

A PRELIMINARY STUDY OF THE CHARACTERISTICS OF  
STYLE-SWITCHING IN AMERICAN SIGN LANGUAGE AS  
A FUNCTION OF PARTICIPANTS

by

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## ABSTRACT

This study was designed to isolate and describe the features of American Sign Language (ASL) that vary according to social parameters. Two assumptions underlie this proposition: ASL is a natural language of the world, and users of languages of the world demonstrate variation in style which is triggered by specific social factors. The study examined and compared linguistic and paralinguistic features of a native ASL user's signing under different social conditions.

Six people took part in the study. The principal subject or Sender was a profoundly deaf, native signer of ASL. Five other people acted as Receivers. They were all users of ASL and differed from the Sender in one or several of the social variables: age, occupation and proficiency in ASL.

The Sender signed seven tasks to each Receiver separately. The tasks included instructions, paraphrase, directions for completion of a puzzle and questions. Each Sender-Receiver dyad was videotaped in a recording studio. Data was transcribed and analyzed for evidence of seven performance parameters including lexicon, morphology, syntax, rate, headtilt, body movement and amplitude. It was predicted that each of the social variables would contribute to a unique Receiver profile based on amount of use of each performance parameter.

The results of this study show that the Sender modified his signing of each task to each Receiver. The modifications were not as systematic on the basis of social variables as predicted. Comparison of Receiver profiles reveals two styles of signing, distinct from a third neutral style. The Sender's signing to a child, who ranked lower than himself in terms of age, occupation and signing proficiency was characterized by redundancy of the message and reliance on parameters that augmented clarity. The second distinct style seen in the Sender's performance to an adult, who ranked higher than himself on all three

social variables, was marked by increased complexity.

Comparison of tasks revealed a marked distinction between the Instructions and the Paraphrase tasks, thereby establishing a profile for an information-giving style and a story-telling style.

This investigation was able to furnish preliminary information about what changes occur in ASL given different tasks and different participants.

Carolyn Johnson

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## CHAPTER 1

### LITERATIVE REVIEW AND STATEMENT OF THE PROBLEM

#### Introduction

Sociolinguists have shown that competent users of language exhibit linguistic variation which is systematically related to dimensions of the social situation in which the speech event occurs. This phenomenon, identified now as style-switching, has been confirmed in many of the natural languages of the world, including English, Japanese, Hindi and others. Although there has been some discussion about style-switching in American Sign Language (ASL), few studies have attempted to identify the features of ASL that undergo systematic variation within a given social situation. The thesis developed in the current study is that it is possible to isolate and describe the features of ASL that vary according to social parameters. Two assumptions underlie this proposition: (a) ASL is a natural language of the world, and (b) users of languages of the world demonstrate variation in style which is triggered by specific social factors.

#### American Sign Language as a Natural Language

The view that ASL is a natural language of the world has been widely accepted only recently. Prior to the middle 1960's, ASL was considered a loosely connected array of pantomimic gestures. The appearance of Sign Language Structure (Stokoe, 1960) and the Dictionary of American Sign Language (Stokoe, Casterline & Croneberg, 1965) marked the departure point for the study of sign language. These works were the first to recognize the internal organization of a sign language and included discussions of methodological, sociological and linguistic issues. That ASL is a rule-governed linguistic system has taken years and a vast amount of indisputable evidence to establish. And there are still sceptics!

Most investigations of ASL (and other sign languages) deal with the following issues: the nature of the internal organization of sign language; and what additional information sign language provides regarding human linguistic capacities. Examination of these issues will be provided as a basis for understanding and interpreting the data which will be presented later.

#### Comparison of Sign Language With Spoken Language

Four major beliefs about sign language have contributed to the reluctance on the part of other language communities to accept ASL as a natural language. These beliefs, now termed "myths" or "misconceptions" (Battison, 1978; Siple, 1978), are related to supposed (1) universality of sign languages; (2) dependency on spoken languages; (3) iconicity and transparency; and (4) restricted range of expression. There is now evidence sufficient to dispel these apparent misconceptions.

#### Universality

One false notion about ASL is that there exists one mutually intelligible sign language for all deaf communities in the world. There is ample evidence, however, that unique sign languages exist in a number of countries such as China, Denmark, Haiti, Israel and Spain. Despite similarities (probably imposed by general constraints on signed languages), differences among these languages are present at many linguistic levels.

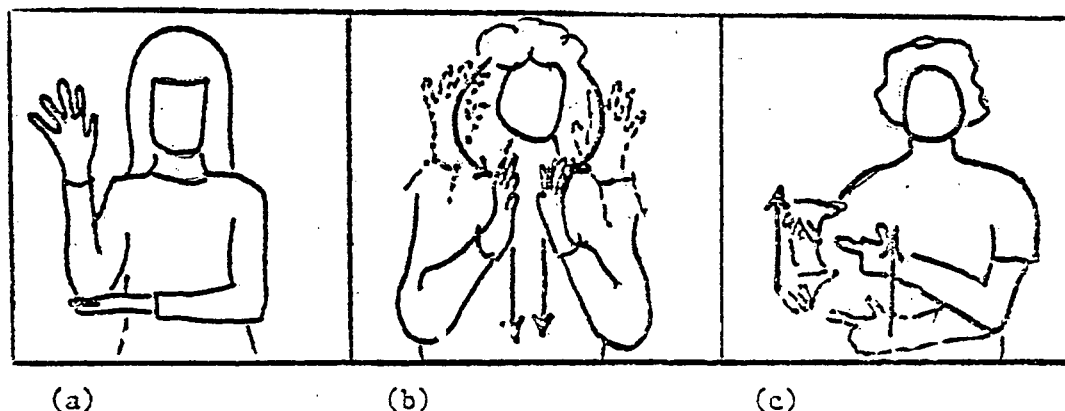
Examination of sign dictionaries in different countries shows that not all sign languages denote the same things with the same signs. Woodward (1975, cited in Battison, 1978) compared 872 signs from American and Parisian Sign Language. He found that, for these two historically related sign languages, only 26.5% of the signs were identical.

Bellugi & Klima (1975) and Mayberry (1978) compared ASL with Chinese Sign Language and French Canadian Sign Language, respectively. Both investigations reported differences in formational aspects of the languages they compared: sign forms not used in ASL but present in the other sign languages, and impossible ASL forms. For example, in ASL the /F/ hand configuration is made so that the thumb and index finger

constitute the contact region, as in VOTE, IMPORTANT and FAMILY<sup>1</sup>. In Chinese Sign Language, the same pinching handshape is used, but the three extended fingers are the prominent part of the sign, as in CHOP and QUESTION.

