

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF LINGUISTICS

VARIATION IN AMERICAN SIGN LANGUAGE

MARIA FLECK
SPRING 2019

A thesis
submitted in partial fulfillment
of the requirements
for baccalaureate degrees
in Letters, Arts, Sciences and French and Francophone Studies
with honors in Linguistics

Reviewed and approved* by the following:

Matthew Carlson
Assistant Professor of Spanish and Linguistics
Thesis Supervisor

John Lipski
Professor of Spanish and Linguistics
Honors Adviser

* Signatures are on file in the Schreyer Honors College.

ABSTRACT

Sign language variation is only a recently studied topic within the field of sign language linguistics. Current studies being completed by the Philadelphia Signs Project are making new discoveries about the existence of an “old Philadelphia sign” that exists in the older generation of Philadelphia’s Deaf community, but not in the younger generations of signers in the Philadelphia Deaf community today. This study seeks to explore the possibility of a sign variation in different generations of signers from Pittsburgh, Pennsylvania. Each sign, like in spoken language, is comprised of several meaningless elements which come together to create meaning. These meaningless elements are seen in the features of handshape, movement, location, and orientation of the manual modality of sign language. It is changes in these meaningless elements which create variation. To begin exploring the variation which exists in Pittsburgh, native signers from Pittsburgh who were either 18 to 35 years old or 50 or more years old were sought out as participants. Each participant was asked to give a sign and three sentences containing that sign for a variety of images. Many of the given signs demonstrated a variety of variation in the expected features. Overall, evidence was found for core features of every signs and areas in which variation is more likely to occur. The results of the data demonstrate vast opportunity for the modality of sign to influence sign language variation.

TABLE OF CONTENTS

LIST OF FIGURES	iii
ACKNOWLEDGEMENTS	iv
Chapter 1 Introduction	1
Chapter 2 Methods	10
Participants	10
Materials.....	11
Procedure	14
Coding.....	15
Chapter 3 Results	17
Chapter 4 Discussion	22
Chapter 5 Conclusion.....	31
Appendix A.....	32
Appendix B	33
Appendix C	35
BIBLIOGRAPHY	36

LIST OF FIGURES

Figure 1. T handshape (left); S handshape (right)	18
Figure 2. B handshape with thumb extension in-between B and OB expected feature	18
Figure 3. F handshape (upper left); 8 handshape (upper middle); F handshape CAT variation (upper right); F handshape FOX variation (bottom middle)	19
Figure 4. APPLE with location by chin (left); ONION with location by temple/eye (right)	20
Figure 5. BOY sign made around torso (left); BOY sign made around the forehead (right)	23
Figure 6. S handshape (left); F handshape (right).....	25
Figure 7. FORK expected sign (left); FORK more iconic sign (right).....	26
Figure 8. Days of the week variation signs; Monday (left), Tuesday (middle), Wednesday (right)	29
Figure 9. Days of the week expected signs; Monday (left), Tuesday (right).....	29

ACKNOWLEDGEMENTS

Undertaking this work would not have been possible without the efforts of many individuals. First, I would like to thank my thesis supervisor, Dr. Matthew Carlson, who has guided me through every aspect of this project and who was willing to learn along the way with me. My gratitude for him during this project is immeasurable. I would like to express my thanks to my thesis advisor, Dr. John Lipski, who read through this work and offered advice. I would also like to thank Sommar Chilton who helped get this project off the ground by sharing her knowledge and passion for American Sign Language. There are several others for whom my thanks go out. To Kenneth DeHaan and Nicholas Mastromatteo, who connected me to members of the Deaf community of Pittsburgh and who shared what knowledge they could give of their native language. To Ashely Bennet, who is a certified ASL translator, for translating my IRB consent form into ASL. To Dr. Meredith Tamminga, who shared her knowledge and her current research and who helped guide me toward the project written here today. I would also like to express my thanks to the College of the Liberal Arts and the Schreyer Honors College who gave me the opportunity and the funding necessary to pursue my interests. Finally, but certainly not least, to my advisors, friends, and family without whom I could not have had the wherewithal to finish this project.

Chapter 1

Introduction

It has recently been demonstrated that spoken languages and signed languages share many more commonalities than what had once been believed. These commonalities are prevalent in research conducted on sign language variation. In spoken language, variation in speech sounds can be construed as accents and this study seeks to find comparisons in American Sign Language. The existence of sign language variation has been found in recent studies published in Philadelphia with the discovery of a sign unique to older signers from the Philadelphia area. The existence of a sign language accent between different generations of signers in one geographical location creates some interesting questions about the scope of variation in American Sign Language. This study explores the range of ways individuals might produce the same sign and what are and what is similar and different between manual vs. spoken modality in language production and language variation in different generational signers from Pittsburgh, Pennsylvania.

The relatively recent recognition of the study of sign languages has opened unparalleled opportunities in the field of linguistics. One of the most unique opportunities afforded by the start to the study of sign language is the growing relationship between sign language and the study of phonology. Sign language, which has a different modality than the more commonly studied spoken languages, does not fall under the umbrella of what the study of phonology usually investigates. The SIL International Linguistic glossary defines phonology as “the study of how sounds are organized and used in natural languages.” As sign language has a manual

form of articulation, this definition would exclude sign from what is usually considered phonology. With the recent application of sign language to the study of phonology, linguists have taken a greater interest in what the true definition of phonology is and how it can be applied to both spoken and signed languages.

The field of phonology can be used to expand a language and to make finer distinctions in communication (Sandler, 2017). Of course, sign languages do not have speech sounds as the modality is entirely different, but what is important in phonology is not the presence of sound, but the organization of meaningless elements into meaningful ones. In spoken languages, these meaningless elements are individual sounds produced using the tongue, lips, mouth, teeth, nasal cavity and voice box as articulators. As is seen in spoken languages around the world, these individual sounds come together to form words in very systematic ways. Sign language, which has a manual modality rather than a sound modality, also has meaningless elements and units which can be organized to function in meaningful ways. This is demonstrated through variations of handshape, movement, location, orientation, and variations in facial expressions. These features are combined to create signs in sign language (Sandler 1995; cited by Emmorey 2002).

Other than the features already mentioned, in sign language, signs are made in a variety of ways and this too can impact meaning. There are one-handed signs that are done with the signer's dominant hand (this can be left or right depending on the individual's preferences), two-handed signs, and non-manual signs such as facial expression, head movements, and body movements and they may occur simultaneously with hand configurations (Emmorey, 2002). Changes in these features have a variety of functions but they are frequently used in a grammatical or an intonational manner.

