Historical Changes in Sign Language - a Comparison of Spoken and Sign Language Change
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Introduction

0.0 Background All spoken languages change, a fact that a native speaker of English easily notes when reading the English Chaucer used in Canterbury Tales and Shakespeare used in “Macbeth,” each in his respective day. The English used is quite different and often unintelligible to a native speaker of modern day English. Linguists have shown through countless studies that spoken languages around the world, not just English, change semantically, syntactically, morphologically, and phonologically. New words are created, other words are borrowed, and still others are deleted. In studying these changes in spoken languages, historical linguists have used a number of different tools to analyze the changes that occur in the spoken languages. Linguists may study change by comparing a number of genetically related languages at a certain time, by comparing the differences in these related languages, and by drawing conclusions from the relatedness of these compared languages. This method of analysis, called the comparative method, uses a number of languages to compare two or more different points in time, diachronic analyses, or uses a number of languages at a particular time, synchronic analysis. Historical linguists also study change by observing specific changes over time in a single language and analyzing the variation, a method known as internal reconstruction (Margutti 1982: 2).

To this point I have discussed historical changes in spoken languages. What about sign languages? Until recently, little was known about sign languages in linguistic terms because sign languages were not accepted as “real” languages but rather considered gesture systems the Deaf community use to communicate. However, with a bombardment of research on sign languages by linguists over the last 30 years, it has been shown that sign languages, like spoken languages, are real. Sign languages, therefore, have most of the properties that spoken languages have in terms of

1 I would like to thank the following people for there help throughout the writing of this paper: Amber Frank and Ellen Johnson for their useful critique of my rough drafts, Donna Jo Napoli for her guidance with my original study and her time helping with final revisions, and Ted Fernald for his direction, useful discussion and quality comments. I would also like to thank my mom for the timely arrival of her cookies. Note: all thoughts and arguments are my own and therefore any that may be questionable are my responsibility.
linguistic principles. Sign languages have a distinct phonology, syntax, semantics, and morphology, thus illustrating that sign languages are not simply a gesture system, but a language system (Battison 1978:6-7).

Though spoken and sign languages have similarities, mainly the overarching linguistic principles, sign and spoken languages are clearly different. Most noticeable is that sign language incorporates hands into the phonological system and is perceived for the most part with the visual system whereas spoken languages are created through the oral cavity and perceived through the auditory system. Second, because sign languages use the visual system, the phonological system of sign languages is quite different. Spoken languages have a sequential arrangement of elements, whereas sign languages have more simultaneous combination of units. The phonological units of sign languages are thus produced together rather than in sequence, although some signs in ASL, especially compound signs, are arranged more sequentially (Bellugi et al. 1972:175). A third difference is the influence of the surrounding spoken languages on sign language. Finally, speakers of a sign language are often introduced to sign language later than a speaking child is introduced to a spoken language because a deaf child is often raised in a hearing environment. I will discuss these further when looking at change in spoken versus sign language.

With these similarities and differences in mind, I will return to my original question, do sign languages change? An even better question to ask is: do sign languages change in the same manner that spoken languages change, or are these differences, mentioned above, enough to alter the language change in sign languages? If sign languages are similar to spoken languages, then hypothetically they should progress through natural historical changes similar to spoken languages. However, because of the differences in mechanisms by which sign languages are made and the environments in which sign languages are used, the historical changes may need to be analyzed and discussed differently, thus different questions need to be asked and different theories developed for

2 Deaf people who are also blind feel a signer's hands to receive information (personal communication Napoli 1998)
sign languages.

In this paper I discuss current theories of historical changes in sign languages and argue that only on a basic level can change in the two language systems be compared. With the support of various documents over the last 20 years, I begin by arguing that historical change does occur in sign languages (Part I). Frishberg, the first to study historical changes extensively in ASL and extensively compile earlier work on historical changes in ASL, demonstrates that sign languages have changed significantly over the last two hundred years (Frishberg 1975, 1976, 1980). However, more recent work has challenged Frishberg’s analysis, questioning the methods by which the study was performed. For example, Margutti, in her MA thesis, questions Frishberg’s method of analysis (Margutti 1982). I discuss these conflicting views in change and then argue that change does occur in sign languages and that the changes that Frishberg observes in her studies do occur. I also examine the principles of historical change in terms of spoken languages. In this comparison I will argue that fundamental features of change (assimilation, deletion, ease of perception and movement toward fluidity) occur in both languages. However, other than these underlying similarities, certain changes seen in spoken language are not observed in sign languages due to the differences between spoken and written languages. 3

0.1 Misconceptions about Sign Languages - To the unknowing population, and even to native speakers of ASL, there are a number of misconceptions about sign language I will address in order to show that like a spoken language, sign languages are real. These misconceptions, which I discuss and then discount in the following section, are the following: 1. sign languages are universal, 2. sign languages are a one to one coding based on the surrounding spoken language, 3.

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3 The data that most of these articles use when describing historical change in sign language can be seen as problematic. For example, in spoken languages, plenty of data has been compiled, thus historical changes have been well documented. Because there is no written system for sign languages, data is hard to find and the validity of the data is often questioned - as I will later discuss with Margutti’s thesis. I propose a study at the end of this thesis which I hope will increase the amount of data on historical change in sign languages, thus providing linguists a better picture of historical change in sign language.
sign languages are iconic in nature, thus being a pantomimed gesture system, and 4. sign languages are restricted in content and expression. By understanding and clarifying these ideas, we may better understand the underlying principles of sign language and thus the changes in sign languages.

To the unknowing viewer, sign languages around the world seem to be universal, thus one might think that all people who use sign language can understand one another. This suggestion, however, is not correct. A signer of British Sign Language (BSL) cannot understand a signer of American Sign Language and visa versa. This fact is interesting because both BSL and ASL share a common written language (Battison 1978:3). Similarly, even though French Sign Language (FSL) and ASL share a common origin in Old French Sign Language (see discussion below), signers cannot understand one another. In an extensive study by Battison and Jordan in 1976, comparing sign languages around the world, these linguists demonstrated that signers from 17 different sign languages around the world could not understand one another (cited in Battison 1978:4). Like spoken languages, signers in different areas do not speak the same language.

A second misconception about sign languages is that sign languages are sign for word representations of the spoken language of the surrounding speaking community. For example, some unknowing observers have claimed that ASL is a direct translation of English. In other words, a speaker of sign language signs the exact same words as a speaker of the surrounding spoken language. If this were true, ASL would need words for “a,” “the,” and “an,” along with countless of other words, which ASL does not have. It is true that a spoken language can be signed, sign for word, using finger-spelling. However, signing communities do not communicate with one another through such a system - this type of communication is slow and cumbersome, thus not a practical means of communication. ASL also has its own syntax, semantics, and morphology. There is some relation between ASL and English due to a shared written language and there is borrowing of English words and letters into ASL due to the two languages close proximity. This is a point I will review later when discussing lexical borrowing within sign languages. However, a sign language is a distinct language outside of the spoken language used in the surrounding areas
and is thus not a direct translation of the surrounding spoken language (Battison 1978:4-5).

Another myth about sign languages is that sign languages are made of pantomimed gestures. The argument suggests that sign language speakers simply use hand gestures and body movements strung together in a nonsystematic manner to convey a message, and that signs are not made up of arbitrary units similar to the units in the phonology of spoken languages. However, many studies have shown that sign language is a language like any spoken language, and the phonology is thus composed of arbitrary segments - it has other features like syntax and semantics. First, Bellugi and Siple showed in short-term memory experiments that storage of certain phonological features of ASL are stored and processed similarly to features of spoken languages (in Battison 1978:6). Words within a sign language have distinct units, phonological units if you will, in which each sign can be described (see phonology of sign languages below). Secondly, sign languages have a distinct syntax - certain sentences are ungrammatical under the laws of grammar for that particular sign language. Finally, sign languages often change from more iconic to arbitrary, a topic which I will discuss throughout the rest of this paper. Together these points illustrate that sign languages are not simply gesture systems (Battison 1978:7).  