Lexical differences also show up in comparisons between sign languages. The sign TREE in ASL, Chinese Sign Language and Danish Sign Language is different in terms of formational aspects (See Figure 1). It is interesting to note that each of the three signs bears some iconic resemblance to the referent; however, this relationship does not determine the details of formation.

Figure 1. The sign for 'tree' in (a) American Sign Language; (b) Danish Sign Language; and (c) Chinese Sign Language (Adapted from Klima & Bellugi, 1979:21)



To demonstrate inter-sign language comprehension, Jordan & Battison (1976) asked pairs of fluent signers to describe pictures to one another. These descriptions were videotaped and presented to signers who were fluent in the particular sign language and to those who were not. The receivers, who had to select the target picture, were more successful when descriptions were presented in their own sign language. The investigators concluded that deaf signers can understand their own language better than foreign sign language, which would not be the case if sign languages were mutually intelligible.

#### Dependency on spoken languages

The second misconception regarding sign language is that it has

<sup>1</sup> English glosses for ASL signs are represented in capital letters. See Appendix A for further notational conventions.

no structural organization of its own, but instead reflects a sign-for-word manual translation of the local spoken language. This view may have been upheld by the knowledge that it is possible to encode an oral language manually through fingerspelling.

Fingerspelling, in ASL, is a set of "digital symbols which stand in one-to-one relationship with the letters of the English alphabet" (Stokoe, 1960:33). It is used to supplement lexical items with grammatical inflections, such as plural -s, as well as to provide English words where no sign is known; names and technical terms are often fingerspelled. Fingerspelling can be seen as a type of borrowing between languages. It is not, however, used by any linguistic community as the sole means of communication.

Another confusion that has suggested sign language dependence on spoken language structure is the possibility of coding a spoken language manually. This is frequently seen when hearing people learning sign language base their expressions exclusively on English syntax. In addition, several attempts have been made to combine ASL with the grammar of English. An example of such a methodical signing system is Signing Exact English (Gustason, Pfetzing & Zawolkow, 1972) which was developed for the purpose of displaying English manually. It has been useful as an educational supplement and includes ASL signs with the addition of affix markers which correspond to English grammatical morphemes. As with fingerspelling, Signing Exact English is not used exclusively by any deaf community.

### Iconicity and transparency

There is a popular belief that signs are not arbitrary symbols, but instead carry an iconic or representational resemblance to their referents. Because of the apparent iconicity, ASL's potential for symbolic representation has frequently been questioned.

Although the inexperienced eye may view the gestures of ASL as a direct physical representation of certain lexical items, detailed analyses have shown this not to be the case. Several procedures have been adopted to measure the degree of transparency of ASL signs. Bellugi & Klima (1976) presented 90 ASL signs and their English glosses to a group of 10 hearing nonsigners and asked them to describe the basis for the resemblance between each sign and its meaning. Results

indicate that there was general agreement among subjects as to the possible relationship between the signs and their glosses for more than half the signs. A second group of 10 hearing nonsigners were asked to guess the meanings of the same 90 signs. In this case, subjects determined the correct meaning for only nine of the 90 signs. This study revealed that due to modality of production of signs, a certain amount of iconicity is inevitable, but that this does not interfere with the potential for arbitrariness of the signs of the language.

Mandell (1977) suggested that the iconic devices utilized by ASL are constrained by rules. A good example of an iconic device is that used in the sign EGG. This sign is clearly related to the breaking open of an eggshell. The action is highly stylized, however, in that the fingers of each hand interact in a way that would not realistically depict the holding of an egg. Klima & Bellugi (1979) asked 10 nonsigners to convey in gestures the meaning of the word egg. Although each subject gave a similar rendition in terms of theme--picking up a small oval object, hitting it, etc.--the details varied greatly in style. Whereas the pantomimes varied, different renditions of the sign EGG by experienced signers were very similar. Hoemann (1978) accounts for the similarity across signers by suggesting that pantomime is drama, and is not restricted to the set of locations and movements that are the structural features of ASL. He believes that in ASL well-formedness in terms of features is more important than pantomimic effectiveness.

In analyses of historical changes in ASL, researchers show evolutionary alterations of 'old' signs. In ASL, changes have been noticed in the direction of increasingly abstract formational constraints, or a change from iconicity to the more arbitrary (Klima & Bellugi, 1979). For example, signs of the emotions, once located near the heart (Long, 1918), have moved to the more neutral location of the centre of the chest. Battison (1974) has observed an historical move toward symmetry, such that if both hands are active, they tend to be identical in configuration and are constrained in terms of place of articulation and movement. Symmetry reduces the complexity of the sign and creates more redundancy in the signal. Another change, reported by Klima & Bellugi (1979), is increased fluidity of signs; this involves

reducing a multipart sign to a single sign. Historically, INFORM was composed of KNOW (one-handed) and OFFER (two-handed). Over time the two parts have blended to form a smooth single sign.

### Restricted content

A common misconception about ASL is that it is limited to the representation of concrete ideas and lacks lexical and grammatical complexity. Studies of ASL have shown that some signs are in fact dependent on context for correct interpretation. For example, the sign CARRY depends on what is being carried. Bellugi & Klima (1975) point out that, within ASL, there is the possibility for expression at any level of abstraction. There is vocabulary for topics of interest including aspects of religion, politics, ethics, history and fantasy. In addition, original plays have been composed and performed entirely in ASL (Eastman, 1974).

Another indication that ASL is equipped to handle abstract concepts is the occurrence of intentional play on signs. Double meanings in ASL involve one of three processes: the blending of two signs, the overlapping of two signs, or the substitution of one regular ASL feature for another in the sign (Klima & Bellugi, 1975). For example, when a young deaf man was asked how he felt about leaving town for a new job, he expressed his feelings by simultaneously signing EXCITED and DEPRESSED. Ordinarily, each of the signs is made with two hands moving symmetrically. This signer made half of each sign with each hand, thereby indicating his ambivalence.

The misconceptions which allude to sign languages being intrinsically different from spoken language have been overturned by recent research. Numerous studies clearly demonstrate that ASL displays the same communicative functions, internal structure and complexity found in natural languages of the world. Owing to differences in modality of perception and production, however, ASL and other sign languages have some special features which are absent in spoken languages. It is to these unique features that the discussion will turn<sup>2</sup>.

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<sup>2</sup> While they are unique to sign language, these features have analogues in the various analytic levels of language.