As was previously mentioned, phonology can be used to expand a language and to make finer distinctions in communication. This systemic organization is a crucial part of language expression because changes in relatively small details can completely change the meaning without entirely changing the sign. Phonological features create far more complex languages (Aronoff, 2007). They are useful linguistic tools in both spoken and signed languages and they create linguistic phenomenon such as minimal pairs. For example, the minimal pair ‘pat’ and ‘bat’ only has one difference between them which is the voicing of the word initial bilabial stop. Sign languages also have minimal pairs when one of the phonological categories is changed; an A hand configuration by the cheek with a twisting motion is the ASL sign for APPLE, but a pointing finger hand configuration with the same location and movement is the ASL sign for CANDY; this is a minimal pair in sign language (Goldin-Meadow and Brentari, 2015). Phonological features allow language to change not only by the smallest detail, thereby changing the meaning, but they can also change by large details that do not change the meaning, because these changes are examples of variations. Rather than distinguishing between entirely different lexical items, variation in phonological features allow for unique changes between individuals of a single, specific language. This type of variation can be considered an accent.

Accents are typically considered to exist due to variations in speech sounds. These variations are caused by factors such as sounds that do not exist in their L1, rules or constraints that exist or do not exist in their L1, or growing up hearing sounds in a particular social or geographical setting (Frishberg, 1975). In spoken languages, variation in speech sounds is one of the first things an individual without that accent will notice, however the ability to decipher how they sound different is more difficult to explain. Forms of variation are easier to identify: foreign accents, certain well-known regional accents, and generational accents for example.

As the linguistic community now knows, the field of phonology is applicable to sign languages, so the concept of sign language variation needs to be further considered. Instead of variability in speech sounds which create an accent, sign languages demonstrate variability in their phonological features of handshape, movement, orientation, and location (Stokoe, 1960; cited by Emmorey, 2002). This variability would be due to factors such as, culture, society, region, first language, generational differences, etc. Just as each word in spoken languages can be slightly different depending on the speaker, so too does this variation exist in sign language. For example, a sign may vary depending on the thumb extension in the handshape of the sign (Battison, Markowicz, & Woodard, 1975; cited by Lucas Bayley, Rose, & Wulf, 2002). This would be a variation in handshape. Another study by Woodward, Erting, and Oliver (1976) examined face-to-hand location variation in signs to determine why some signs were made on the face in some geographical locations but on the hands in others (cited by Lucas, Bayley, Rose, & Wulf, 2002). A video done by the University of Pennsylvania demonstrated that another example of variation occurs with the 'P' handshape where usually the middle and pointer fingers point down in a v shape with the thumb in between the two. However, some older generations of signers demonstrate an accent where signers only point their pointer finger and thumb downward without the middle finger (Linguistics, 2017). This is another example of variation in handshape. Other forms of variation include degrees of movement, degree of orientation, etc. However, the differences in signs are significantly more complex and understudied. Sounds in spoken languages produced by articulators are located in a much smaller space compared to that of the signing space available to sign languages. All of the sounds in spoken languages are created within the mouth by the articulators there. Sign languages on the other hand have an

entire signing space that encompasses the entire body. The complex nature of the signing space leads to questions about the range of variation in sign.

One of the greatest challenges in studying sign language variation is the understudied range of variability available to a language with a manual modality. In comparing spoken and signed language phonology, the core properties such as features, feature categories, and constraints on form exist in both naturally occurring language modalities (Sandler, 2017). However, the differences inherent between the two modalities allows for distinctions to be made about the aspects of phonology that are conditioned for a physical system and the properties that are universal regardless of modality (Sandler, 2017). Some of the properties of signed and spoken languages that are similar go beyond the features and their categories (Brentari, 1998; Liddell & Johnson, 1989; Sandler, 1989; cited by Goldin-Meadow and Brentari, 2015). Sign can also have syllabic and prosodic structure very similar to those found in spoken languages (Brentari, 1990a; 1990b; 1990c; Perlmutter 1992; Sandler, 2010; 2012b; cited by Goldin-Meadow and Brentari, 2015). However, one concept which appears to exist in greater quantities in sign languages like ASL, rather than in spoken languages is iconicity.

One of the most interesting topics in the linguistics of sign language is iconicity. In past discussions of whether sign language can be considered a language, some linguists claimed that sign language was not arbitrary because some signs look like the objects they represent. Sign language, as a visual language, has resources for more directly communicating and replicating the visual aspects of the world around us. Iconicity is a central component of all levels of a visual language, including the phonology (Sandler, 2017). This ability to create variation based off the objects in the world can create greater variation because a sign may change to reflect real-world images (Aronoff, 2017). However, iconicity can also further complicate the discussion of sign

languages and phonology due to recent discoveries with the Al-Sayyid Bedouin Sign Language (ABSL). This sign language does not have a phonological system that exists in other sign languages such as ASL. Aronoff and colleagues argue that there is no system of discrete meaningless elements within words in ABSL. It is hypothesized that ABSL has been able to develop into a full-fledged linguistic system without the benefit of phonology. While ABSL is a part of a small speech community and it is young language with a small vocabulary, all of which effect the existence of phonology, there is also the concept that because of “the visual medium of signing, which has many more dimensions than sound does, and which allows for direct iconicity” that ABSL does not yet require phonology (Aronoff, 2017). It may be that ABSL will develop phonology as it matures, perhaps simply as a function of the size of its vocabulary. Other studies have also agreed that phonology does not appear entirely over time and that the “iconic relations between form and meaning are a resource exploited by language” (Perniss et al. 2010, Dingemanse et al. 2015; cited by Sandler, 2017). This type of variation is one that needs to be further examined due to the relatively unexplored nature of a manual modality.

Variation can exist due to a variety of factors. One such accepted linguistic group is a comparison of variation across generations. Are there significant changes which occur between generations? Younger generations are usually more in touch with other individuals around the country and the globe due to exposure with social media. Older generations generally did not have the exposure to the rest of the world that social media allows. This variability in generations creates the hypothesis that younger generations of signers would have a more universal sign accent, whereas older generations of signers would have a sign accent based on the Deaf community in which they grew up.

Research completed on sign language variation has demonstrated that sign language, like spoken language, is subject to multiple linguistic and social constraints (Ceil et al., 2002). However, a significant number of the studies completed have only gathered data from smaller samples of individuals, and the results that have been gathered have only begun to create an idea of the complex internal and external factors which influence variation in ASL or any other sign language. There yet remains no concise picture of the dialect geography of ASL (Ceil et al., 2002). More than that, it is difficult for researchers to compare sign language studies from different regions at all due to the complete lack of an ASL corpus (Fisher, Hochgesang, Tamminga, 2018). While websites do exist, such as Sign Savvy, which demonstrate some of the lexical varieties of ASL, these websites are not comprehensive nor naturalistic as they only demonstrate prescriptive signs.

As previously mentioned, there has been very little work done in the way of studies of sign language accents. However, one recent study has started to pave the way for sign language accent research. The Philadelphia Signs Project is a recent group effort originating at the University of Pennsylvania whose goal is to collect data from native Philadelphia signers to identify a “unique” Philadelphia sign accent and to then catalogue the ASL used in Philadelphia for future reference so that this unique sign, which exists in many older signers in the community, is not lost.

