancing may have prevented this misinterpretation and ordering affect.

Because the researcher is not from the Deaf community, the survey had an etic perspective. This perspective influenced the focus of the questions, which limited what factors were identified. More collaboration with individuals from the Deaf community could develop other focuses for questions to identify other factors and benefit future use of the survey.

6.3   Next Steps

There are four possible next steps for the survey. First, an immediate next step is to share the results of this survey with those in the Deaf community, educators of students who are deaf, linguists, and literacy specialists. Second, as this sample set was limited, a larger and more representative sample size would need to be gathered to better assess the Deaf community's felt need for literacy in ASL. Third, educators, policy-makers, and community leaders could adapt the survey to assess the desires of their constituents for literacy in ASL. Fourth, advocates for literacy in ASL could use the survey as a tool to educate decision-makers.

6.4   Summary

The survey investigated if a felt need for literacy in ASL existed in the U.S. Deaf community. The results of the survey reveal equal numbers of proponents, opponents, and those who feel ambivalent about reading and writing ASL among the well-educated people who took the survey. The results may have differed if more community members who did not finish high school or who struggle with English had completed the survey. Further research into these specific demographics and a larger sample size is recommended for a more definitive assessment of the felt need for literacy in ASL. Although literacy in ASL may resolve the issues that students who are deaf face with acquiring literacy in English, an understanding of the felt need within the Deaf community is a prerequisite for a successful application of a written form of ASL in bilingual education for students who are deaf.

APPENDICES

APPENDIX A

SURVEY INTRODUCTION

Hello, My name is Jennifer Keogh.[18] I am a graduate student at the University of North Dakota. I study Linguistics. What does that mean? I study different language's structure, like their grammar and word meaning, and how people learn and use language.

I am curious about your opinions on reading and writing American Sign Language. What does it mean to read and write ASL? Like how people can write down what they speak or think in English and then read the same thing again later, people can do that same with what they think and sign in ASL. Many people have invented ways to write ASL, but very few people in the Deaf community use them.

Do you use a written form of ASL? Do you want to read and write ASL? Would you rather just use English?

This survey has three parts. Part one asks about your background information. I ask your gender, age range, and education. I will not ask for your name or address so the results are anonymous.

In part two, I ask your opinions about reading and writing ASL.

In part three, I will show you different ways to write ASL and ask how you feel about them.

The survey takes about 30 minutes to complete. It may take more time or less time.

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[18] The translator signed this in the third person, not in the first person as it was written in English

When I've gathered the survey results, I will analyze them and write them up. Then I will publish the results for distribution in the Deaf community, the linguistics community, and those who work in Deaf education and literacy.

Thank you for sharing your opinion!

Thank you for taking the time to fill out the survey!

Thank you!

For further information[19] about the privacy policy of this survey website, you can visit:

http://www.websurveycreator.com/privacy_policy.aspx

For more information regarding the University of North Dakota's research guidelines, visit:

http://und.edu/research/research-economic-development/institutional-review-board/index.cfm

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[19] The translator did not sign this sentence or the following sentence and links.

APPENDIX B

SURVEY INSTRUCTIONS BY SECTION

B.1 Section 1:

Part 1 - Your Background

Please fill out the background information.

The survey is strictly anonymous - it will not ask for your name, address, or private information.

If you do not feel comfortable answering a question, just pick "Prefer not to answer". Answering all the questions will help us when we analyze the results, but we don't want to force you to answer any questions.

B.2 Section 2:

Part Two - Your Opinions on Reading and Writing American Sign Language

B.3 Section 3:

Part 3 - Taking a Look at Different Ways to Write American Sign Language

This part now asks how you feel about these different ways to write ASL.

Watch the video with the ASL for: Snake, Enter, Don't Know, House, and Establish

Then compare the signs to the way it is written in the example.

Answer the questions about each way to write ASL.

Use the extra space to type what you think about each way to write ASL.

APPENDIX C

SURVEY QUESTIONS

Q1 You are...

    Male Female Prefer not to answer

Closed-end Single-Selection

Q2 How old are you? (If you are under 18 years old, your responses cannot be used.)

17 years old or younger	18-24	25-34	35-44	45-54	55-64	64 or older	Prefer not to answer

Closed-end Single-Selection

Q3 Please fill in yes or no: Are you D/deaf or hard-of-hearing?

          Yes   No

Closed-end Single-Selection

Q4 About what age did you become deaf or hard of hearing?

    Younger than 3 years old 3-5 6-12 12-18 18-25 25 or older Don't Know

Closed-end Single-Selection

Q5 Your mother or female who raised you is (or was)...

    Deaf Hard-of-hearing   Hearing   Not Sure

Closed-end Single-Selection

Q6 Your father or male who raised you is (or was)...