## Linguistic Description of ASL

For a thorough description of the structural and grammatical characteristics of ASL, the reader is referred to works by Stokoe (1978), Klima & Bellugi (1979) and Wilbur (1979). For purposes of this report, several aspects of ASL that are directly relevant and important to the understanding of the current study will be reviewed. These features include (1) physical formation of signs in ASL, (2) lexicon, (3) morphology, (4) definition of a signed utterance, (5) syntax, (6) nonsign channels of ASL, (7) rate of signing, (8) signing space, and (9) discourse in ASL.

### Physical formation

Stokoe (1960) put forth the first structural description of ASL for which he coined the term "cherology." His units of analysis have been used in most research in the field. He posited that ASL requires three kinds of information about simultaneous events to specify any given sign and to distinguish it from other signs. The aspects he described are (1) location of the sign in relation to the body, called 'tabula' or 'tab'; (2) the handshape or configuration of one or both hands involved in the sign, termed 'designator' or 'dez'; and (3) the movement of the hands, called 'signation' or 'sig.' These aspects, which are discussed more fully in Stokoe's revised work reflect what acts (dez), its action (sig) and the location of the action (tab) (Stokoe, 1978). Motivation for this more general terminology arose from the necessity of recognizing the interrelatedness of the simultaneous events.

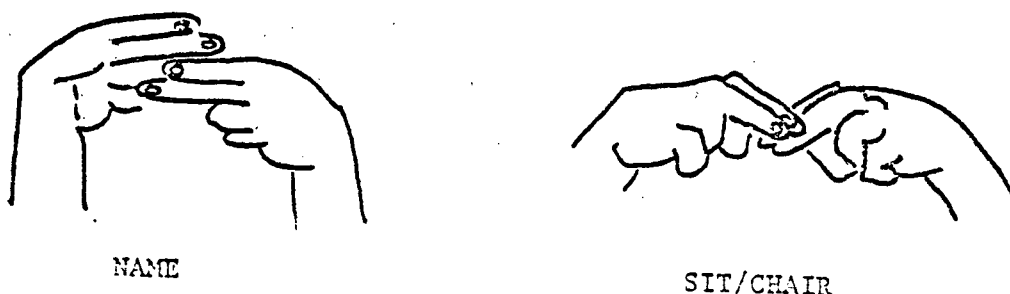
Description of what acts reveals the actual configuration of the hand or hands. Stokoe described 19 different handshapes, which correspond to the letters and numbers of the manual representation of English. For example, in the /C/ handshape the hand assumes the shape of grasping a ball, and the /F/ hand is made by contact of the tips of the thumb and index finger, with the other three fingers extended.

The action of the hand in three-dimensional space can be described in terms of vertical, horizontal and circular motions. Stokoe outlined 24 distinct movements, including motion toward the signer, as in BORROW, RECEIVE and ME; motion up and down, as in YES and JUDGE; and circular motion as in FAMILY, COOPERATIVE and SUNDAY.

Twelve locations of the hand's action were described. Examples of these locations are the lower face, as seen in the signs SOUR and GIRL, and the top of the shoulders, seen in ANGEL.

With these three aspects explicitly described and with a corresponding notational system, Stokoe was able to adequately capture the essence of the signs of ASL. Battison (cited in Stokoe, Casterline & Croneberg, 1965) added a fourth piece of information, referred to as 'orientation', which describes the spatial orientation of the hands in relation to each other or the body. Orientation can be used to distinguish between the minimal pairs NAME, and SIT/CHAIR (See Figure 2).

Figure 2. Orientation of the hands distinguishes between two signs which are identical in all other respects. (Adapted from Battison 1978:25).



What is important to note from the description of the formational characteristics of ASL is that the physical representation of each sign is comprised of discrete and measurable units. These units are roughly comparable to phonetic features of place and manner of articulation in vocal language. Note that this is a powerful argument against the notion that signs are iconic.

### Lexicon

Rule governed combinations of the four simultaneous aspects of signs result in the hundreds of signs found in ASL dictionaries. Comparison of signs that differ with respect to only one of these formational aspects (the 'minimal pairs' of traditional linguistic

analysis) has revealed families of signs that are related by similarities in the remaining aspects. For example, Frishberg & Gough (cited in Wilbur, 1979) show how certain signs are identical except for direction of movement. Examples of opposite pairs include APPEAR/DISAPPEAR, IMPROVE/GET WORSE. Another family is related by handshape, for instance, EXCITE, DEPRESS, FEEL, LIKE, TOUCH. Location of the sign is another feature that binds certain signs. For example, BOY, MAN and BROTHER are articulated at the forehead, while GIRL, WOMAN and SISTER are produced on the lower cheek.

The listing of commonly used signs in ASL does not imply that the set of signs is a closed one. New signs are added as the need arises. For example, initialized signs (which reflect a type of borrowing from English) are formed by representing the first letter of the English word as the hand configuration. Klima & Bellugi (1979) offer the example of the new sign MODULATION which was formed by retaining all the aspects of the sign CHANGE with the exception of the handshape; /M/ handshape for MODULATION was substituted for the original /A/ shape in CHANGE.

It is interesting to note that signs in ASL do not always correspond to words in English on a one-to-one basis. Signs in ASL sometimes require more than one English word to indicate the referent. For example, the meaning of the combined English words 'look at' is expressed by a single sign in ASL. Similarly, when the sign for 'walk' is accompanied by an upward direction, the translation of the single sign WALK-UP requires two English words. Conversely, some English words are translated by more than one sign, as in the compound BLUE SPOT, meaning 'bruise' or FACE STRONG meaning 'resemble'.

### Morphology

Wilbur (1979) discusses the morphological processes found in ASL, with the addendum that distinction between inflectional morphology (where markers are added to the basic sign) and derivational morphology (where the basic sign is modified in some regular manner) is difficult to determine clearly. For this reason no attempt will be made here to separate these types of morphological processes.

Directionality is an ASL morphological device whereby the

meaning of a proposition may be modified by a change in direction of movement. The directional movement is along a horizontal or vertical plane from the location of the source to the location of the goal (Edge & Hermann, 1977). For example, the verb LOOK can be marked for agent and beneficiary depending on where, relative to the sender, the sign is initiated. LOOK which begins close to the sender and moves outward to the receiver means 'I-look-at-you'; whereas, if the sender begins the sign close to the receiver and moves it towards himself, the meaning of the phrase would then be 'you-look-at-me.' Other verbs which operate similarly are INFORM and GIVE.