The Philadelphia Signs Project has completed a pilot study, initial observations and data collection, and the beginning of the analysis and coding of a main ASL corpus. This work has included the coding of more than 466 signs. Through this work, a uniquely Philadelphian ASL accent was identified. The Philadelphia Signs Project has also completed a pilot study on weak-hand variation in Philadelphia ASL. They hypothesize that one-handed signs will become two-

handed when made below the neck and two-handed signs will become one-handed when made around the head (Fisher, Hochhesang, Tamminga, 2018). In this pilot study, the researchers stated that more research would be necessary on this topic as the data was not conclusive and required further analysis. In the previous data collection of Philadelphia signs, the researchers also stated that studies would have to be completed on other communities to examine if this uniqueness in signing accent is the same. Overall, these preliminary studies have opened the doors for this type of phonological research on ASL.

The Philadelphia Signs Project also identified a pressure toward leveling. Many of the younger generation of signers have a greater connection with the world outside of their individual communities. This is brought on by the increased accessibility of technology and travel. This leveling is evidence for the disappearance of the Philadelphia sign accent. The researchers observed the leveling to be occurring between the older generations, who still utilized the unique form of Philadelphia sign, and the younger generations who had begun to use more universal, pan-regional varieties. In some cases, such as signs for WOMAN, the signs are demonstrating a co-existence and blending of variants. The “old” signs and the “new” signs are blending together. If this dialect leveling is occurring in the eastern half of the state of Pennsylvania it stands to reason that the possibility of leveling may exist in the western half of the state (Fisher, Hochgesang, Tamminga, 2018).

To explore how individuals may vary in their signing of known lexical items this research focuses on a difference between older and younger generations of signers from the Pittsburgh Deaf community. This study hypothesizes that these the differences between these generations results in a generational accent whereby older signers have more unique signs and younger signers have either adapted “old” and “new” signs from exposure to the older signs in their

communities and the newer signs from their greater access to global connections or have completely assimilated a preference for a pan-regional variety (Fisher, Hochgesang, Tamminga, 2018). According to the research completed by the Philadelphia Signs Project, this leveling is occurring in Philadelphia.

By exploring the different phonological features of lexical items of ASL in the Pittsburgh area, we aim to understand whether sign language variation within different individual communities has distinct similarities. This study seeks to explore variation of deaf signers from Pittsburgh by looking at signs demonstrated by three different signers from a younger and older generation of individuals who grew up in the Pittsburgh area.

Chapter 2

Methods

Participants

The participants of this study had to be deaf, native ASL signers who were also native of Pittsburgh, Pennsylvania. Individuals from two groups of Pittsburgh signers were chosen. Participants had to be between 18 and 35 or 50 or more years old. Minors were not accepted. Due to the added possibility of variabilities, individuals with cochlear implants were excluded.

The Deaf community of Pittsburgh, Pennsylvania is a very specific, very limited group through which to find participants. The participants in this study were found through a variety of means. An ASL instructor at the Pennsylvania State University connected with colleagues and connections she has in Pittsburgh. She offered connections with deaf individuals from Pittsburgh who were informed of the purpose of this study and what participant criteria was necessary for participation. These individuals offered advice on ways to connect with the close-knit Deaf community. A flyer with participant criteria, study details, and researcher contact information was uploaded to various Facebook groups for the Deaf community of Pittsburgh. Participants were also asked to inform their friends, family, and colleagues about the purpose and criteria of this research and to share the researcher's contact information.

Participant 1 is a native ASL signer from Pittsburgh. He learned ASL before learning English, though he is fluent in both. He learned them at around 3 years old. ASL is his stronger language. He is 29 years old, placing him in the category for the younger generation of signers.

He grew up in the Pittsburgh area, and although he has moved to several different cities in other states, he lives in Pittsburgh currently. His parents are hearing. He signs with his parents, friends, and other family members. His English literacy skills were rated as a 10 on a scale of 1 to 10 with 10 being a native speaker. He did not attend a school for the deaf.

Participant 2 is a native ASL signer from Pittsburgh. She learned ASL at 6 years old before learning English at the high school and university level. Her English reading proficiency remains at a lower level. ASL is her stronger language. She is 50 years old, placing her in the category for the older generation of signers. She grew up in the Pittsburgh area, but she has moved around to other locations across the country before currently living in the Pittsburgh area again. Her parents are hearing, and her brother is deaf.

Participant 3 is a native ASL signer from Pittsburgh. He learned ASL at 3 years old around the same time as he learned English, and his English reading proficiency is at a high level. ASL is his stronger language. He is 60 years old, placing him in the category for the older generation of signers. He grew up in the Pittsburgh area. His parents are hearing. He has moved around to different areas for work and schooling, but he currently lives in the Pittsburgh area again as well. He went to a Deaf school growing up but went to a college for the hearing and deaf.

Materials

The materials necessary for this research consisted of a paper consent form and a video consent form, two HD video cameras, two tripods, a laptop computer with PowerPoint capabilities, the testing PowerPoint presentation, and the final questionnaire. The PowerPoint

presentation consisted of 41 images of concrete objects, with the first image used as a practice item.

Images were chosen based on targeted features and ease of recognition. Each image had a targeted feature (handshape, location, movement) that was being analysed (See Appendix B and Appendix C). The targeted features were chosen due to various groupings of the signs. Signs with certain handshapes such as OB, B, X, S and F were chosen for comparison and individual features which were unique to those handshapes were then further analysed. The thumb extension of the OB and B handshape, the extension of the pointer finger in the X handshape, the location of the thumb in the S handshape, and the degree of contact between the pointer finger and thumb in the F handshape were all expected features that were analysed for degrees of difference. The similarities between the movements of signs for each signed sentence was analysed. Movement in sign is the most varied of all the features and finding comparisons between signs for simplistic objects was a difficult aspect of this study. Expected features involving movement were chosen based on more simplistic movements in the sign such as double taping fists together in the sign for TRUCK or the two-handed circle motion for DONUT. Finally, the degree of location in relation to the body was analysed as well. Signs like ONION and APPLE, minimal pairs, were analysed and compared because their locations were their only differing features. The locations where these signs occurred and their degree of touching the body, to gain an idea of a range in ASL variation, were examined.

As was previously stated, the unexplored range of sign language variation has created the necessity for a large range of targeted features. Each image was also an easily recognizable object to eliminate any confusion on the part of the participants in identifying the identifying the object and giving the appropriate sign needed for analysis. These images were collected from the

Journal of Language and Memory (Gerrig & Rastle, 2019, 02). Each image was a concrete item which has a corresponding sign in ASL. Each participant watched one of two presentations. The slides were randomly arranged and then cut in half. Presentation 1 started with the first half of the slides first, and presentation 2 started with the first half of the slides second. Each participant was randomly assigned either presentation 1 or presentation 2. This process was done to ensure that the arrangement of the images was not playing a role on the way the signs were completed.