Finally, some claim that sign languages, unlike spoken languages, are restricted in their range of expression, thus sign languages “are impoverished lexically and grammatically, and deal better with concrete and emotive matters than abstract propositions” (Battison 1978:8). In some ways, the lexicon of ASL is impoverished, but Battison suggests that this results from a lack of standard use until recent times. Those areas which have shown tolerance to ASL, sports and the printing trade, have a very enriched lexicon. In relation to restricted range of expression, sign languages have no less expressive freedom than do spoken languages (Battison 1978).

By reviewing these common misconceptions of sign languages, I show that the features of

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4 Though I have discussed that sign languages are made up of arbitrary units like spoken languages, there is an underlying iconic nature to sign language - an element of truth in the observation that sign languages are pantomimed gestures. For example, many signs are introduced into sign language on the basis of the picture they make and change as to ease articulation.
sign language make it similar to spoken language, although not completely the same. As I mentioned before, sign languages do have a distinct phonology, morphology, semantics, and syntax. Furthermore, like spoken languages, sign languages around the world are different from one another. Because we understand that sign languages have these features, we can discuss the changes in sign languages, discuss the theories which linguists have proposed for the changes in sign languages, and ponder these changes in relation to the changes observed in spoken languages.

0.2 Basic "Phonology" of Sign Language - The most well studied historical changes in sign language are changes in the phonology of sign language. Similarly, in spoken languages, changes in phonology are often the easiest to observe and thus best documented (Lehmann 1962 in Margutti 1982:2). It has been shown that sign languages also progress through syntactic changes. For example, Frisher suggests that the word order in ASL has changed from SOV to OSV to SVO (1975). However, because most of the research has been done on phonological changes in sign languages, because phonological changes are the easiest to observe change, and because the phonology of ASL, like spoken languages, trends to show the most change, I will focus the rest of the paper on phonological changes in sign languages. However, before discussing the changes in the phonology of sign languages, I must review the phonology of sign languages.

As Stokoe first described in the early and mid 1960's, there are basic features that describe the phonology of sign languages. Stokoe describes three of these features: hand configuration, place of articulation, and movement also known as the dez, tab, and sig respectively. Woodward later discusses orientation of the hand as a fourth feature in describing the articulatory parameters of sign languages (Woodward 1973).

0.2.1 Hand configuration - Hand configuration, the first of the phonological features, describes the shape of the hand, dez, used during a sign. Figure 1 shows the possible hand configurations in ASL (Note that there are hand shapes other than numbers and letters from the ASL alphabet). Not all possible hand configurations are used. For example, there are sixteen possible combinations of hand shapes that can be made by simply extending different fingers. In ASL only ten of the
possible combinations are used in signing environments. However, Chinese Sign Language contains the hand shape in which the ring finger is extended, whereas ASL does not include this hand shape. Not all hand configurations are used in all sign languages, thus making a comparison to the fact that not all sounds that are possible occur in all spoken languages (Friedman 1977:13-15).

0.22 Movement - The second phonological articulatory feature in sign language is that of movement, tab. Stokoe describes movement parameters in the following way: upward movement, downward movement, up and down movement, rightward movement ... etc. Friedman, in a more recent article, discusses movement in more abstract features. He claims the movement of a sign can be classified under the following features:

1. Interaction of hands - Which, if not both, of the hands are articulators? Do they both have the same movement and do the hands interact with another during the movement?

2. Contact of hands - Does the articulator, the fundamental aspect of the sign, make contact with the body during the production of the sign?

3. Direction of hands - What is the direction of the hands within the movement - in terms of spatial axes, verticals, horizontal-width and horizontal-depth?

4. Manner of hands - What is the manner of the hands? Is there movement of the arm or wrist in any direction?

Together, the movement of a particular sign can be described using these features (Friedman 1977:27-34).

0.23 Place of Articulation - Place of articulation is the third parameter of sign language. This feature is difficult to analyze in a discrete manner, because unlike spoken languages, quite a large area can be used in the place of articulation. The basic space that a sign is located in is a rectangle in front of the body and one located in front of the head (figure 2). There are times, however, when a sign may be made outside the signing space to convey some message. These signs outside the normal signing space are usually signs for extremes. There do seem to be four major areas of articulation within the articulatory space: the head and neck, the trunk, the arm, and the hand
Orientation of the Hand - The final phonological feature of sign language is orientation of the hand to the body during the sign. The orientation may change depending on the shape of the hand during the sign. On the simplest level, the orientation of the hand can be considered up, down, left, right, toward and away from the body. However, for some hand shapes, these six orientations do not sufficiently explain the orientation (Friedman 1977:43).

Summary - Together, these four articulatory parameters combine in various combinations to form the phonetic description for most signs, similar to the basic features of spoken languages being placed together to form sounds, and thus words. These phonological units described above can therefore be used to distinguish signs from one another. Similar to spoken language, sets of words in sign language can be seen as minimal pairs. In spoken language, an example of a minimal pair would be [k t] versus [s t]. Only one of the phonological units is different in these two words. In ASL, a similar principle can be used. For example, APPLE and CANDY (figure 3a) have the same motion, orientation, and place of articulation, only the handshape is different; SOUR and CHINESE (figure 3b) differ only in place of articulation. Similarly NAME and SHORT (figure 3c) show only a difference in movement; and NAME and SIT (figure 3d) have only a different handshape (Battison 1978:23).

These finite arbitrary elements do illustrate some similarity between sign languages and spoken languages. However, unlike spoken languages, Friedman claims that there are certain features of sign languages, which cannot be completely described with the four sub-lexical (phonological) features outlined in the section above. Friedman says, “It is important to remember in a discussion of the phonology of sign language, that manual/visual language in many ways is not entirely comparable or analogous to oral/auditory language with respect to both structural advantages and deficiencies” (Friedman 1975:55). However, as we will see, it is often the case that over the years, many of the signs lose the more iconic features and develop many of the distinct classifications discussed above.
PART I

1.0 Do sign languages change? Now that misconceptions about ASL and sign languages and the phonology of ASL have been discussed, I will review some of the theories of change in ASL—discuss if ASL proceeds through historical changes. In the following sections, I discuss Frishberg’s and Woodward’s analysis of phonological change in ASL. I then review a paper presented by Margutti which suggests that these changes that Frishberg discusses are not historical changes, but rather changes in register. After mapping out Margutti’s argument, I will argue that Margutti’s study has a number of flaws and that the changes that Frishberg observes do occur on some level in ASL and other sign languages. Using further work by linguists in other sign languages; in other sign language dialects, and in studies of signers of different ages, I will further illustrate that sign languages do change. By showing that sign languages change and discussing the nature of these changes, I can compare change in sign languages to change in spoken languages (PART 2).