Another morphological process, also demonstrated in the preceding example, is incorporation, i.e. compacting information into a single sign. Agent-beneficiary incorporation is one possibility of reducing the redundancy of an utterance by overlapping two or more semantic categories. In the LOOK example, the agent, verb and beneficiary overlap in one sign. Other categories that lend themselves to incorporation are size, shape, manner, number and location. Incorporation of size is seen in BIG-HOUSE, where the sender signs HOUSE with an increased displacement of the hands, instead of the two separate signs BIG and HOUSE. An example of incorporation for shape is noted in the sign for 'remove' which depends on the physical shape of the object, e.g. a nail, a large painting or a small object from inside a box. Incorporation of manner can be seen with the verb WALK, which can be signed rapidly or slowly, meaning 'walk-fast' or 'walk-slow' respectively. Incorporation of number is possible, where the nondominant hand takes on the configuration of the number, as in TWO-WEEK. With incorporation of location, the relative location of an event can be signed simultaneously with the noun or verb sign, for example WALK-UP.

A third morphological process in ASL is reduplication, where a sign is repeated more than once. Reduplication marks a sign for plurality, iterative or durational aspect. For example, FRIEND FRIEND FRIEND means 'many friends' (Fischer, 1973) and SOLDIER STAND STAND STAND UNDER TREE means 'the soldiers stand under the tree' (Hoemann, 1978). Either the noun or corresponding verb signs can assume the marking of plurality. Frishberg & Gough (cited in Wilbur, 1979)

identified reduplication as a process that affects time nouns. For example, repetition of the sign WEEK with continuous brushing motion becomes WEEKLY and similarly MONTH to MONTHLY. Slow repetition, with added wide circular path indicates duration, so that WEEK becomes 'for weeks and weeks.' Fischer (1973) discusses this device as it applies to stative and nonstative verbs, to indicate aspect. She demonstrates that stative verbs, such as APPEAR or SEEM, must be repeated quickly, whereas active verbs DRINK, TALK and WIN can be reduplicated slowly or quickly. Slow reduplication is interpreted to mean that either the action was repeated over and over, such as 'winning and winning and winning' or that the action was continued for a long time, as in, 'talked for a long time.'

Another morphological process in ASL has been referred to as indexical reference, where a point in space is established for a noun sign. Once established, the signer can recall the referent by pointing to, or glancing at the predesignated spot without repeating the actual sign. This device is frequently used to assign a person to a location so as not to have to repeat that person's name each time it comes up in conversation.

Yet another process is reduction in form. A reduced form occurs when formation of a sign is simplified in movement, configuration or location. For example, THINK, which is usually made with the index finger touching the temple, can in conversation be produced in a more neutral location, several centimeters from the signer's head.

#### Definition of an utterance

Stokoe, Casterline & Croneberg (1965) define an utterance in ASL as the sign activity (or linguistically meaningful body activity) which occurs between positions of repose, where repose involves contact of the hands with each other, some part of the body, or an article of furniture. Other researchers (Covington, 1973a, 1973b; Grosjean & Lane, 1977) support this definition and claim that aspects of the period of repose can be revealing for purposes of determining constituent boundaries of signed discourse.

Covington (1973a, 1973b) identifies several characteristics of

the juncture between two signed utterances. She states that during the pause, the hands may be held in the location of the last sign and/or in the hand configuration of the last sign. This type of pause would indicate that the signer still has more to say, and would be relatively short in duration. By contrast, at the end of the conversation, the hands will fall to the signers lap, sides or piece of furniture, and remain there for a longer time.

Grosjean & Lane (1977) claim that close examination of pauses in ASL discourse can help determine the location of both major and minor constituent boundaries of an utterance. They demonstrated experimentally that a hearing nonsigner had no difficulty identifying and measuring pauses upon repeated viewing of videotaped ASL discourse. The subject was in agreement with the judges approximately 83% of the time. Grosjean & Lane found that the longest pauses in a signed story appeared at the boundary between two utterances, shorter pauses appeared between parts of a conjoined sentence and the shortest pauses appeared between internal constituents or lexical items.

### Syntax

Claims about sign order in ASL have been widely discrepant. An early position held by Tervoort (1968) was that ASL was weakly structured with great freedom of word order. He took one sentence, YOU ME DOWNTOWN M-O-V-I-E FUN? (translated as a request to go downtown to a movie) and presented in written form all possible permutations to teachers who were asked to judge them in terms of grammaticality. That none of the permutations was considered ungrammatical was taken by Tervoort as evidence that word order is free in ASL. Several problems are apparent which make the results of this study equivocal. Firstly, Tervoort asked non-native<sup>3</sup> signers to judge these utterances and secondly, the utterances were taken out of context.

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<sup>3</sup> Native vs. non-native signers. Not all users acquire sign language in the same manner. It is necessary in the study of this language to distinguish between native signers, who learn sign language as a first language from family members, and non-native users for whom formal signing was not the major means of early communication. A more complete examination of this issue can be found later in this chapter.

Fischer (1975) argues that ASL is basically a Subject-Verb-Object (SVO) language, like English, which developed in this way through the prevailing influence of the source language. Fischer presented sign sequences consisting of permutations of two nouns and a verb to native signers. From the signers' interpretations, she concluded that ASL is an underlying SVO language but qualified this by stating that "other orders are allowed under the circumstances that (a) something is topicalized, (b) the subject and object are non-reversible and/or (c) the signer used space to indicate grammatical mechanisms" (Fischer, 1975:21). Allowable departure from SVO order can be signalled by pauses, headtilts, raised eyebrows and other nonmanual cues, which Fischer terms 'intonation breaks.'

Friedman (1976) on the other hand, in her own analysis of discourse samples, found that SVO order was present but only infrequently. She claims that word order in ASL is free, but notes a tendency for the verb to be last. She argues for an underlying SOV order, consistent with the large number of OV constructions she found. The constructions resulted from subject deletion.

Kegl (1976) supports Fischer's view that ASL is an underlying SVO language and postulates a solution to the word order controversy: the Flexibility Condition, which states that the more inflected the verb is, the freer the word order may be. In view of this interaction between verb inflection and word order, one may find that if a verb is fully inflected for subject and object, signers may vary the order of the signs. In addition, the nonmanual cues may reflect an optional rule like topicalization, rather than a non-SVO order. This view is consistent with our knowledge about the relations between word order and degree of inflection in vocal languages of the world.

### Nonsign channels

The aspects of ASL structure presented so far primarily concern signs made by the user's hands. Baker (1976), Baker & Padden (1978), Liddell (1978) and others feel that the hands are not the only carriers of linguistic information. Baker suggests that there are five channels operating linguistically in ASL: the hands, the eyes, the face, the head and body posture. In other words, in any utterance, these channels

function simultaneously and continuously with all the previously mentioned features of ASL structure. For example, lexical items can include, as a formational feature, facial movements which mark negatives, interrogatives and relative clauses. Such overlap gives ASL a great potential for semantic redundancy. Except for the hands, these channels have not been exhaustively examined due to certain methodological considerations, e.g. an adequate transcription system and segmenting the components into discrete elements. However, it is relevant to the present study to outline some of the linguistic and paralinguistic functions of the four remaining channels.