    Deaf Hard-of-hearing   Hearing   Not Sure

Closed-end Single-Selection

Q7   While growing up, what language did you use the most at home?

Fluent ASL	Some ASL	Signed English	Spoken English	Writing back and forth	Other (Please Explain)

Closed-end Single-Selection

Q8 Now, what language do you use the most at home?

| Fluent ASL | Some ASL | Signed English | Spoken English | Writing back and forth | Other (Please Explain) |

Closed-end Single-Selection

Q9 What kind of school did you attend?
  A Deaf school that you lived at
  A Deaf school that you commuted to
  Mainstreamed with an interpreter
  Mainstreamed without an interpreter
  Combination of above (Please list)
  Other (Please Explain)
Closed-end Multiple-Selection

Q10 What language were you taught in the most at school?

| Fluent ASL | Some ASL | Signed English | Spoken English | Writing back and forth | Other (Please Explain) |

Closed-end Single-Selection

Q11 What is the highest level of school you have finished?
  Did not finish High School
  High School or GED
  Associates
  Bachelors
  Masters
  Doctorate
  Prefer not to answer
Closed-end Single-Selection

Q12 How are you involved in the Deaf community? You can pick more than one.

    I am a leader in the Deaf community.

    I am involved with a Deaf school.

    I regularly attend a Deaf organization.

    I occasionally attend a Deaf organization.

    I do not attend a Deaf organization.

    Other (Explain)

Closed-end Multiple-Selection

Q13 How much do you agree with this sentence:
Learning to read and write English was easy.

    Agree Strongly   Agree   Disagree   Disagree Strongly

Closed-end Single-Selection

Q14 Let's say you read a whole newspaper.
How much of the newspaper do you understand?

    I understand the whole newspaper.

    I understand most of the newspaper.

    I understand about half of the newspaper.

    I understand some of the newspaper.

    I understand very little.

Closed-end Single-Selection

Q15 Let's say you read a whole newspaper. How much do you agree with this statement:
It is easy to read the whole newspaper.

    Agree Strongly Agree Somewhat agree Disagree Disagree Strongly

Closed-end Single-Selection

Q16 You think being able to read and write ASL is...

Extremely Important	Very Important	Important	Somewhat Important	Not Important

Closed-end Single-Selection

Q17 Why do you feel that way?

Open-ended

Q18 I want to read and write ASL.

Agree Strongly Agree Somewhat agree Disagree Disagree Strongly

Closed-end Single-Selection

Q19 Being able to read and write ASL would improve my everyday life.

Agree Strongly   Agree   Doesn't matter   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q20 Whether or not you would personally read and write ASL, individuals—who are Deaf—should have the opportunity to read and write ASL if they want.

Agree Strongly   Agree   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q21 Learning to read and write in your primary language helps learning to read and write another language.

Agree Strongly   Agree   Doesn't matter   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q22 If children—who are Deaf—learn to read and write in ASL before learning to read and write English, then they will be able to learn to read and write English better.

Agree Strongly   Agree   Doesn't matter   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q23 If an adult—who is Deaf and fluent in ASL—has difficulty reading English, then learning to read and write ASL will help him or her read and write English better.

Agree Strongly   Agree   Doesn't matter   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q24 If you could read and write ASL, what would you use it for?

Lists	Yes	No
Notes	Yes	No
Writing for School	Yes	No
Writing for Work	Yes	No
Teach Deaf children	Yes	No
Deaf Publications	Yes	No
Teach hearing people ASL	Yes	No
Emails	Yes	No
Deaf organization's laws, policies, and notes	Yes	No
Text messaging	Yes	No
Poetry or story-telling	Yes	No

Closed-ended Single-Selection

Q25 If there are other things you would use written ASL for, type them below.
Open-ended

Q26 Written ASL should look like pictures or drawings of fluent ASL.

Agree Strongly   Agree   Doesn't matter   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q27 Written ASL should look like written English.

Agree Strongly   Agree   Doesn't matter   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q28 While ASL should have a way to be written, it should look different from pictures or written English.

Agree Strongly   Agree   Doesn't matter   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q29 What do you think written ASL should look like?
Open-ended

Q30 The person who develops a way to write ASL must be Deaf.

Agree Strongly   Agree   Doesn't matter to my opinion   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q31 If people wrote books, newspapers, and other things in ASL, then I would want to learn to read and write ASL.

Agree Strongly   Agree   Doesn't matter to my opinion   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q32 If my friends—who are Deaf—read and write ASL, then I would want to learn.

Agree Strongly   Agree   Doesn't matter to my opinion   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q33 If people in my local Deaf community read and write ASL, then I would want to learn.