1.1 Change is ASL - As I stated earlier, Nancy Frishberg’s 1975 paper, "Arbitrariness and Iconicity: Historical change in American Sign Language," is one of the earliest and most well known studies of historical change in American Sign Language. Most of Frishberg’s research is based on a comparison of French signs from the 20th century, a sign language manual published by J. Schuyler Long in 1918 and current documents and videotapes. By contrasting the signs and the descriptions of the signs from the various OFLS texts and Longs’ ASL manual, Frishberg was

5 I am assuming that the basic features described in the above section "work" for all sign languages.

6 American Sign Language is thought to have been originally introduced into the United States by Thomas Gallaudet after he traveled to France and began the American Asylum in Hartford, Connecticut. Gallaudet met with Abbe Sicard in London and learned how to instruct the Deaf and learned many signs by studying French Sign Language. These two used the French signing system as a basis for American Sign Language (Frishberg 1975). The sign language that developed at this time in the United States also had elements of a sign language which was present in Hartford at the time of their arrival (personal communication Napoli 1998). This may be one of the reasons that ASL has changed so rapidly from Old FSL.
able to observe changes in the phonology of ASL over the last 100+ years. From her observations and the observations of some previous studies, she claims there are five changes that frequently occur in ASL: movement toward symmetry, displacement, assimilation (fluidity), morphological preservation, and concentration of lexical information in the hands (Frishberg 1975). In a study of regional differences in certain signs, Woodward later suggests a few other phonological changes that have occurred in ASL: "rule of thumb", elbow-to-hand shift, and naturalization of signing space (Woodward 1975). In the following section I discuss these changes. I will also support the idea of historical phonological changes in light of recent research in other sign languages and other sign language dialects.

1.1.1 Symmetry - Symmetry is the process by which two handed signs that use different hand shapes, change to a sign with the same hand shape or movement. For example, the sign LAST/FINAL was originally cited in Long's dictionary as having the index finger moving and striking the little finger, but today, both hands use the little finger (figure 4a). Similarly, the sign DEPEND, as cited in Long's dictionary, was made by the index finger resting on the an open hand, palm forward. The hand shape has been replaced by the index finger, thus both hands using the same hand shape. A third example of symmetry has occurred in the sign for WORLD, in which a signer now uses the W hand shape for both the dominant and non-dominant hands (figure 4b) (Frishberg 1975:700-701).

The process of movement toward symmetry also encompasses the change of one handed signs to two handed signs in which the "picked-up" hand makes the same motion and has the same hand shape as the original hand. For example, ANGRY, DIE, HURRY, and TRAVEL were originally one handed signs that have added a second hand; the second hand has the same hand shape and movement as the original signing hand (figure 4c illustrates the change in ANGRY). Frishberg suggests that the symmetry "facilitates articulation by allowing the signer to program both hands at once" (Frishberg 1975:701). The second hand becoming symmetrical allows the perception of the sign to be easier, a point I will discuss further when reviewing another
phonological change, displacement (Frishberg 1975:700-701).

1.12 Displacement - According to Frishberg, another natural phonological change in ASL is displacement. Displacement can be discussed in relation to the two signing spaces, the body and the face. In general, signs made below the neck tend to become more centralized. On the other hand, signs made in contact with the face tend to move away from the center and out toward the periphery. PICKLE, in Long's 1918 dictionary, was made at the corner of the mouth. The sign is currently made on the corner of the chin. NOTHING, DENY, and WRONG, which were all made on the upper lip in OFSL are currently made below the chin. Furthermore, two handed signs made in contact with the face tend to become one handed. For example, in Long's 1918 sign dictionary, CAT, CHINA, DEVIL, HORSE, RAT, and MOUSE, were all made with two hands. As discussed above, displacement also includes one handed signs located below the neck becoming two handed. In relation to the displacement of waist level signs, AMBITIOUS, BLUSH, AND SHIP, which are all chest level signs, have added a second hand (Frishberg 1975:703-707).

Frishberg suggests that reasoning for the displacement of the signs was a result of the relationship between visual acuity and sign perception. When signing, signers look at one another's faces. Frishberg suggests that the signs made at the face do not need to be two handed because the signs are in close proximity to the receiver's vision. In contrast, the redundancy of the sign below the waist, thus the reason why many signs add a second hand, allows the viewer to view the sign more clearly without changing his or her field of vision. Similarly, the redundancy of the signs, suggested by Frishberg, "is crucial in a linguistic system, ... the more you know about a segment in English, the more we can predict about the following or proceeding segment" (1975:706).

Furthermore, opening up the face area by removing one hand and moving the hand outward allows grammatical features, often found at the face, to be exposed (Frishberg 1975:706-707).

1.13 Assimilation/Fluidity - The third phonological change discussed by Frishberg is assimilation. Signs tend to become smoother in motion and to assimilate hand shapes or orientations of the components of the signs, especially in compound signs. Compound signs, signs composed of two
different signs, often become smoother, and the various phonological segments of the sign become assimilated. For example, INFORM was historically made by combining one handed KNOW with two handed BRING. In the modern day form of the sign, KNOW and BRING have been combined into a sign in which the dominant hand begins at the forehead and non-dominant hand is at waist level. The dominant hand moves away from the head and the hand opens. The non-dominant hand moves slightly outward and also opens (figure 5a). One the best documented cases of assimilation in a compound sign is that for TOMATO, which once was signed by combining RED and SLICE. The sign currently maintains the RED hand shape throughout the entire sign, and the sign has changed to a more fluid sign (figure 5b) (Frishberg 1975:707).

Further example of assimilated signs are those which have lost either the first or second feature because the original signs were difficult to make. For example, the original sign for SPRING contained SUMMER and GROW; the current sign is now similar to GROW (GROW is made by a single opening, upward movement whereas SPRING has a double upward movement). Thus the SUMMER sign has been lost, and the second sign has been slightly modified. One of the best examples of the assimilatory process in American Sign Language is for the word HOME. HOME was originally made by combining EAT and BED. However, the sign has been assimilated to a structure similar to both signs - the flat O hand shape is used in both signs and the placement of EAT has moved outward from the mouth.

Together, these examples illustrate how certain signs move toward a more fluid and often more easily articulated sign. Interestingly the assimilation of the two hand shapes or movements in a compound sign convey to the viewer that a compound sign is being made and thus the viewer can note that the signer is using only one lexical item (Frishberg 1975:708-709).

1.14 Lexical Content Limited to the Hands - Another historical change discussed by Frishberg is based on the observation that lexical content becomes limited to the hands. Lexical content limited to the hands is the process by which signs that once used bodily motion are currently signed without the bodily involvement - the hand morphs aspects of the motion. Many older signs were
signed using body movement, a more pantomimic form of the signs. For example, in Long’s
dictionary, BORING was signed by pressing the forefinger against the nose and the signer bowing
his or her head. However, one currently signs BORING by moving the finger back and forth on
the side of the nose (figure 6a). In OFSL (Old French Sign Language), COMPARE was signed by
two flat hands facing each other and the eyes moving back and forth as though the signer were
comparing two objects. The current sign for COMPARE has limited the information to the
hands (figure 6b). A final example is the that for THINKING. In OFSL, THINKING had the
finger resting on the forehead and the head moving in a circular motion, whereas currently the sign
is made by the finger moving in a circular motion at the forehead (figure 6c). In all of these
examples, the movement of the body has been transferred to the hands. Thus, the signs move away
from pantomime signs toward more arbitrary signs which follow a more fluid motion (Frishberg
1975:711-714).

1.15 Morphological Preservation - The final group of phonological change discussed by Frishberg
are morphological preservation. Signs change from an iconic, pantomimed shape to a sign with
morphological features similar to that group of signs. Two examples cited by Frishberg are for the
words WILL and STEAL. STEAL has changed from a sign in which the hand makes a grasping
motion behind a stationary hand to one with a bent-V hand shape (figure 7), a hand shape which
Frishberg suggests is similar to other signs that denote offensive behavior (RASCAL,
MISCHIEVOUS, SELFISH, NEARBY, AND STRICT). Similarly, WILL has moved to the chest
from the waist. In this movement, the sign has moved closer to a theoretical “time line” that is
located from past the ears to the front of the body. Signs that denote time are located within this
time line.