The eyes. Baker (1976) suggests several functions of the eyes in an ASL utterance. She found that many signs never occur without movement of the eyes. For example for QUOTE and IMAGINE, the signer always looks up, and with SEARCH, the eyes look around as if actually searching for something. Closing the eyes has been used for emphasis, occurring, for example, with SLOW. According to Baker (1978) eye gaze can also serve to regulate turn-taking in ASL. A signer does not initiate a turn until the desired addressee looks at him or her. So, control of the floor can be maintained by avoiding direct eye contact.

Facial expression. Facial expression refers to the activity of the muscles controlling the mouth, nose, eyebrows, forehead, etc. Many manual signs require concomitant facial activity, just as others require specific eye movements. For instance, NOT-YET may be accompanied by a puckering of the nose and a sideways shaking of the head. ASL also has facial expressions which can be substituted for lexical items, such as adjectives or adverbs. The phrase 'big tree' may be produced with puffed cheeks plus the manual sign TREE. It has been found that puffed cheeks is a productive means of illustrating the magnitude of objects or events. Bellugi & Fischer (1972) and Stokoe (1960) have observed that although there are ASL manual signs of negation, a signer may negate a sign by frowning and lowering his or her eyebrows and shaking the head sideways. Baker (1976) demonstrates how facial expression can operate grammatically by comparing four variants which use the manual signs for REMEMBER THAT. (See Figure 3).

Figure 3. How facial expression assumes a syntactic function in ASL. Baker, 1976:27).

REMEMBER THAT	'I remember that'
REMEMBER THAT ← Neg → (brow squint)	'I don't remember that.'
REMEMBER THAT ← Q → (raised brows)	'Do you remember that?'
REMEMBER THAT ← Neg&Q → (raised brow squint)	'Don't you remember that.'

The head. The tilt of the head can operate as an adjective in ASL in 'big tree' vs. 'tiny tree' (Baker, 1976). In the former, the head was tilted backward while signing TREE, and slightly forward headtilt was noticed for the latter. Sideways shaking of the head has already been mentioned in connection with negation. In a study of ASL syntak, Liddell (cited in Baker, 1976) discovered that relative clauses are marked by specific head position and facial expression. He reports that during the signing of relative clause, the head is tilted backward, the eyebrows slightly raised and the nose is wrinkled.

Body posture. Aspects of body posture that have been found significant in transmitting linguistic information are forward and backward tilt of the body to indicate size (Liddell, cited in Wilbur, 1979), shoulder raised to indicated question or size (Baker, 1976) and actual change in inclination of the body from neutral to the left or to the right (Bellugi & Fischer, 1972). The shift in body inclination has been used to indicate various characters in a story, particularly to show who is speaking to whom.

#### Rate of signing

Rate of signing has been examined experimentally by Bellugi and Fischer (1972) where comparisons were made between the time needed to relate a story in English and in ASL. Results indicate that the two versions of the story contained the same number of propositions, had the same semantic content and took the same amount of time to produce.

A difference in modality was apparent with respect to the number of lexical units; 50% more words than signs were needed. The average rate of articulation was 2.4 signs per second and 4.7 words per second. The average rate for propositions per second was 1.3 for the signed story and 1.5 for the spoken story.

### Signing space

In ASL, articulation of signs is restricted to a particular space. In general, the hands do not extend above the head or below waist level, nor beyond the reach of the arms to the sides with elbows close to the body (Klima & Bellugi, 1979). Few signs occur at the limits of this space and only rarely do any signs exceed the normal limits. Violation can occur by amplifying the dimension of a movement, lengthening its path or widening the diameter of a sign. Namir & Schlesinger (1978) suggest that violation of the normal signing limits is a device used to intensify certain signs, thereby modulating their meaning.

### Discourse

In connected discourse, adjacent signs may influence each other, resulting in modification of one or both signs. The effect is similar to coarticulation effects in oral speech. Chinchor & Kegl (cited in Kegl & Wilbur, 1976) in a videotaped version of The Three Little Pigs noticed that the sign LET, usually signed at waist level, was signed instead at chest level in anticipation of the place of articulation of the next sign, ME. We can see that proximal elements interact in ASL as they do in oral language. In ASL, time and tense are not marked on the verb as in English, but are established at the beginning of a conversation and held until the time reference is changed. This is compatible with a view in the study of vocal languages that tense is a property of discourse rather than a property of sentences. Friedman (1975) specifies a time line which describes an arc beginning in front of the signers dominant side, touching the cheek and continuing behind the signer's head. The space in front of the body indicates present, slightly more forward indicates near future and far forward signifies very distant future. Similarly, past time is signalled in the space above the shoulder.

The preceding summary of the unique characteristics of ASL that originate from its designated modality of presentation supports the claim that despite superficial differences, ASL is fundamentally linguistically similar to other languages of the world.

### A Sociolinguistic View of Language

Consideration of the social dimensions of language has been posited by many researchers as an alternative to traditional linguistic analysis (Gumperz, 1964; Hymes, 1962, 1964a; Ervin-Tripp, 1964). Investigation of this type would assume a broader view of the process of communication and focus on "Who says what to whom, in what way and on what occasion?" Such analysis is the domain of sociolinguistics.

#### Traditional linguistic theory

... is concerned primarily with an ideal speaker - listener, in a completely homogeneous speech community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge in actual performance. (Chomsky, 1965:3).

Chomsky's proposed model of language, transformational generative grammar crucially distinguishes linguistic competence and linguistic performance. Linguistic competence is concerned with the underlying knowledge of language structure that is implicit in what the ideal speaker-listener says, but is not necessarily accessible by personal report. Transformational generative grammar attempts to explicate the knowledge that permits the individual to produce and understand an infinite set of sentences. Linguistic performance is concerned with the implementation and interpretation of speech events, and is not within the scope of this linguistic theory. According to sociolinguists, Chomsky's theory of competence postulates ideal speech events in abstraction, offering no importance to the social and cultural influences which may have determined their very existence.