These images were randomly ordered while also ensuring that signs with similar expected features were not clumped together. Due to similarities in the images BOAT and CANOE, these signs were flipped to ensure that BOAT came first in the order of images. This problem was discovered when the first participant gave the sign for BOAT when he saw the image for CANOE because CANOE came first in the list of images. However, he realized that we wanted two different signs for CANOE and BOAT when he saw the image for the sign BOAT later in the list of images. To prevent this miscomprehension with later participants, the two images were flipped.

The concluding questionnaire asked a combination of background and follow-up questions. These questions were signed by the investigator and the participants responded via sign as well. The goal of the background component of the questionnaire was to first ensure that each participant fit the study criteria again in case of miscomprehension when recruited. The goal of the follow-up component of the questionnaire was to gain some insight into sign language variation from the perspective of those who sign daily in the Deaf community of Pittsburgh. These individuals may have witnessed or recognized sign language variation that does not come across in the study and their opinion was useful toward the goal of this study (See Appendix A).

Procedure

All the participants were contacted first via email to determine some background information to determine that each participant fit the necessary criteria. Upon being approved for the study, each participant was asked for time availability and a location was found that was beneficial for the participant while also remaining a quiet, private area.

One of the questions asked in the first contact email determined the English literacy skills of each participant. This allowed the researcher to determine if a written consent form was enough to receive consent or if the premade video consent form was necessary for consent comprehension. Because some ASL users, especially those in the older generation of signers, do not have a high level of English literacy, a video containing a translated version of the study consent form into ASL was created. This video was completed by a certified interpreter of ASL. When participants arrived, the following consent procedure was followed: participants with higher literacy skills were given the written form of the consent form to read and sign. Participants with lower literacy skills were asked to watch the translated version of the written consent form into ASL where they were then given the written consent form to sign.

Two cameras were set up around the participant to obtain recordings from different angles. One camera was set up to record a close-up profile of the participants signing from their dominant hand side if the testing room allowed. The second camera was set up to record the front view of the participant signing.

An examiner asked each of the participants to watch a PowerPoint presentation consisting of 41 images. For all the images, the participants were asked to identify the image, give the corresponding sign, and then use that sign in three sentences. The first image is a practice image to make sure that the instructions are understood. After completion of all the images, the

participant is then asked more complex background information and follow-up interview questions which they signed back to the examiner. Each of these sessions was video recorded using two different cameras. One camera had a close-up of the individual signs being used and the other camera had a wider angle of the room. The video data recorded was saved for later coding.

Coding

The coding for this study was complex (See Appendix B and Appendix C). For starters, as ASL is a visual-spatial language there is no writing system for ASL. However, it is possible to gloss sign language. Glossing refers to writing one language in another language. Sign language written in gloss is written in all capital letters. When the sign for an object is mentioned it will be written in all capital letters and this system includes the ASL alphabet. Coding was done by identifying the specific feature for each sign and then labelling those features. First, the dominant hands (Dom) and the nondominant hands (Nondom) were labelled as these hands have different handshapes, movements, and locations, depending on the sign. The dominant hand depends on the handedness of the signer. Left handed signers are left hand dominant, such as participant 3, and right-handed signers are right hand dominant, such as participants 1 and 2. The features were broken up into the main features of handshape (HS), movement (Move), and location (LT). From there more specific features were chosen from each of the main features. The thumb position of the OB (open B) handshape was analysed for several of the signs. For the location signs, the location touching (LT) was analysed along with the degree of touch; whether the sign was completely touching (CT) the location, partially touching (PT), or no touch (NT). The coding for

the movement of the signs was the most complex, as the movements of signs varied the most significantly. These movements were mostly explained as accurately as possible. The handshape was given for each sign as another means of separation in the analysis of the signs concluding data collection. The handshapes which have two signs and a : in-between the signs signifies a two-handed sign. For example, B : B demonstrates a two-handed sign that has both the dominant hand (the first B) and the nondominant hand with the B handshape. The coding table was separated by participant, list order of the signs, the objects, time of the initiation of the sign, initial sign, first sentence, second sentence, third sentence, and observations.

Chapter 3

Results

Most of the initial signs given by all three participants demonstrated the expected feature. However, the sentences that followed demonstrated more differences amongst the three participants. Throughout the three sentences, participant 1, who was the signer from the younger generation, had a larger number of signs which adhered to their expected features, but participants 2 and 3, who were signers from the older generation, had more variability in their signs in general.

There were a few signs which did not demonstrate variation amongst individual signs between participants but instead the participants would demonstrate lexical variation. During data collection, each participant gave a completely different sign for DONUT and CAKE. These objects have a variety of signs which are almost entirely different, but they represent the same object which is not variation of the same sign with the same meaning.

The expected features of each sign were determined by the features inherent to that sign. Due to the wide range of variability in movements, most of the expected features pertained to the feature of handshape. Handshapes demonstrated the most unique quality of variability. Handshapes with fewer opportunities for variation, such as S, T, X, and A (See Figure 1.) almost always demonstrated their expected features with little variation. If any of these handshapes vary by small degrees than their meaning is entirely different. Any variation that did occur was not significant. This was evidenced in the sign for CAR which is a two-handed sign using S

handshapes (See Figure 1.). This sign did not deviate from its expected features for all three participants.



Figure 1. T handshape (left); S handshape (right)

The B and OB handshapes, however, are particularly interesting. Many of the signs were expected to have features connected with the B handshape or the OB handshape. The greatest difference between these two handshapes are the relative difference of the thumbs, but many of the signs with these handshapes demonstrated a thumb position in-between the two expected features (See Figure 2). In other words, the thumb was neither completely extended as expected in the OB handshape, nor was it completely resting on the palm of the hand, such as in the B handshape. While this did not occur in all instances, such as with the sign for DOOR, but it did occur frequently such as in the sign for FLOOR (See Figure 2. (left image)).

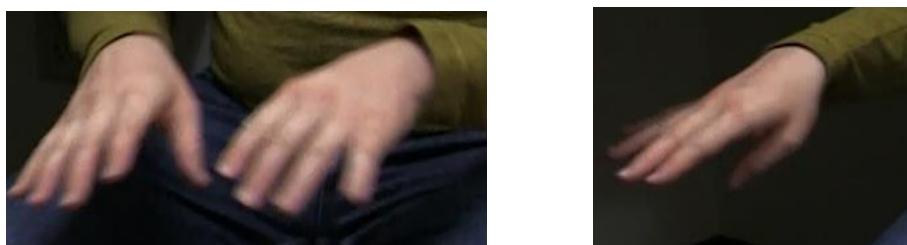


Figure 2. B handshape with thumb extension in-between B and OB expected feature

The F handshape demonstrated the most interesting data from the three participants. The signs involving the F handshape (see Figure 3.): CAT, FRUIT, and FOX had the most variability without completely changing the sign amongst the three participants. Participant 1 had little variation with this feature, but participants 2 and 3 of the older generation, had significant amounts of variability. For the sign for CAT participant 2 demonstrated signs for varied forms. One of her CAT signs used the 8 handshape (See Figure 3.) where the middle finger and thumb meet in a movement rather than the pointer finger and thumb. Participant 2's preferred sign for CAT involved dropping the other fingers (See Figure 3.). She also demonstrated the ability of this sign to be both one-handed and two-handed in the figure below. Participant 3 also demonstrated variability with the F handshape with the sign for FOX. This participant curled his point finger under his thumb instead of having his fingertips meet (See Figure 3.).