Agree Strongly   Agree   Doesn't matter to my opinion   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q34 If Deaf people throughout the USA read and write ASL, then I would want to learn.

Agree Strongly   Agree   Doesn't matter to my opinion   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q35 If people I respect read and write ASL, then I would want to learn it.

Agree Strongly   Agree   Doesn't matter to my opinion   Disagree   Disagree Strongly

Closed-ended Single-Selection

Q36 If Gallaudet University taught and used a way to read and write ASL, I would want to learn.

| Agree Strongly | Agree | Doesn't matter to my opinion | Disagree | Disagree Strongly |

Closed-ended Single-Selection

Q37 For written records in the Deaf community, like by-laws, emails, and newsletters, I would prefer written ASL instead of written English.

| Agree Strongly | Agree | Doesn't matter to my opinion | Disagree | Disagree Strongly |

Closed-ended Single-Selection

Q38 If I had to write to another person—who is Deaf—I would prefer to write in ASL than in English.

| Agree Strongly | Agree | Doesn't matter to my opinion | Disagree | Disagree Strongly |

Closed-ended Single-Selection

Q39 Do you want to learn to read and write ASL? Why or why not? Please explain. You can type as much as you want—there is no space limit.
Open-ended

Q40 English Gloss

Do you recognize this way to write ASL?	Yes	No	I don't Know	*Closed-end Single-Selection*
Do you use this way?	Yes	No	I don't Know	*Closed-end Single-Selection*
Is the inventor Deaf?	Yes	No	I don't Know	*Closed-end Single-Selection*

Q41 What do you think about this way to write ASL? *Open-ended*

Q42 HamNoSys

Do you recognize this way to write ASL?	Yes	No	I don't Know	*Closed-end Single-Selection*
Do you use this way?	Yes	No	I don't Know	*Closed-end Single-Selection*
Is the inventor Deaf?	Yes	No	I don't Know	*Closed-end Single-Selection*

Q43 What do you think about this way to write ASL?   *Open-ended*

Q44 Scriptus

Do you recognize this way to write ASL?	Yes	No	I don't Know	*Closed-end Single-Selection*
Do you use this way?	Yes	No	I don't Know	*Closed-end Single-Selection*
Is the inventor Deaf?	Yes	No	I don't Know	*Closed-end Single-Selection*

Q45 What do you think about this way to write ASL?   *Open-ended*

Q46 si5s

Do you recognize this way to write ASL?	Yes	No	I don't Know	*Closed-end Single-Selection*
Do you use this way?	Yes	No	I don't Know	*Closed-end Single-Selection*
Is the inventor Deaf?	Yes	No	I don't Know	*Closed-end Single-Selection*

Q47 What do you think about this way to write ASL?   *Open-ended*

Q48 SignFont

Do you recognize this way to write ASL?	Yes	No	I don't Know	*Closed-end Single-Selection*
Do you use this way?	Yes	No	I don't Know	*Closed-end Single-Selection*
Is the inventor Deaf?	Yes	No	I don't Know	*Closed-end Single-Selection*

Q49 What do you think about this way to write ASL? *Open-ended*

Q50 SignSys

Do you recognize this way to write ASL?	Yes	No	I don't Know	*Closed-end Single-Selection*
Do you use this way?	Yes	No	I don't Know	*Closed-end Single-Selection*
Is the inventor Deaf?	Yes	No	I don't Know	*Closed-end Single-Selection*

Q51 What do you think about this way to write ASL? *Open-ended*

Q52 SignWriting

Do you recognize this way to write ASL?	Yes	No	I don't Know	*Closed-end Single-Selection*
Do you use this way?	Yes	No	I don't Know	*Closed-end Single-Selection*
Is the inventor Deaf?	Yes	No	I don't Know	*Closed-end Single-Selection*

Q53 What do you think about this way to write ASL? *Open-ended*

Q54   Stokoe Notation

Do you recognize this way to write ASL?	Yes	No	I don't Know	*Closed-end Single-Selection*
Do you use this way?	Yes	No	I don't Know	*Closed-end Single-Selection*
Is the inventor Deaf?	Yes	No	I don't Know	*Closed-end Single-Selection*

Q55   What do you think about this way to write ASL?   *Open-ended*

Q56   Do you know or use another way to read and write ASL? If yes, explain.
Open-ended

Q57   Do you have other opinions, thoughts, or feelings that you want to share? Type them below. You can type as much as you want—there is no space limit.
Open-ended

APPENDIX D

DIGITAL APPENDIX OF SURVEY RESPONSES

A digital appendix is included because of the large amount data from the surveys responses. This appendix includes the answers of the 62 respondents to each of the survey questions and their open-ended responses.

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