Sociocultural dimensions that seem to be inextricably linked to speech events include characteristics of the people involved in a communicative interaction, the locale, the time and the topic of the interaction. Slobin (1971) argues that there has been lack of concern regarding the social setting as it influences language behavior, and

Goffman (1964) insists that characteristics of the social situation, until now "neglected", should be described in detail. This situation has been remedied to some degree in recent years, although transformationalists have not redefined the scope of their linguistic enquiry. Sociolinguists do not argue that traditional linguistic theory is no longer relevant, but rather that the sociolinguistic data might be linked in some way to the existing theory, and may incite some changes in the theory. For,

...just as transformational theory could absorb predecessors and handle structural relationships beyond their grasp, so new relationships, relationships with an incredible social component, will become salient that will require a broader theory to absorb and handle them. (Hymes, 1971:273)

Hymes (1971) proposed the term "communicative competence" as the focus of this broader sociolinguistic theory. Communicative competence encompasses (1) underlying knowledge of social appropriateness as well as (2) underlying knowledge of grammatical structure. Relevant factors include attitudes, values and motivations related to all aspects of language, and the interaction of language with social and cultural norms. Acquisition of such competence is a function of the socialization process. The child is exposed to linguistic input in the context of social interaction rather than adjacent to it. The knowledge of which Hymes speaks is vast, gathered from the experience of every social situation that the speaker enters. Goffman (1964) finds it hard to imagine a social variable that does not have even a slight affect on speech. Members of a particular speech community, then, have internalized the rules of grammar and appropriateness of speech that are shared by other members and that govern their speech behavior.

Phenomena which emerged through investigation of the interaction of sociocultural and linguistic events have become the core of sociolinguistic data. Description of the nature of these phenomena is abundant and diverse, covering issues such as: diglossia, a situation where two or more varieties of the same language are used by the same speaker under different conditions (Ferguson, 1964b); "baby-talk" modifications in language that an adult implements when addressing a young child (Berko Gleason, 1973); terms of address, connoting intimacy or condescension (e.g. French tu), formality or reverence

(e.g. French vous) (Brown & Gilman, 1960); and the use of an intimate, casual or formal style of speech when addressing participants of various ages, social statuses or occupational roles (Joos, 1964). Hymes, making note of the pervasiveness of sociolinguistic phenomena states that

No normal person, and no normal community, is limited to a single way of speaking, to an unchanging monotony that would preclude indication of respect, insolence, mock seriousness, humor, role distance and intimacy by switching from one mode of speech to another.  
(Hymes, 1972:38)

A closer examination of this statement will clarify some of the fundamental characteristics of a "broad" view of communication.

The community to which Hymes refers is the speech community, an aggregate whose members share at least a single speech variety, as well as knowledge of the constraints which govern its appropriate use. The community is characterized by regular interactions among members in which social relationships are established and maintained. The rules of appropriateness must be shared, so that members can both encode and decode the social meaning in their messages. For example, the English speaking community in Quebec constitutes one speech community, while a group of automobile mechanics working at the same garage constitutes another.

Hymes gives several examples of different ways of speaking, which within a particular speech community constitute a verbal repertoire. This repertoire contains all the acceptable ways of formulating messages, that is, the totality of linguistic forms regularly employed in the course of communicative interaction among members. Varieties in the repertoire carry alternatives of lexical, semantic, syntactic, phonological and paralinguistic features. To indicate respect, for example, a member would consider the alternates and choose the ones which conventionally signal his intention. In this case the form the message takes may be slower than normal rate, lexically and syntactically more complex, precisely articulated and/or controlled in intonation. It is important to remember that the composition of the repertoire will be different for different speech communities and that not all members of a community have access to all varieties in the repertoire. Hymes coins the term "differential

competence" to account for two members of a speech community whose knowledge and use of available varieties differs. An example is provided by Bloomfield, who described the language of two members of the Menomini. The first was a man of forty whose use of Menomini was "atrocious." He used a small vocabulary, few inflections and only few sentence constructions. The other was a woman who spoke a "beautiful and highly idiomatic Menomini" (Bloomfield, 1927:394).

Having established the notions of speech community and verbal repertoire, we must now consider the communicative situation itself. The situation refers to all the elements of social and linguistic importance that surround the communicative interaction. Formally, the components include: participants--sender(s) and receiver(s); channel--spoken, written or sign language; code--linguistic and/or para-linguistic; setting--locale in which the action occurs, e.g. the home, on a bus, in a television studio; form--structural characteristics of the code; and topic--the subject matter of the interaction (Hymes, 1962, 1964a; Ervin-Tripp, 1964, 1969). Focus on any one of these components would reveal the relevant features of that component and the range of possible alternatives. In addition, the relationship between components can also be investigated. For example, we might ask what topics of conversation would be expected from certain participants and what would happen to the topic if one of the participants was replaced by another individual? Such a comparison would help describe the rules of communication by illustrating specific features of the social situation that can trigger a change, in this case a change in participants.

In order for the speaker to be effective in a communicative interaction, he must be able to evaluate the social variables present and on this basis select from his repertoire of alternate forms that which will not only be appropriate, but also match his communicative intention. The ability to select from among the alternates is known as "code-switching" or "style-switching." The latter term posited by Joos (1967), will be used in the remainder of this report.

Several methods have been employed to investigate style-switching. In attempting to establish correlations between linguistic and sociocultural variables, the sociolinguist must only only demonstrate that altering the components of the interaction will yield

linguistic variation, but also show that much of the variation is systematic. In terms of description, studies attempt to show when, how and to what extent speakers modify their speech as a function of particular variables in a given social context. In terms of explanation, studies are designed to establish the norms and rules of a given speech community. According to Hymes (1974), analysis of sociolinguistic data will help to establish the rules of communication. He suggests that first, one should identify the components of an interaction and second, one should discover the relationship between these components. It is within this framework that several important aspects of the sociolinguistic literature will be reviewed.

### Participants

That speakers possess a broad communicative competence which permits them to use grammatically correct and socially appropriate forms of language has already been established. What this competence entails can be exemplified by focussing on one of the components of the situation, for example, the participants in a two-way face-to-face interaction.

In any act of communication, there is a "sender" and one or more "receivers" who together may be called "interlocutors" (Hymes, 1962). The sender is the person whose turn it is to convey some information. The receiver is the audience and provides the feedback which shapes the sender's output. It can be expected that the relationship between sender and receiver is reciprocal, for instance, doctor-patient or teacher-student. Every individual has a number of social identities, each with a prescribed allocation of rights and duties (Goodenough, 1965). Some identities are ascribed by virtue of a person's age, sex and/or racial origin. Other identities are achieved, for example, profession, acquired skill and/or social status. Social status characterizes a participant's relative social standing. In a two-way interaction, the sender may adopt superior or inferior standing. Gumperz (1972) states that the features of status and role are not permanent qualities of speakers, but rather abstract communicative symbols. Indeed, these attributes mark important social information that must be considered in both the encoding and decoding of messages. It seems that communicatively competent speakers use these

symbols to create a controlled impression (Edwards, 1976). That people can and do decode the social import of a message has been established by Lambert (1976). Goffman (1964) points out that rather than the attributes themselves, it is the value placed on these attributes that is considered in a communicative interaction.