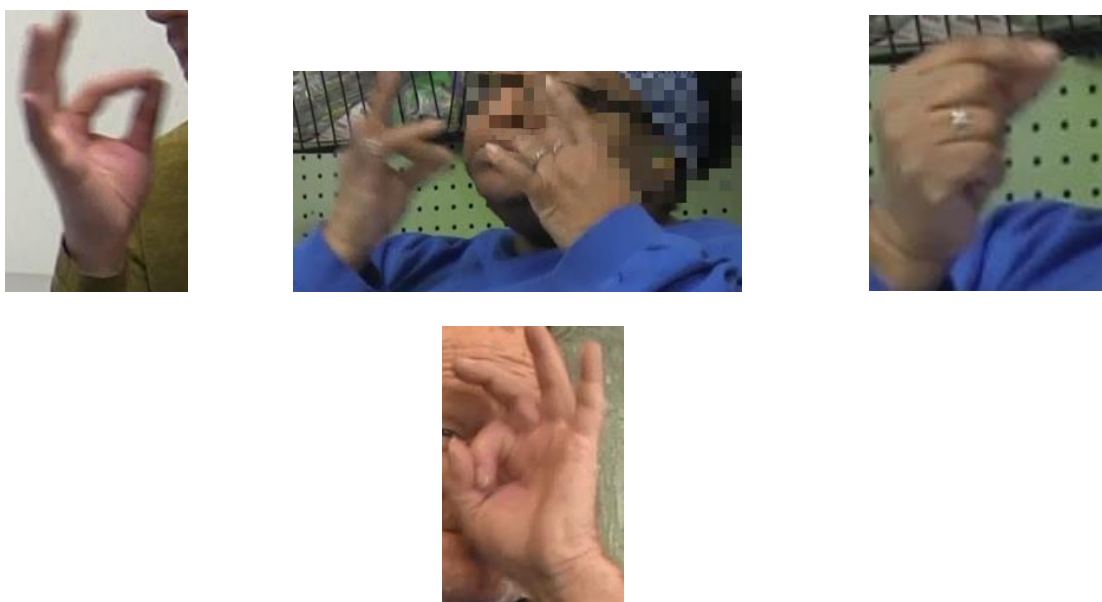


Figure 3. F handshape (upper left); 8 handshape (upper middle); F handshape CAT variation (upper right); F handshape FOX variation (bottom middle)

Most of the signs with location features varied only minimally. While some of the signs were not at their expected locations or they did not completely touch a specific location as

expected, all the location signs were generally in the expected location. However, it did appear that some locations in the signing space were broken down more specifically such as upper and lower face and the amount of precision required in those areas differed as well. As previously mentioned, the signs for APPLE and ONION have the same movement and the same X handshape. The only difference occurs with location. Participant 1 did not have either of these signs in the expected location but ONION, which was expected to be at the temple still occurred in the upper half of the face and APPLE, which was expected to occur on the cheek still occurred in the lower half of the face (See Image 4.). Whereas some of the signs around the torso or neutral area of the body differed in larger amounts without changing the meaning, the signs around the face, which is a smaller signing space, were more precise. The only outstanding sign that did not occur at its expected location at times during data collection was BOY. Participant 1 signed BOY in the neutral space around his chest more and more as the sentences continued rather than at his forehead as expected.



Figure 4. APPLE with location by chin (left); ONION with location by temple/eye (right)

Out of all the features of sign language, movement is the most variable depending on the conversation and the purpose of the sign. Many of the sign's movements varied depending on what the object was doing in the sentence. The sign for SCISSORS for example changed throughout each sentence by each participant depending on what the scissors were cutting or

doing in the sentence. Other signs, such as CAT by participants 1 and 2, would completely abandon the movement associated with the sign, but the handshape would remain prescriptive.

While there were several signs that were iconic, three signs in particular demonstrated variability by adhering to a greater level of iconicity. HAT, FORK, and SANDWICH are a few of the iconic signs that demonstrated variation which occurred for the sign to look more iconic. The expected feature for HAT was demonstrated by all the participants but participant 1 and participant 3 gave several examples of other variations of the sign for HAT depending on the type of hat being discussed. These variations were generally the same, with location occurring around the head and a similar wrist flick movement, but the handshape would change depending on the type of hat in question. A baseball cap used an A handshape for example. The signs for FORK and SANDWICH were made more iconic by participant 3. For FORK, this participant used three fingers instead of the expected two. For SANDWICH, participant 3 gave a sign that mimed the action of holding and eating a sandwich to demonstrate this sign.

Chapter 4

Discussion

While the number of participants interviewed for this study does not allow for any concrete evidence of a generational ASL accent for Pittsburgh, there is evidence for significant amounts of variability in signs amongst the three signers. Some of the demonstrations of variability were substantial while others were not. In the signs given during this study, several of the signs demonstrated forms of variability over the course of the three sentences they were asked to give for each sign. For starters, some of the participants would give entirely different forms of lexical variation of the sign. DONUT and CAKE were two signs which were signed differently by each participant. While this data is interesting, especially as one of the signs for DONUT was one that researchers on this study had never seen before, it is not evidence for phonological variation in sign language.

Some evidence of natural language variation occurred as well. As with all studies involving the field of sociolinguistics, the complexities of recreating a natural language environment are continuously difficult, but the Deaf community remains especially difficult to study naturally. As evidenced by previous studies, many deaf individuals from the Deaf community sign differently to non-signers and non-deaf individuals (Fisher, Hochgesang, Tamminga, 2018). Beyond this fact, interviews are never a natural environment either. This created some difficulties in determining what portions of the data were natural language and what was not. Some evidence of natural language was also initially confused with possible regional or generational variation initially. For example, participant 1 asked for clarification over

the image for BOY. When asking if the sign was BOY, he made the sign by his torso (See figure 5.). This sign is typically done around the forehead (See figure 5.). When he gave his initial sign for BOY, he was back to signing around his forehead but as the sentences went on his sign got progressively closer and closer in location to his torso. While this was at first believed to be possible evidence of variation, but in speaking with a L2 ASL user, she revealed that from signer to signer this sign would likely be made around the torso, and that she herself as a non-native user would also sign this sign around the torso to another signer. The location around the forehead is the official form of the sign, whereas the location around the torso is the more natural.