These changes in morphological preservation allow signs to become more regularized.
Further the signs move from iconic in nature to more arbitrary - thus having more of the basic
phonological features discussed above. Morphological preservation "encourages the organization
of linguistic units into classes of terms manipulable on a formational level, irrespective of referents"
(Frishberg 1975:715). Like many of the other historical changes discussed by Frishberg, morphological preservation moves away from iconic toward more arbitrary signs.

1.16 "Rule of thumb" - Woodward discusses three more historical phonological changes that occur in American Sign Language. He describes these changes as "rule of thumb", elbow-to-hand shift, and naturalization of signing Space. Woodward describes the "rule of thumb" as a change in which the thumb becomes extended for certain hand shapes. The "rule of thumb" has been observed mostly to occur in the G and H hand shapes. In modern ASL, signs that contain either the G or H hand shape often have extended thumbs, whereas earlier forms of the signs did not extend the thumb. It has also been observed that many Southern signers extend the thumb on signs using the R hand shape, suggesting that this "rule of thumb" change may be further occurring for the R dez in the Southern dialect of ASL (Woodward 1975).

1.17 Elbow-to-Hand Shift - A second change also discussed by Woodward is the elbow-to-hand shift. Signs like HELP and SUPPORT were once made at the elbow. These signs are currently made on the hand - the dominant hand has thus moved away from the elbow to the hand (figure 8). Woodward states that older signers in certain areas (Minnesota and Oklahoma) still make these signs at the elbow, whereas the younger signers in those areas make the signs on the hand. Similarly, Louisiana Black signers sign PUNISH on the hand, whereas signers around the country make the sign at the elbow. Like "rule of thumb" change for the R dez, this phonological change illustrates that the elbow-to-hand shift in PUNISH may be occurring in certain dialects of ASL and not in others (Woodward and Erting, 1975).

1.18 Naturalization of Signing Space - The naturalization of signing space, discussed by Woodward, is also a common change in which signs that are made outside the normal signing space have been moved back into the normal signing space. For example, certain older signers would often sign both BRAINY and FIREMAN partially at the back of the head. However, these signs have been incorporated into the natural signing space (Woodward 1975).

As a whole, the sign changes discussed above show the common change in signs from iconic
to arbitrary. Signs have become more systematic, "giving the perceiver ways to predict signs in 'noisy' environments, increasing the number of true lexical items by removing boundaries between parts of compounds" (Frishberg 1975:717). Thus, these changes make signs easier and faster to make, and easier for the listener (viewer) to understand. Perhaps, if these changes had not occurred, signs would have been a random group of gestures with little or no relationship between them. However, the changes have created a highly formalized system in which phonological and morphological features are similar.

1.2 Challenge to Frishberg's hypotheses- However, not all linguists believe that the changes that Frishberg discusses in her research are actually historical changes. For example, in her 1982 Masters thesis, Margutti argues that the changes discussed above are not historical changes, but rather register shifts. Register shifts are, according to Margutti, shifts in language usage depending on the context in which one speaks. In both spoken and sign languages, speech can change in relation to the setting, the audience, and so forth. Margutti suggests that the two sources of information from which Frishberg analyzes are from different settings, and thus should not be compared with one another as historical changes. The sources that Frishberg uses in her analysis are old N.A.D. films and old sign language dictionaries and documents. As discussed above, Frishberg compares these older records of ASL with contemporary ASL, American Sign Language that Margutti claims is of a different register. Margutti argues, therefore, the original work, the tapes and dictionaries were of a formal setting (register), and the modern observations of Frishberg were in a less formal register.

In her own analysis, Margutti uses modern sources in which formal sign language is used, dictionaries and formal tapings of ASL (theatrical tapings), and compares the signs with the original tapes and dictionaries of formal register used by Frishberg. She finds that many of the changes that Frishberg observed are not seen when comparing the modern formal ASL and the original formal documented ASL. She also found that if one compares the modern formal ASL with modern informal ASL, one observes the same changes that Frishberg saw in her analysis and that
Frishberg declared were historical changes. Therefore, Margutti claims that the changes that Frishberg observes are actually changes in register rather than diachronic historical shifts (Margutti 1982).

1.3 Flaws in Margutti's argument. Although there is an element of truth in Margutti analysis, there are a number of flaws in Margutti's argument: few number of examples - thus a small sample size; Margutti's source of formal register may also be different than the one used by Frishberg and Woodward; a source of formal register from today, a modern source of data, which I argue is more like the sources that Frishberg used, shows the change Frishberg discusses. These flaws, along with research from other languages (discussed later) illustrate that historical changes like those described by Frishberg do occur in sign languages.

The small data and the often nonincompassing data set Margutti uses in her argument against Frishberg causes some problems for Margutti's argument. For example, she suggests that the fluidity and assimilation that Frishberg observes in her studies does not occur; she states that "signs in formal registers seem to be more segmented, that is, the signs can be picked apart more easily as was just seen with SISTER, and DAUGHTER" (Margutti 1982:26). However, SISTER, DAUGHTER, MOTHER, and FATHER are the only signs which she cites as following this example. These signs are all of the same family and are the only compound signs she discusses. Therefore there is little conclusive data for the lack of the assimilation and fluidity Frishberg observed. Second, she admits that "examples of reversals of symmetry principle are not common" (Margutti 1982: 26). This thus proves that the symmetry principle discussed by Frishberg is not affected by the register shift that Margutti describes. She also mentions that, "a number of examples can be found of signs which illustrate the reversal of the displacement principle" (Margutti 1982:28). Similar to her data on fluidity and assimilation, the lack of significant numbers of examples, further weakens her argument.

A second problem with Margutti's argument stems from the idea that Frishberg's analysis looked at formal register in the past and informal register in the present; Margutti claims that the
differences Frishberg observed were influenced by a change in register. The second flaw in her argument is the source of data she uses, and she claims are of a formal register comparable to the one used by Frishberg. For example, Margutti uses theatrical tapes claiming they are of the same register that Frishberg's older sources were part of. However, I have noted from personal experience that theatrical signing is often different than all other types of signing - exaggeration of certain signs and a larger amount of iconic signing. When discussing this with Donna Jo Napoli of Swarthmore College, she agreed with my observation.

The third flaw arises when looking at signs from a modern formal source of data. In the following section I discuss signs from a current formal source of ASL, Random House Webster's American Sign Language Dictionary (Costello 1998). The dictionary is of a similar register to the dictionary Frishberg used in her study. I therefore can compare the changes that Frishberg describes in her study with the signs from this particular dictionary without having to worry about change in register. According to this dictionary LAST/FINAL, DEPEND, and DIE all change to two handed, symmetrical signs; RAT and MOUSE all change from two to one handed signs; and, WRONG, DENY, and NOTHING all move away from the center of the face - all of which are similar to Frishberg's suggestions. Furthermore, within this dictionary, GOLD, TOMATO, and INFORM have assimilated similar to Frishberg's descriptions, and COMPARE and THINKING have lost the nonmanual features as suggested by Frishberg (Some of these modern day signs are shown in figure 9. Therefore, within a formal setting, an ASL dictionary, many of the changes that Frishberg discusses do occur. Some of those changes, especially those changes described as displacement may not all change the way Frishberg noted in her studies (for example, CAT, CHINA, COW, DEVIL, HORSE, are still made with two hands even though Frishberg claims that they should be made with one hand), but as a whole, the processes that Frishberg describes do occur in ASL, therefore disapproving Margutti's arguments.