Selection of a given identity depends on the nature of the social situation--what the activity is, where it takes place, who else is in attendance, the purpose of the interaction. For example, a man can assume the role of doctor in his office, or consumer when he brings his car to a garage to be serviced. In either situation, this person is cognizant of his rights and obligations. The sender, when selecting the form of the message from his or her repertoire, anticipates the qualities of the person who is to receive that message.

The effect of relative social status of the sender and receiver has been outlined by Brown and Gilman (1960) in their study of forms and address. They show how the use of pronouns in French, Italian and German is dependent on the social relationship between interlocutors. In this study, reciprocal and nonreciprocal usage of the respectful vous and familiar tu (and corresponding terms in Italian and German) is demonstrated. In nonreciprocal usage, one of the participants, the social superior, addressed the other with tu and in return is addressed with vous. In reciprocal usage, both members use the same pronoun, tu to express intimacy and solidarity, and vous to indicate a degree of formality. Ervin-Tripp cites the example of the utterances of technicians in a university medical laboratory:

J.J. Hey, Len, shoot the chart to me, willya?

A.D. Oh by the way, Doctor, could you leave that chart when you're through.

In this example, J.J. took the option of using an informal address form and speech style when conversing with a physician. In contrast A.D. chose a more formal and rank-marked style (Ervin-Tripp, 1976:32).

### Code

Code may be defined as a systematic set of signals which co-occur in a particular setting. It is the collection of structural components that comprise a language or variety of a language that would be appropriate in a given situation (Ervin-Tripp, 1964). For example, Gumperz (1961, 1962) distinguishes between vernacular, the speech used in the home, and superposed variety, the norm in other social

situations. Variation in code can be broken down into changes that occur at the phonological, lexical, syntactic and paralinguistic levels of language.

Joos (1967) outlines five styles of discourse in English which correspond to particular situations and which are characterized by a certain set of linguistic and paralinguistic features. These five styles reflect the formality of a situation ranging from intimate, casual and consultative to formal and frozen. Each style has a "code-label", a list of conventions that serves to identify it. For example, consultative style has two defining features. First, the sender supplies adequate background information in the content of his or her message, and second, the addressee participates continuously in the interaction. Code labels would include receiver insertions like, "Oh, I see," or "That's right." Casual style is reserved for friends and insiders and is characterized by an absence of background information and no reliance on receiver participation. Ellipsis and slang are two features which serve to signal this style. The most obvious defining feature of formal style is the lack of receiver participation. This may be due to the size of the group that the sender is addressing, who is being addressed or perhaps the purpose of the interaction. For instance, conversation between strangers usually begins in formal style. Code labels include may, as in "May I help you?", one (instead of I, me, my) as in "One finds in the literature...." In the formal frame, the text is usually organized or practiced and presentation is fluent, with precise pronunciation and elaborate grammar. Frozen style is found mostly in written material where the participants are likely to remain strangers, as in a novel. Intimate style, which excludes all public information, aims at reminding the addressee of some feeling that the speaker has by extracting some pattern from a previous stated casual sentence. The message meaning in this style is often conveyed by intonation. These five styles represent ways of speaking that are directly linked to specific situations. An essential point of Joos' thesis is that style-switching appears in the language of monolinguals, who switch between varieties of a single language.

Labov's research in New York City revealed a speech community whose members exhibited systematic style-switching at the phonological level. Evidence came from recording the frequency of occurrence of

five phenomes, for example, the frequency with which the final or pre-consonantal /r/ was pronounced in words like guard, bare and beer (Labov, 1966). Results indicated that use of /r/ correlated with specific aspects of the social situation. That is, frequency of occurrence of particular phonemes correlated with occupation, ethnic group and socioeconomic status. Labov also found that phonological variation was closely tied to the formality of the situation, i.e. /r/ occurred less frequently in casual speech and more frequently in formal contexts.

A large part of the vocabulary of any given code is shared by all its speakers, but there are also certain sets of lexical items restricted to the speech of certain groups within a speech community (Laver & Trudgill, 1979). Access to a particular variety reflects common interests, experience or occupation of the participants; technical vocabulary is usually confined to those who specialize in the particular topic. Minority groups are known to have developed special vocabularies which reflect similar interests as well as reinforce group cohesion. Use of slang or colloquial terminology is a powerful social marker, often related to age of its users. Use of outdated slang also serves to identify speakers.

One style that has been intensely investigated is one frequently called the "baby talk register".<sup>4</sup>

In the earliest discussion of baby talk register, Ferguson (1964a) claimed that in many cultures, including Arab, Comanche, English and Spanish societies, there is a style of speech characteristics of adults addressing infants. The formal features of this style include a change in lexicon, simplification of grammar, formation of words by reduplication, simplification of consonant clusters, general labialization and a rise in fundamental frequency of the voice. Examples of lexical alternates in English baby-talk style are words like bunny, night-night and bye-bye, which are modified versions of adult forms (Ervin-Tripp, 1969). Baby-talk in some languages, Berber for example, possess a much greater separate lexicon than does English baby-talk (Bynon, 1977).

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<sup>4</sup> This register in English has been described and discussed in great detail. See Andersen's annotated bibliography (Snow & Ferguson, 1977).

Both Hymes (1974b) and Crystal (1971) direct our attention to paralinguistic features which may identify certain speakers in particular situations. Variation may occur in level of pitch, high or low; vocal quality, breathy or clear; volume, soft or loud; and/or speech rate, slow or fast. Reduction in rate of speech and increase in level of pitch are features which have been identified in adults' speech to children (Ferguson, 1964, 1977; Andersen & Johnson 1973; Berko Gleason, 1973), nurses' speech to hospital patients and speech addressed to foreigners (Snow & Ferguson, 1977).

From the review of two components of the communicative interaction, participants and codes, and the relationship between these components, we see the existence of an underlying system governing the choice of alternates in a repertoire. Furthermore, we can see that not all combinations of codes and participants can occur.

#### A Sociolinguistic View of ASL

Discussion so far has focussed on the nature of style-switching as it pertains to spoken languages of the world. Researchers have also presented evidence supporting the existence of style-switching in ASL (Stokoe, 1973; Woodward, 1971, 1973; Cicourel, 1978). In accordance with Hymes' (1974) paradigm for establishing the rules of communication, investigators have successfully identified the components of ASL communicative interaction and described, albeit anecdotally, the relationship between the components. Discussion now turns to these investigations.