Figure 5. BOY sign made around torso (left); BOY sign made around the forehead (right)

Due to the modality of sign language, the ability to vary is different than that of spoken languages. Spoken languages are constrained to certain types of variation depending upon the ability of the speaker to produce specific sounds. If a sound system and sign system have a greater and greater number of meaningless elements become meaningful, eventually the differences between those elements will be so minute that the differences will become indistinguishable (Aronoff, 2017). However, the manual modality in space of sign languages allows for a greater number of meaningless elements to become meaningful without becoming indistinguishable between each other. Several of the signs given throughout the study varied in seemingly significant ways without changing the sign entirely and the sign could still be

completely understood. This evidence argues for the existence of core and reducible features of sign language. In other words, signs can have variability if core aspects of the sign are not changed in a way that will change the meaning of the sign. In spoken languages, reducible features are demonstrated with hypoarticulation of sounds and reduced movement (Browman & Goldstein, 1986). Spoken languages only have the space the space provided by the mouth and nasal system to produce sounds, which is a much smaller space compared to signed languages. For signed languages, there is evidence that the core and reducible features of the signs being differentiated depends upon the complexity of the handshape and the movement. It is hypothesized that sign languages have different ranges of variability due to the amount of space available to them in the signing space of an individual. This variability can be seen throughout the features examined in the data.

The S handshape (See Figure 6.) is a feature of a sign that does not allow for much variability. The fingers are all curled into a fist and if one of those fingers varies then the entire sign is changed. For example, if the thumb in the S handshape shifts to the side then it has become an A handshape, and if the thumb shifts below the fingers then it has become the E handshape. All the features associated with the S handshape are core features of this sign and thus cannot vary by any significant degree. The F handshape (See Figure 6.) on the other hand has many more opportunities to demonstrate variability. Unlike the S handshape, the F handshape has a greater number of meaningless elements that come together to create this sign. The features of this sign include spread middle, ring and pinkie fingers, with the pointer finger and thumb forming a circle with the tips touching. This greater number of features allows for a greater amount of variability to occur. In the sign for CAT for example, (See Figure 3.) the F handshape is done in a variety of ways which all demonstrate the same meaning without being a

lexical difference. The sign for CAT has the ability to vary to the S handshape because of its similar elements to the F handshape where the middle finger and thumb come together rather than the pointer finger and thumb (See Figure 3.). In this case, the feature of pointer finger and thumb contact is reducible. However, the handshape was also capable of changing completely as mentioned in the previous section when the fingers of the F handshape dropped completely but the movement and location associated with the sign was the same. For another participant, the handshape and location remained the same, but the movement associated with this sign was not used. This is evidence for a complicated system of allowing reducible features. Perhaps if the handshape varies, then the movement and location need to stay the same, but if the movement changes then the location and handshape must stay the same. This sign demonstrates multiple examples of reducible pieces of sign and a more complicated communication system (Hockett 1960; cited by Aronoff 2007). While this variability may also be evidence for a sign accent, none of the other signers, including the other participant in the category of older generations of signers, gave this form, and so no conclusive conclusion can be made.



Figure 6. S handshape (left); F handshape (right)

Beyond evidence of core and reducible features, this study has also demonstrated further evidence of variability due to iconicity in ASL. Sign language, as a visual language, has a greater ability to communicate and replicate the visual aspects of the world around us. In other words,

iconicity demonstrates that there is a greater range in how things can be signed than what had been previously believed. Due to the amount of resources available in manual modality vs. sound modality, the amount of variability in visual languages is greater. This type of variability may be not be accents but instead a reflection of the world around certain individuals. There could be any number of ways of creating variability from iconicity. One example of variability demonstrated through iconicity is the sign for FORK. The first two participants (one from the younger generation and one from the older) signed FORK in the expected manner (See Figure 7.) whereas participant 3 signed FORK with some variation (See Figure 7.). This variation seems to demonstrate some iconicity as the usual sign for FORK includes the use of two fingers as the prongs, but participant 3 uses a sign with three fingers. This sign may simply reflect a closer resemblance to forks visually, thus allowing for the variation. The movement and general location associated with the sign was completely the same.

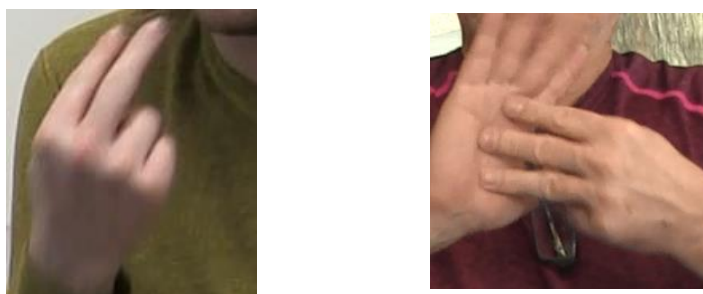


Figure 7. FORK expected sign (left); FORK more iconic sign (right)

As was expected, the signs with the greatest amount of variation was signs with complex movements. For example, some signs like SCISSORS, are used in space to describe the purpose in the sentence/story. If a signer is describing an event like cutting a piece of paper the sign for SCISSORS would act out this action. This made coding and data collection difficult as none of the participants were given prompts to discuss, and so their action signs were all

different, thus preventing an analysis of variation with these signs. Location featured signs was another element that was difficult to determine the level of variation. As was previously mentioned, the use of natural language or non-natural language was difficult to determine, and it appeared that features associated with location were the most likely to be natural. This may be due to the lazy or quick nature of natural speech. When a signer signs naturally, they are more likely to make the sign as quickly as possible and so they are less likely to put the effort into moving their hand from their torso, a neutral location, to the forehead, an out of the way location. This made determining the variation associated with the feature of location difficult to determine, especially as many of the signs were in the general locations of their expected location feature (i.e., forehead, mouth, chin, torso). It is recommended that future studies look at the minute differences between variations in locations, especially as signs made around the head have demonstrated evidence of needing to be more precise, such as in signs for APPLE and ONION, which are minimal pairs with only a difference in location being the differentiating factor. But signs made around the torso appear to be more neutral and sporadic perhaps due to the greater amount of signing space.

Most of the data as pointed toward the possibility that the effort to create precise features differs between spoken and signed languages. In speech, the mass of articulators is less and the effort is relatively minimal for a native speaker. For example, the distance between places of articulation are smaller in the mouth than they are in the signing space. Most of the effort to produce sounds in speech is precision effort (Browman & Goldstein, 1986). In sign languages, the articulators are larger and require more effort to not only move but in precision as well (Napoli & Sanders, 2014). In speech reducing behaviors are common but it appears that this behavior is common in sign to a greater degree. There is a significant amount of reduction in

effort but at the same time, because the signing space is larger, the demands on precision are lower.