1.4 Further evidence supporting Frishberg and Woodward changes - Changes that Frishberg describes, do occur. For example, research by a number of linguists around the world has shown
that sign languages do change similar to the way that Frishberg describes (Woodward 1976 - FSL, Woll 1990 - BSL, Radutzky 1990 - ISL, Woodward 1975 - dialects of ASL). In the following section I discuss changes in BSL, dialect changes, and differences in signers of various ages in detail. Through these examples, I further clarify that language change does occur in sign languages and that many of the changes that Frishberg notes in her study do occur in situations in which register shift is controlled.

1.41 BSL - In a 1990 study, Woll demonstrates that British Sign Language (BSL) goes through many, but not all, of the same changes as ASL - changes similar to those discussed by Frishberg and Woodward in the mid 1970's. Of the 455 signs that they were able to compare from the 13 different historical sources, including pictures, drawings and written descriptions, 41% of the signs did not change, 7% of the signs were replaced, 4% of the signs had a different meaning, and 48% of the signs were altered in some way. Like ASL, signs in BSL change toward morphological preservation. For example, in the older documents of BSL, BAD, ILL, and WRONG, were all words with negative connotations, contain the handshape with the little finger extended from the fist. Four other signs with negative connotations were found to change to a sign which uses this handshape: REJECT, DISGUST, FIGHT, and LAST. Similar to ASL, signs in BSL also go through the process of assimilation, change in location (away from the face and towards the use of neutral space), and loss of non-manual features. Compound signs are the most likely signs to change - 29% of those that change in Woll’s study were compound signs. This is true due to the sequential nature of these compound signs, and the process of assimilation can therefore occur. A number of different historical changes that Woodward and Frishberg describe in their studies do not occur in BSL. Most signs, not just those located at the face, tend to become one handed, and there is no elbow to hand shift. Woll notes though, that two handed signs are more formal and thus may be a change in register rather than an actual historical change.

Woll’s study is important in a number of ways. First, it shows, that like ASL, BSL changes. Of these changes, many but not all of the changes are similar to ASL. This is similar to changes in
spoken languages in that many languages go through similar process, but languages change
differently. The second interesting point from Woll’s study is that a larger number of texts and
documents were used. One of Margutti’s arguments with Frishberg’s original work was that the
various sources of information were of different register, thus not describing register shift. In
Woll’s study, a large number of different documents, thus a larger sample size could be used.

1.42 Speakers of different ages - Another technique by which one can look at change in language is
by observing signers of various ages. However, before I continue, I must discuss the age-grading
hypothesis - the basis on which historical change can be described in terms of different age groups.
The idea of age-grading versus generational change is based on a study by William Labov in which
he analyzed the amount of centralization of the diphthongs /ai/ and /au/ in different ages of speaker.
In this study, he found that on Martha’s Vineyard, the younger people had less centralization than
the older. One explanation could be that as one grows older, the diphthongs becomes more
centralized. Generational change on the other hand suggests that this change is due to each
generation speaking different from the proceeding, each generation therefore centralizes the
diphthongs more than the proceeding one. Luckily, Labov had old records that could help
determine which of these hypotheses is correct. He found based on these studies that centralization
has not changed for the individual speakers. In other words, it seems like based on this study, and
studies since this time, that each generation has differences in their dialect, thus supporting the
generational change hypothesis (Labov as cited in Trask 1995).

Although a formal study has not been done, some of the research by Woodward on sign
language change describes instances in which he notes differences in the signing of signers of
different age groups. For example, Woodward suggests that older signers often sign differently
than younger ones. For example, as mentioned above when discussing the elbow-to-hand shift,
some older signers in Minnesota and Oklahoma, still make the sign for HELP and SUPPORT at
the elbow. Woodward also shows that white Americans over the age of 47 used two handed signs
more than younger whites. Also, black signers under the age of 47 used two-handed signs more
than white signers (Woodward 1976:82). Although the data is limited, these few examples first support the idea that languages change, and secondly, many of the changes that Frishberg observed in her studies are actual historical changes and not simply changes in register shift.

1.5 Summary - In the above section I used research over the last 20 years to argue that languages do change and that the processes which Frishberg and Woodward discuss - movement toward symmetry, displacement, assimilation (fluidity), morphological preservation, and concentration of lexical information in the hands, "rule of thumb", elbow-to-hand shift, and naturalization of signing space - do occur. These changes do not occur in all languages, but similarly historical changes in spoken languages do not occur in all spoken languages. The analysis was necessary to illustrate that languages do change and to point out the significance of these changes described by Frishberg and Woodward. Below I will take the analysis of these historical changes further and discuss the changes in light of historical changes in spoken languages.7

7 I must note that there is some validity in Margutti's thesis; there may be influence of register shift. Because of the nature of sign language, the fact that there are not many written records, it is difficult to get a clear picture as to the actual historical changes, and which changes are due to register shift. However, signs do go through changes. Because other sign languages go through similar changes to ASL, because there are slight dialectical differences between sign languages, because certain studies show that different signers of different ages do have different signs, and because I illustrated through a mini-study that Frishberg's changes have occurred at some formal level, sign languages, like all spoken languages, change.
PART II

2.0 A comparison sign language and spoken language change - Thus far, using documented change from various sources, I have illustrated that sign languages do change. Furthermore, I have argued that the changes that Frishberg and Woodward discuss do occur in sign languages, although not all of the changes in all sign languages. In this section, I am interested in further describing historical changes in sign language - examine similarities of change in sign language and spoken language. In this section, I will look at the following questions:

- What, if any, are the similarities between changes in spoken languages and sign languages?
- Can the same descriptions of historical change be used for both sign and spoken languages?
- Can Changes in ASL be viewed in light of the regularity hypothesis - regular change is the process by which a segment sound (or in ASL, a phonological feature) changes in all words that contain that segment.

In light of these questions, I will argue that similar underlying processes do occur in sign and spoken languages. For example, I will argue that the processes of assimilation, deletion, ease of perception, and fluidity are important in the change of both spoken and sign languages. However, due to differences in the phonology of spoken and sign languages, the nature of lexical borrowing in sign language versus spoken language, and the iconicity in newer words in sign language, historical changes in sign language must be viewed differently than those changes in spoken languages. Thus a well documented historical process like the regularity hypothesis which occurs in spoken languages does not seem to occur in sign languages.

2.1 Pertinent information to the comparison language change - Before beginning the comparison of sign language and spoken language I must make a digression into the differences between spoken and sign language. In this section, I will discuss iconicity in terms of sign language, spoken language influence on sign languages, and a few other differences. A discussion of these topics should provide necessary insight for further comparison of changes in sign language.

2.1.1 Iconicity - A key difference between spoken and sign languages, a point important in the later comparison of change in the two languages, is the iconic nature of sign language versus that of
spoken language. Spoken languages do have certain elements of iconicity; for example certain words can represent the sounds of the word they describe. The most notable example of iconicity in spoken language is onomatopoeia, in which the sound that the vocal cavity makes is similar to the sound of the object being described (i.e. buzz and lisp). There are other cases in which spoken words have elements of iconicity, but as a whole, words in spoken languages are arbitrary units and have little to do with the nature of the words they describe.

On the other hand, due to the manual/visual nature of sign languages, sign languages are more "susceptible" to the iconicity. There are a number of ways in which one can define the term iconicity. Mendel, for example, defines iconic in sign languages as "perceived by signers, or potentially perceived by them, as visually related to its referent" (1977:58). Within his definition, there is a continuum for the iconicity of sign language - some signs are iconic, representing the exact word, and others have little or no pictoral relationship. For example, BLACK, in which the forefinger is drawn across the forehead, has no visual relationship to the word it represents. In terms of Mendel's definition, HOUSE is iconic in that a signer sketchers the outline of a house in the air in front of the his or her chest. According to Mendel, even more iconic are the signs for BASEBALL in which the signer pretends to be holding a baseball bat at shoulder height, and NOSE which is signed by pointing toward the signer's nose (Mandel 1977:59).