At the end of each study session, participants were asked to answer a few follow-up questions to determine their own experiences and thoughts on sign language accents (See Appendix A). When asked whether there were other variations of the same signs, all three participants gave lexical variations for a few of the signs. This correlates back to the vast lexical differences in sign that exist just as in spoken language. Participant 1 could not think of anything that made Pittsburgh signing unique, but he did believe that he probably has an accent to other signers from other areas. This participant has moved around parts of the U.S. and he identified that it was possible to tell whether someone was from the Northeast, the Midwest, or the South and he identified those as regional variations. However, he had never thought about those differences and he could not give any specific examples. This is further evidence of the complicated nature of sign language variation. It is an accepted fact that there are differences between regional and generational variations of ASL, but it has been difficult to classify and describe.

Participant 3 recognized that Philadelphia has a unique sign that is different from other places and he stated that he could not understand some of their signing, but he could not explain it beyond that. He believes that he has an accent. When this participant was asked about whether or not Pittsburgh sign is unique, he said that when he was growing up and learning ASL in the Pittsburgh area, he learned that the signs for the days of the week (MONDAY, TUESDAY, WEDNESDAY, etc.,) were signed by completely touching the dominant hand doing the sign to the cheek with a tap movement instead of the sign being done in neutral space with a circular movement (See Figure 8.). However, today he uses the more universal signs for the days of the

week (See Figure 9.). These signs demonstrate variation in numerous ways, but they also show possible aspects of the sign which are core features, and which cannot be changed. Each of the signs demonstrated the same handshape for each day of the week. An M handshape for MONDAY, a T handshape for TUESDAY, a W handshape for WEDNESDAY, etc., but the movement and location were vastly different. It is unknown whether a signer from another area, or a younger generation, would understand these signs, but all the same, these examples have some evidence for core and reducible features of signs.

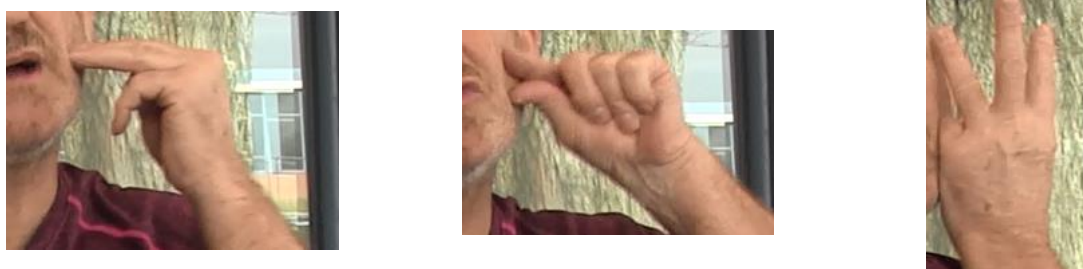


Figure 8. Days of the week variation signs; Monday (left), Tuesday (middle), Wednesday (right)

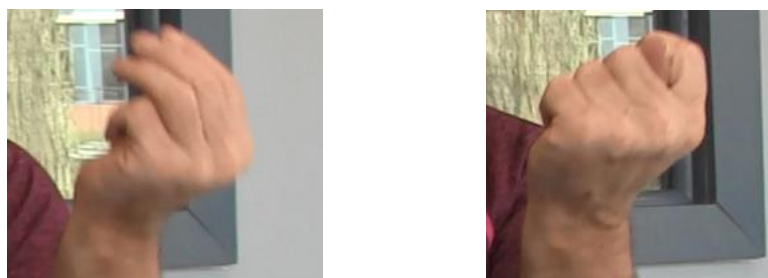


Figure 9. Days of the week expected signs; Monday (left), Tuesday (right)

While the initially intention of this study was to discover evidence of a generational sign accent in the Deaf community of Pittsburgh, this study did succeed in discovering evidence of linguistic variation in ASL which can further the research in this field. The number of participants has been an issue with many of the studies done on this topic; including this study

which had three participants. To obtain conclusive evidence of regional and generational differences between signers, studies with larger numbers of participants will need to be added to the current literature.

Another obstacle that a study of this nature must contend with is the intrinsic qualities of the Deaf community. Many of the Deaf communities around the world are tightly-knit groups of individuals. While this does lead to interesting questions about how the culture and society of the Deaf community influences the native language of its users, this does lead to some difficulties in collecting data. The main investigators in this project are hearing individuals who are not a part of the Deaf community in any capacity. All the participants were contacted because of connections. This adds some confounds to this investigation, as the participants may not have spoken as naturally as they would have amongst other signers from the Deaf community. As was mentioned in the previous section, the participants did demonstrate evidence of signing in a natural manner, but the extent of the natural data gathered is unknown.

Chapter 5

Conclusion

Overall, the data obtained has demonstrated various types of variation in American Sign Language. There is also evidence for core and reducible features of signs which create variability. The reasons for why an individual will choose to switch between these features is perhaps further evidence of a sign accent, but this hypothesis is inconclusive. As previous literature and this study have demonstrated, the iconicity of sign language does allow for a greater range of variability but the reasons for why each a signer would choose a more iconic sign may pertain to their environment or it could be attributed to a sign accent, but again, there is no conclusive evidence. This study has demonstrated that the field of sign language phonology is a continuously complex topic to delve into. The range of variability between signs and signers has proven that there yet remains aspects of sign languages that could teach the linguistic community about the languages communities around the world use today. While no evidence of a unique Pittsburgh sign was obtained, such as in Philadelphia, this study is one step further in determining the level of linguistic variability in American Sign Language.

Appendix A

Questionnaire

1. From the list of signs were there any that has different variations of signs?
2. Who uses different variations of these signs?
 3. Do you use them?
4. Is there anything unique about Pittsburgh sign?
5. Is Pittsburgh sign different from other places?
6. Do you think you have an accent?

Background Information

1. How old are you?
2. When did you learn ASL?
3. Who else do you know that uses ASL?
4. Are your parents hearing, deaf or hard of hearing?
5. What is your English reading proficiency on a scale of 1-10 (with 10 being fluent in reading English)
6. What age did you learn English?
7. Which is your stronger language; English or ASL?
8. Which language did you learn first?
9. Did you go to a deaf school?
10. Did you grow up in Pittsburgh?
11. Have you ever lived anywhere else? If yes, where?