Iconicity can also be defined as the direct relationship between the sign and the word they are making. Under this relationship HOUSE would not be directly iconic because if the signer does not have an understanding of the sign for word relationship, he or she will not know what the signer means. Only after the viewer knows what the sign represents does he or she know what the word means. A house can be different for different cultures; therefore an outside viewer would not always think that the outline of the house has an exact iconic relationship to the sign. This type of iconicity is the one discussed in the beginning when I discussed the misconceptions of sign language. However, under this definition, those signs which are labeled iconic like HOUSE, do have a pictorial relationship.
No matter which definition one uses for the iconicity, the fact there is a pictoral relationship between the sign and word in sign language is important to note when discussing sign language change - "Picture-making is a significant part of ASL communication" (Mandel 1977:91). However, though I have discussed earlier in this paper that the iconicity of sign languages is not the most significant aspect, the underlying pictoral nature of signs must be discussed in sign language. As I will argue later, because new signs are often introduced into sign language through iconic/pictoral means, these new signs are more susceptible to change than spoken languages. In the rest of this paper when I discuss iconicity of sign language, I am referring to the pictoral aspect of many signs, often signs which have more recently been introduced.

2.12 Influence of other languages - An important factor in phonological change in any language, spoken or sign, is the influence of other languages. Languages are often influenced by the spreading of linguistic features from one language to another. To further the comparison of changes in sign language and spoken language, a comparison of language influence on spoken languages and sign languages is important. This comparison between spoken and sign language will be useful in understanding historical changes in sign language. Such a discussion will also aid in analyzing the changes in sign language in terms of spoken languages - illustrating where changes come from and how these changes influence the language.

Spoken languages borrow words and features from one another. Because of the number of languages in the world and because the speakers of these languages are often in contact with one another, words in spoken languages are borrowed. In spoken languages people adopt new words for a number of reasons. First, the culture surrounding the introduced language may be something completely new to the culture in which the word is being added. For example, *kayaks*, *skies* and *yogurt* were all words that were borrowed from other languages into English. Another reason for borrowing a word into a language is prestige. For many years, speakers of English used words from European languages because European languages were viewed as more prestigious. For example why refer to a woman's bottom or behind when a more "ladylike" word like *derriere*
could be used? Another reason that words are borrowed into a language is because of power. For example, because of the economic status of Germany at certain times throughout history, many German words have been borrowed into other languages (Trask 1996: 17).

However, borrowing in spoken languages is not simply incorporating the exact word into one’s language. The words often go through a transition when borrowed. With spoken languages, the phonology is often changed to fit the language - to fit the phonological features of the language. The language which is borrowing the word often has a completely different phonological system and thus must alter the borrowed word when introduced. For example many languages do not have the phonemes that the introducing language has and therefore the “recipient” language uses phonological features and rules from the particular language which best fit their system (Trask 1996:24-27). For example, in Japanese, borrowed words for English like milk, apple pie and waffle are, miruku, appuru pai and waffuru in Japanese (Trask 1996:50).

Lexical borrowing and influence of other languages on ASL is different than that in spoken languages. First, sign languages have very little contact with one another. It is therefore difficult for sign languages to influence one another in the same manner that spoken languages influence each other; lexical borrowing between signed languages is limited. As discussed earlier, ASL is directly related to FSL, but since its original introduction into the United States, little contact between the two languages has remained (Battison 1978: 91-92). This is one of the reasons why ASL has diverged from FSL so rapidly.

Another way in which influence on sign languages differs from influences of spoken languages is the close contact with the spoken language; in the case of ASL, English is the dominant language in the environment in which ASL is signed. In the past, and within many communities, people have seen English as the more prestigious language and still today, many consider ASL inferior to spoken languages. In the surrounding community of most ASL signers, people of power, political and social, speak English. More importantly, ASL is in direct contact with spoken language because they share the same written language. Therefore, ASL is constantly
being bombarded with English phonology, syntax, and semantics (Battison 1978:95-105).

One can group the influences of English on sign language into two categories, natural and artificial. Artificial influences are "those which are due to deliberate manipulation and engineering (mostly for pedagogical reason)" (Battison 1978:96). For example, people have tried to contrive a signing systems which mimics more the English system, so that it is easier for non signers to communicate. There are also natural influences of English. Natural influences are "not primarily due to conscious efforts on the part of language engineers or sign contrivers" (Battison 1978:99). There are a number of ways in which sign languages can be naturally influenced by other languages.

2.13 Other changes - The iconicity of sign languages and the influence of spoken language on sign languages make sign languages different than spoken ones. There are other differences in sign language and spoken language that are important. First, deaf children are often not exposed to sign language until they reach school age because only a small percentage of deaf children are born to deaf parents. For example, Battison says:

The structure of the deaf educational and social experience in the U.S. is such that it lends itself very easily to the development of many varieties of language, to the development of a Pidgin Sign English, and to the development of a situation where English is very highly regarded and signing, especially ASL, is accorded very little respect (1978:94).

As discussed above, another key difference is that the phonological units of sign language are made simultaneously while those in spoken language are made in sequence. These differences are important to understanding the relationship between changes.

With an understanding of these basic differences between spoken and sign language, I now will describe historical changes in spoken language. Once historical changes in these spoken language have been discussed, I will analyze historical changes in ASL in light of spoken language change. Finally I will consolidate this information, changes in sign language, changes in spoken languages and differences between the two, and argue that with the current data (which is not the richest set of data), similarities between spoken and sign languages can be described at the basic
level. However, other diachronic process that work for spoken languages do not occur because of these distinct differences.

2.2 Historical changes in spoken language - Phonological change of spoken language has been well studied and many processes have been documented. I will limit my discussion of phonological change. In the following section I focus on only certain aspects of change in spoken language - those changes and theories that best pertain to the discussion of change of sign language. I discuss major classes of phonological change and then compare sign language in terms of these classes. I also examine the principle of the regularity of change, a process that often occurs in spoken language and discuss if the regularity hypothesis can be applied to sign languages.

One major class of changes in spoken language are assimilatory changes. Assimilation is the process in spoken language in which sounds next to each other become more alike, thus gaining features of the surrounding sound environment. The process of assimilation eases the effort and movement in the oral cavity, and thus assimilation occurs often in spoken languages. For example, nocte [nokte] in Latin has become [notte] in Italian. The [k] changes to [t]. When compounding the word [lan] and [bide] in Basque, the nasal is influence by the [b]. The compound word is therefore pronounced [lambide], the [n] changing to [m]. The first example is called total assimilation, and the change is completely similar to the surrounding environment. The second example is called partial assimilation in which only some features of the phonological unit are shared from the surrounding environment. Assimilation in spoken language can be anticipatory or regressive assimilation. Anticipatory assimilation occurs when the sound before the changing sound influences the unit and regressive assimilation occurs when a later sound influences the earlier one. The sound can also be influenced by the units before and after the sound (Trask 1996:54).

The second major class of phonological change that I discuss is lenition, or weakening of sounds. Consonants often have a tendency to become weaker. The following list is one describing different sound changes in terms of lenition:

<table>
<thead>
<tr>
<th>Lenition</th>
<th>Example</th>
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<tbody>
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<td></td>
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Numbers 1-4 require different amounts of airflow in the mouth; number 5 requires different amounts of airflow in the nasal cavity; and the last reflects different amounts of tension in the voice box. Lenition almost always occurs between vowels. Because vowels require movement, the process of lenition occurs to reduce this movement - thus the consonants become more vowel like. An extreme form of lenition occurs when a language deletes sound all together (Old English *heafod* > English *head*).