Appendix B

Expected Features

Order	Sign	Handshape	Expected Feature
1	DOOR	B : B	HS_Bt
2	BUTTERFLY	OB : OB	HS_OBt
3	FOX	F	HS_Fpt AMT-T
4	APPLE	X	LT_check→CT
5	CAKE	sC	Move_touch palm then upward
6	BABY	OB : OB	HS_OBt
7	TRUCK	T : T	Move_Dom T o-t-o NonDom T w/ double tap
8	FISH	OB	HS_OBt
9	CANDY	Fist w/ p extended	Move_twist
10	FORK	V	HS_V p&m distance
11	BOAT	OB : OB	HS_OBt
12	HAT	X/A	HS_X/Ap
13	CHICKEN	G	LT_p & t
14	PEAR	flat O	Move_Nondom flat O, Dom pull over flat O x2
15	WINDOW	OB : OB	HS_OBt
16	FLOOR	B : B	HS_Bt
17	CANOE	S : S	LT_fist o-t-o fist→CT
18	EGG	closed V	HS_p&m completeley closed
19	TOILET	T	HS_Tt
20	ELEPHANT	OB	HS_OBt
21	DRESS	sOB	LT_chest→CT
22	SPOON	H : OB	HS_H : OB
23	BOTTLE	C : B	Move_pull Dom C upwards in bottle shape
24	ONION	X	LT_temple→CT
25	BIRD	G	LT_mouth→CT
26	BOY	flat O	LT_forehead→NT
27	CAT	F	Move_tap w/pull out
28	BUTTER	H : OB	HS_H : OB
29	DONUT	D : D	Move_make circle with each D has half the circle
30	ICE CREAM	S	HS_St
31	CAR	S : S	HS_St

32	PAPER	OB : OB	HS_OBt
33	CRACKERS	A	LT_elbow→CT
34	KNIFE	H : H	HS_p&m completeley closed
35	SCISSORS	V	Move_p&m come together direction across chest
36	SANDWHICH	cOB : cOB	HS_OBt
37	BOOK	OB : OB	HS_OBt
38	FRUIT	F	LT_mouth corner→CT
39	TRAIN	H : H	Move_slide dom o-t-o Nondom x2
40	CHEESE	sOB : sOB	HS_fingers

Appendix C

Coding Key

IS	Initial Sign
S1	Sentence 1
S2	Sentence 2
S3	Sentence 3
Dom	Dominant hand
NonDom	Non-dominant hand
HS	Handshape
B	B handshape
Bt	B thumb – pressed against palm
OB	Open B handshape
OBt	Open B thumb – spread out to side
ct	Curved thumb
F	F handshape
Fpt	F pointer finger and thumb tips touching in a circle
X	X handshape
AMT-T	Amount touching – expected feature
LT	Location touching
CT	Complete touch
PT	Partial touch
NT	No touch
sC	Spread C handshape – fingers are spread out while holding C handshape
Move	Movement
o-t-o	On top of
NS	Neutral Space
Ex	Expected
m	Middle finger
p	Pointer finger

BIBLIOGRAPHY

- Crasborn, O., H. van der Hulst, and E. van de Kooij. "Phonetic and Phonological Distinctions in Sign Languages." *Holland Institute of Generative Linguistics*, January 28, 2000. Available at <http://www.sign-lang.uni-hamburg.de/intersign/internal/vdhulst2.pdf>
- Emmorey, Karen. *Language, Cognition, and the Brain: Insights from Sign Language Research*. Lawrence Erlbaum Associates, 2002.
- Fisher, J. N., Hochgesang, J. A., & Tamminga, M. (2016). Examining Variation in the Absence of a 'Main' ASL Corpus: The Case of the Philadelphia Signs Project. *LREC - 7th Workshop on the Representation and Processing of Sign Languages: Corpus Mining*, (may), 75–80.
- Frishberg, N. (1975). Arbitrariness and Iconicity: Historical Change in American Sign Language. *Language*, 51(3), 696-719. doi:10.2307/412894
- Gerrig, R., & Rastle, K. (2019, 02). New initiatives to promote open science at the Journal of Memory and Language. *Journal of Memory and Language*, 104, 126-127. doi:10.1016/j.jml.2018.10.004
- Goldin-Meadow, S., & Brentari, D. (2015). Gesture, sign and language: The coming of age of sign language and gesture studies. *Behavioral and Brain Sciences*, 1–82. <https://doi.org/10.1017/S0140525X15001247>
- Linguistics, Gallaudet University. (2017, September 16). Do sign languages have accents? Retrieved from <https://www.youtube.com/watch?v=Gli3akhYOSo&t=70s>
- Lucas, C., Bayley, R., Rose, M., & Wulf, A. (2002). Location Variation in American Sign Language. *Sign Language Studies*, 2(4), 407–440. <https://doi.org/10.1353/sls.2002.0020>
- Napoli, D. J. & Sanders, N. & Wright, R. (2014). On the linguistic effects of articulatory ease,

with a focus on sign languages. *Language* 90(2), Linguistic Society of America. Retrieved March 29, 2019, from Project MUSE database.

“Phonology.” *SIL Glossary of Linguistic Terms*, 24 Apr.

2017, www.glossary.sil.org/term/phonology

Sandler, W. (2017). The Challenge of Sign Language Phonology. *Annual Review of*

Linguistics, 3(1), 43–63. <https://doi.org/10.1146/annurev-linguistics-011516-034122>

Valli, Clayton, and Ceil Lucas. *Linguistics of American Sign Language: an Introduction*.

Gallaudet University Press, 2011.

ACADEMIC VITA

Maria C. Fleck

(724)714-9489 | mariacfleck23@gmail.com

EDUCATION

The Pennsylvania State University – University Park, PA Graduation May 2019

- Bachelor of Arts in Letters, Arts, and Sciences
-Focus in Linguistics
- Bachelor of Arts in French and Francophone Studies
-Focus in French Culture
- Minor in Psychology

Schreyer Honors College

Paterno Fellows Program, College of the Liberal Arts

- Honors Program including advanced academic coursework, thesis, study abroad and/or internship, ethics study, and leadership/service commitment.

Study Abroad Experience:

Centre de Linguistique Appliquée – Besançon, France Summer 2017
-DELF level B2 language competency diploma

Embedded Program FR197: France and the Holocaust March 2019
-Week abroad in Paris, France learning about the Shoah with hands on experience.

LEADERSHIP EXPERIENCE

Liberal Arts Envoys – University Park, PA 2015-Present

Co-President 2018-Present

- Representing the College of the Liberal Arts as a student ambassador at prospective student, alumni, and college events
- Plan and lead 16 general body and executive meetings per semester during duration of term
- Coordinate the internal aspects of the organization
- Lead public speaker at Liberal Arts events

Vice President 2017-2018

- Participating in and setting up events within the College of Liberal Arts
- Scheduling and Promoting events within the College

Tetra, Penn State IFC/Panhellenic Dance Marathon (THON) Organization 2015-Present

Outreach Director 2017-Present

- Organizing events that pertain to spreading awareness for the mission of THON
- Directing drives for Be The Match and Red Cross
- Collaborating with other THON organizations
- Raised \$5,000 for THON mission with over \$40,000 raised overall by membership each year.

Liberal Arts Alumni Board of Directors – University Park, PA 2017-Present

Student Representative

- Attending biannual board meetings and teleconferences
- Keeping the board members up to date on events in the College from a student leader perspective
- Promoting events in the College
- Representing the college at various functions

Dept. of French and Francophone Studies Study Abroad Peer Mentor – University Park, PA 2018-2019

- Sharing experiences and information for underclassmen within the French Dept.

SKILLS

Public Speaking, Upper Intermediate French language proficiency, Beginner in American Sign Language

AWARDS

2019 French and Francophone Studies Student Marshal, Achieved Dean's List – all semesters, Class of 1922 Memorial Scholarship