There are also a number of whole segment changes that occur in spoken languages. For example, an entire segment may be lost (in contrast lenition is a gradual process). An example of deletion is the [k] sound in *knee, know, and knife*. If lenition had occurred for the [k], then the change would have been more gradual; here the sound simply dropped from speech. In addition to segments at the beginning and the end of words, medial sounds can also be lost. In contrast, prothesis is the process by which a segment is added. Segments can be added at the beginning, middle or ending of the word. Another segmental change in spoken language is metathesis, which is the reordering of segments within a word.

These are not the only phonological changes that occur in spoken languages. However, in terms of this paper, these are significant enough to make comparison between spoken and sign language and to discuss the processes which are similar and different for these two types of language. Below, I touch on a few other processes in spoken language change, like regular change and chain shifts, which further elaborate changes in spoken language. In the following section I again discuss the changes discussed by Frishberg and Woodward: movement toward symmetry, displacement, assimilation (fluidity), morphological preservation, and concentration of lexical
information in the hands, "rule of thumb", elbow-to-hand shift, and naturalization of signing space, in terms of the processes discussed above.

2.3 Historical changes in sign language in relation to spoken language - The processes which Frishberg and Woodward describe as assimilation and deletion are highly similar to assimilation and deletion discussed above for spoken languages. For example, for the description of TOMATO, Frishberg notes that the sign has changed from RED and SLICE to a process which has elements of both signs - the orientation of the first part of the sign has changed in anticipation of the second and the R handshape is currently used throughout the entire sign. This example is similar to both anticipatory assimilation and regressive assimilation discussed above. Other signs like INFORM (KNOW + BRING), HOSPITAL (SICK + HOME) and GOLD (EARRING + YELLOW) have all assimilated similarly to words in spoken languages. Deletion in ASL is also similar to the deletion described above in terms of complete segment deletion. For example, the original sign for SPRING, contained SUMMER and GROW. As Frishberg describes, the sign has lost SUMMER and a slightly altered form of GROW now represents SPRING. Thus, these changes in compound signs in ASL are similar to the processes of deletion and assimilation observed in spoken languages. Whereas most phonological features in sign language occur simultaneously, compound signs have an element of sequentiality to them. The sequential segments of the words can therefore influence one another similar to the sequential elements of spoken language affect each other.

Lexical content limited to the hands, displacement and movement toward symmetry are types of sign language change which are only related to changes in spoken language because they deal with ease of perception and fluidity of articulation. Frishberg proposes that these processes occur to ease the perception for the viewer, to bring the signs more within signing space, and make the signs more fluid. For example, signs made at the waist often add a second hand and signs made at the face tend to move outward and can change from two to one-handed signs. This is comparable to spoken languages in a more abstract sense. Although not discussed above, in spoken languages vowels often move around phonetic space, a process called chain shift. One vowel may begin to
move in phonological space (although linguists are not quite sure why these vowels begin to shift). However, because such a vowel often moves toward the articulatory space of another vowel, the second vowel must move. In spoken languages, contrasts in sounds are important. Figure 10 shows what linguists call the English Great Vowel Shift. According to Trask, the vowels do a "little dance" (1995). This dance keeps the vowels enough apart for easier perception. Similarly sign languages move units to ease perception. In sign language it may be the movement of a sign closer to the signing space and in spoken language it may be the movement of a vowel away from another to make a clearer distinction between the two. Both ease the perception, thus making the word or sign easier to perceive.

However, these similarities are only at the abstract level. For example, lexical content limited to the hands, linguists have observed the change in signs in which certain aspects of a word were made using a part of the body other than the hands to a sign in which the hands take on the non hand feature. In spoken language, a language which uses only auditory devices, such a parallel cannot be drawn. In sign languages, the visual system is employed and thus anything which can be seen could hypothetically be used as a phonological unit, like the head movement in the older form of THINK. Other parts of the body could be used to make sound in spoken language, but all phonological units that occur in spoken languages occur within the speech tract. Symmetry is another example which cannot be directly compared to spoken language. As Frishberg discusses, the process of symmetry occurs when two hands, which at one time had a different movement or handshape, change to a sign with both hands having similar hand shape and or movement. In spoken languages, such a process can not occur for this change is based on two articulators.

One of the most noted historical changes in sign languages is the tendency to move from iconic to arbitrary - picking up many of the "phonological" features in spoken language. This process cannot really be compared to spoken language because the lack of iconicity in spoken language. However, Donna Jo Napoli and Ted Fernald (in a paper in draft form) suggest that at one time, languages which were more iconic in nature did go through such processes (personal
correspondence). For example, "gl" used in words like, *glitter, glow, glaze, glisson, and glamour* are all shining words. However there are a few words in which the "gl" has nothing to do with the word being a shining word - *glue, glob, glucose*. If these "gl"'s were at one time related, the evolution of the language may have made these words less related. Since ASL is a relatively new language, we may be currently witnessing a similar process. Also, because new words are constantly being introduced into sign language through spoken language and pidgin sign, such a process continues to occur.

2.4 Regular Change - Regular change is another process important in spoken historical change. By definition, regular change is the process by which a segment changes its sound in all words that contain that segment. Regular changes do not alter the meaning of the word, and the changes always occur without exception. We can use the question Trask asks when predicting whether change in a language is regular: "when change is introduced into a language, does it occur in all places?" (1996:69). For example, in spoken language, /d/ changes to /t/ from Indo European to Old English (part of Grimm's Law). From this transition of Indo European to Old English, words like “dekm” changed to “teon.” Because this was a regular change, and not just a random change, the change of /d/ to /t/ occurred in all words. Another example is [tʰ] in the transition of Old English to English. All places in which /t/ is followed by a vowel, [tʰ] changes to [tʰ]. Also, in Japanese, /p/ has become /h/ in all places except when it geminated (Trask 1996:69). There are thousands of examples of regular change in spoken language, all following the parameters used to define a regular change. In spoken languages, regular changes are therefore uniform changes in a unit of phonology that do not change the meaning of the word.

Are the changes described by sign language linguists in the past 20 years examples of regular change? Moser suggests that the changes in sign languages are not regular changes, but rather tendencies. As stated earlier, in spoken languages, regular changes occur within the entirety of the phonology of the language. In all cases, regular changes are not without exception. Moser claims
that those changes described by Frishberg in 1975, assimilation, movement toward symmetry, displacement, Assimilation (fluidity), morphological preservation, and concentration of lexical information in the hand, are not all inclusive but rather tendencies. These changes increase the naturalness, redundancy and ease. These changes make it easier to perceive and articulate while also increasing arbitrariness.

Moser mentions that the study does not mean regular changes cannot occur in sign languages, because the literature describing change in spoken languages is vast compared with that of sign languages. However, he believes that two tendencies of sign language provide evidence that even with further historical data, cases of regular change would not occur in sign languages. First, ASL has a tendency to avoid homonyms. In spoken languages the result of regular change is often a merger of two phonemes to form a homonym. As discussed above, Grimm's law describes a case in which homonyms could be created from regular change in spoken language. Moser claims that because sign languages avoid such mergers, it is a good indication that regular changes do not occur. A second point that invalidates regular changes in ASL, according to Moser, is that ASL does not have predicted variation, which Moser describes as a prerequisite for regular language change (Moser 1990:5).

However, it is possible that the "rule of thumb" change described by Woodward in 1975, has features of a regular change in spoken languages. Allow me to go back to Trask's question of regular historical change: "when change is introduced into a language, does it occur in all places?" As described by Woodward (see above), the "rule of thumb" seems to be occurring in all G and H hands and in some dialects of sign language the R falls under the "rule of thumb" hypothesis. So a rule could be proposed which suggests that the thumb is extended in cases in which the handshape G and H are used, thus fitting the qualities necessary to be considered a regular change. However without more data, such a proposal is simply speculation.

2.5 Summary of the Comparison of Spoken and Sign languages - As discussed with both sign language and spoken language, fluidity, assimilation and deletion seem to be major components of
change. As discussed above many of the changes that do correspond significantly to changes in spoken language occur within compound signs, those signs which have sequential aspect to them. Therefore for compound signs, there is a distinct parallel between spoken and signed languages.

Even though certain changes do occur in both sign and spoken languages, a number of differences are key in understanding the differences in the change of the two languages. For example, the simultaneous nature of the phonological gestures of sign language make it difficult for many of the changes that occur in spoken languages to happen in sign languages. Second, changes like elbow-to-hand shift, displacement, and "rule of thumb" can only loosely be compared to sign language change because of the different articulatory devices being used in the two languages. Symmetry is also difficult to compare to spoken language because it revolves around the idea that there are two articulatory devices instead of one. Finally, lexical content limited to the hands is difficult to compare to spoken languages, because there is no strong influence of some external language factor like body movement in spoken language. Therefore, the underlying principles of change, the need for fluidity, and ease of perception, are key for both spoken and sign languages, but the existing data on ASL suggests exact change in sign language must be described differently.

The influence of spoken languages on sign languages, the structure of the deaf education and social experience, and the pictoral nature of newer signs in sign languages, also make the languages different - new words which do not have the arbitrariness that older signs are always being added to the sign language. In one way the borrowing is similar to the process in spoken languages. For example, words borrowed into spoken language phonologically change to fit the language, similarly words borrowed into sign language change to fit the phonology. However, in spoken languages, the regularity hypothesis states that all cases in which certain feature occurs, must change for the regularity hypothesis to occur. However, the reason that some sounds that have changed in the past still occur in spoken languages is because of borrowing. For example, Basque lost all intervocalic [n], but since then, Basque has borrowed hundreds of words that contain that [n] (Trask 1996:59). Unlike the sporadic borrowing of new words in spoken languages, new signs are
constantly being added to the sign language through spoken language influence and the social structure of the deaf children. Therefore, because these forces are so dominant in sign languages, new words are always being added, the language is always changing, and it is very difficult to observe any regular change. 

Throughout the paper I have used work on ASL as a model system for describing change in sign languages. I noted earlier that other sign languages do not go through all the same changes as ASL, but many of the processes are the same. In this paper I discuss how the influence of social structure and the influence of the surrounding spoken language is important in the differences in change between spoken and sign language. However, not all sign languages have the same external forces, but I am assuming that in most cases many of the influences I discuss occur at some level and that the difference hold true. It would be interesting to find a case in which the external influences are not as strong and see if sign and spoken language change are more similar.
Conclusion

3.0 Conclusion - In this thesis I set out to analyze historical change in sign language. I first wanted to discuss sign language change at a basic level: if sign languages change, what these changes in sign languages are, and how sign languages change. Frishberg, Woodward, Woll and a number of other sign language linguists have shown that sign languages do change. Though Margutti suggests the changes that Frishberg describes in her studies are register shifts; lack of data from her study, data from recent formal register, and further studies from the Frishberg, Woodward, and Woll illustrate that the language changes that Frishberg and Woodward describe occur.

Because the changes cited by Frishberg, Woodward, and Woll - symmetry, displacement, assimilation and fluidity, lexical content limited to the Hands, morphological preservation, elbow-to-hand shift, and "rule of thumb" - do occur in sign language, the second part of this thesis further discussed the process of historical change in comparison to spoken language change. On a basic level, I argue that similar processes occur in both types of language. Fluidity, assimilation, deletion, and influence of ease of perception are all important to the changes in both spoken and sign languages. However, certain differences between the spoken and sign languages add variations in the way one views change. First, Moser discusses that the changes discussed by Woodward and Frishberg cannot be viewed as regular changes because of the nature of sign language. Because the regularity hypothesis is a key process in historical linguistics, such an argument challenges the similarity of historical change in both languages. Furthermore, the simultaneity of the phonological features in ASL, the fact that sign language has two articulators instead of one, the constant influence of spoken language, the basic element of iconicity in sign languages, and the fact that signers of different sign languages are not often in direct contact with one another provide a linguistic environment in which change occurs differently.

3.1 Future Study - A common theme throughout this paper has been dealing with the lack of historical texts in ASL and other sign languages thus making the study of historical changes in sign language difficult. In spoken languages it is easy to describe and study historical change because
written texts exist. However, with sign languages, time and time again linguist run into the problem of lack of and poor documentation. One way in which ASL has been documented recently is through the use of video technology. Only recently has video documentation allowed for better study of ASL, but too recently to allow for extensive historical data. Perhaps there are examples of register shift similar to the one I suggested above.

With this in mind I would like to proposed a socio linguistic study that might shed some light onto historical changes in sign languages. This proposal is a different method of historical analysis, a method which has gained support over the last 20 years as a competent analysis looking at change. Rather than viewing documents and attempting to analyze change through internal reconstruction, which is extremely difficult to do in sign language because of the nature of the language and lack of written records, I suggest studying live subjects of various age groups and comparing differences in their signs. As mentioned above, Woodward notes that older signers often sign differently than younger ones. The younger signers do not use the protrusion. Similarly, also mentioned above when discussing the elbow-to-hand shift, some older signers in Minnesota and Oklahoma, still make the sign for HELP and SUPPORT at the elbow. In other words, different age groups reflect different changes (Woodward 1975).

In my study, I would analyze different age groups and compare the phonology of their signs. It is important to note that children, and therefore, adults, speak more like their peers than their elders - "Classmates and close friends are linguistically more influential than teachers and parents." (Chambers 1995). I can bank on this idea of differences in languages and study how the signs have changed. Formal register could be controlled for and plenty of data could be collected. I could hopefully determine how accurate Frishberg's changes were, determine whether regular change does occur in sign language, and discuss the similarities and difference between spoken and sign language in more detail. Furthermore, similar studies could be done with other sign languages around the world.
Literature Cited:


Appendix - Tables and Figures

Figure 1. The possible hand configurations in ASL (Friedman 1977)
Figure 2. The signing space in ASL (Frishberg 1980)

Figure 3. Minimal pairs in ASL (Costello 1998)

3a) WHICH & CAR- only difference in handshape

3b) SOUR & CHINESE- only difference in place of articulation

3c) NAME and SHORT - only difference in movement

3d) NAME and SIT - only difference in orientation

(SEE ABOVE)
Figure 4: Examples of changes in symmetry in ASL (Frishberg 1980)

4a) Change in LAST/FINAL

4b) Change in WORLD

4c) Change in ANGRY

Figure 5: Examples of changes by assimilation in ASL (Frishberg 1980)

5a) change in INFORM

KNOW OFFER meaning 'inform' in 1918-ASL

INFORM in M-ASL
5b) change in TOMATO

Figure 6: Examples of Changes by lexical content limited to the hands in ASL (Frishberg 1980)

6a) change in BORING

6b) change in COMPARE

6c) change in THINKING
Figure 7 Example of morphological preservation - STEAL (Frishberg 1980)

Figure 8: Example of elbow to hand shift - HELP (Frishberg 1980)
Figure 9: Illustrations from a current ASL dictionary (Costello 1998). These signs are similar to the later signs Frishberg noted in her study. (the signs with the * can be compared with signs in figures 3-8)

Examples of symmetry

Examples of lexical content limited to hands

Examples of displacement

Examples of assimilation

Figure 10. The Great American Vowel Shift