#### The deaf linguistic community

The "speech community" itself takes on an extended meaning in ASL. Deafness, more than just a physical phenomenon "...is a cultural phenomenon in which social, emotional, linguistic, and intellectual patterns and problems are inextricably bound together" (Schlesinger & Meadow, 1971:1). Deaf individuals who so choose consider themselves members of the deaf community. Their common language, ASL, is one of the central cohesive elements of the group. Cicourel and Boese (1972a, 1972b), Stokoe (1960, 1978) and others point out that not all individuals within the deaf community acquire ASL in the same manner. Differences in the circumstances of ASL acquisition mark the difference

between native signers and non-native signers. The native signer is one who learned ASL as a first language, i.e. during childhood from deaf family members. This person was therefore able to "learn various subtleties of signing...and relies on them for communicating intimacy, emotion, sublety, double meaning...which a second language signer would have great difficulty acquiring unless he spends a considerable amount of time among the deaf" (Cicourel & Boese, 1972:32). Furthermore, the native signer is likely to use varieties of ASL which do not correspond to English syntax, while the non-native signer would typically rely on English structure. Meadow (1972) outlines three periods in the life of a person that may mark his or her entrance into the deaf community: (1) infancy, when "the milestones in sign language acquisition parallel the milestones in spoken language acquisition" (Schlesinger, 1971:206), (2) the time of enrollment in a residential school for the deaf, where the child may learn sign language from peers, and (3) the time of graduation from high school when the individual must communicate functionally in the community. Some hearing people also gain entrance to the deaf community--those whose parent(s) or other family member(s) are deaf, a person married to a deaf spouse, a teacher or individual working with the deaf.

#### Participants in ASL communicative interaction

The distinction between native and non-native signers is an important one because it constitutes part of each participant's social identity, which as we saw earlier determines his relative social status. Kantor (cited in Wilbur, 1979) demonstrates that signers (native and non-native) are able to identify other signers as native or non-native. Cues which influenced their decisions were hands, rhythm of signing, kinds of signs, facial expression, body movement, location of signs and fingerspelling. Lunde (cited in Stokoe, 1978) outlines social characteristics that distinguish between the deaf and hearing person. It seems clear that some of these aspects serve to differentiate between members of the deaf community as well. The relevant social role aspects include: language (as noted above); level of education (few deaf people obtain high school certificates and even fewer attend college or university); social class; occupation and income. As explained earlier the social identity of each

participant in an interaction is in part responsible for the nature of that interaction.

### Code

A number of studies have demonstrated that varieties of ASL exist. Stokoe (1970, 1973) using Ferguson's (1959) paper on diglossia as a model, demarcates High and Low versions of ASL and Manual English, where Manual English refers to the combination of signs and finger-spelling that represents a morpheme to morpheme correspondence with spoken English. He proposes a two-dimensional continuum, extending from formal and informal Manual English to formal and informal ASL. Within this continuum, signers have several varieties available to them for different communicative contexts. For example, the High variety, which is on the Manual English end of the continuum would be used in a church sermon or a university lecture, while the Low variety, ASL, would be found in conversation with family and friends. These particular contexts reflect variation based on the formality of the situation. On the other dimension, the range extends from "home signs," developed and used by small groups when not in contact with other groups, to standardized lexicon, syntax and formational aspects of sign language. Style-switching within Manual English or ASL is consistent with what we know about the influence particular settings or participants have on the form of the message in vocal languages.

Woodward (1973a, 1974) describes Pidgin Signed English (PSE) which refers to intermediate varieties of sign language along the continuum from ASL to Signed English, where the syntactic order may be close to English, but inflections and other structures have been modified. Woodward investigated the application of three syntactic and morphological rules -- agent-beneficiary incorporation, negative incorporation and verb reduplication -- and found an implicational hierarchy. Those varieties which are considered most Englishlike, have fewer incorporations and reduplications than those more ASL-like, which allow for a wider range of application of these rules. Woodward (1973b) found that variation between varieties is significantly correlated with four variables related to social identity of the participants. These variables include: (1) whether or not the signer is deaf, (2) whether or not the signer has deaf parents, (3) whether or

not the signer has college experience (applicable to deaf signers only). Results indicate that one is likely to find a deaf person, a person with deaf parents and a person who learned signing before six years of age using varieties that approach ASL. Conversely, one is more apt to find a hearing signer, a signer with hearing parents and a person who learned sign language after age six using varieties that do not closely resemble ASL. Another observation about PSE is that it is signed in a more restricted and more centralized signing space and with considerably less facial expression (Woodward & Markowicz, cited in Wilbur, 1979).

The varieties along the ASL-Signed English continuum reflect the linguistic tenet that languages in contact influence each other by borrowing forms and/or structures. In the case of English and ASL, however, the relationship is one-sided. While ASL borrows linguistic patterns from English, ASL has an insignificant effect on English. Bragg (1973) acknowledges the influence of English on ASL in his discussion of Ameslish. He feels that it is a combination of ASL and English that gives a realistic picture of the communication process carried on by deaf people in the United States. Furthermore, consistent with Stokoe and Woodward, Bragg feels that the level or style of Ameslish a signer uses depends on the situational context.

### Style-switching in ASL

Further to the revelation that within the repertoire of the deaf community members, there exist distinct varieties of ASL, studies have revealed evidence of style-switching. Meadow (1972) observed style-switching in a 2 1/2-year-old hearing child, son of an educated deaf man and a hearing woman. A 15-year-old deaf foster sister, who lived in the home, used a less Englishlike variety of ASL. The child was seen to switch from an Englishlike variety of ASL with his father to spoken English with his mother to the less Englishlike variety of ASL with his sister.

Erting (1978) witnessed style-switching in a preschool class for the deaf where eight deaf children and two teachers utilized at least two language varieties, switching according to the formality or informality of the situation. The deaf teacher's aide and the children used a formal signed English during an activity where specific English

constructions were being taught. In the same manner children's requests during unstructured activities were more casual and ASL-like than question forms observed during a structured time, the latter being more Englishlike.

A study by Cicourel (1978) explored style-switching of four native signers using British Sign Language (BSL). Each signer was required to tell the same story to the next signer until the fourth person signed it back to the first signer. In actuality, the first signer produced the story to each of the others. From the videotape, changes in the iconic form of the signs were noticed as the key subject altered his production in accordance with his perceptions of each receiver in turn. The different editions were said to range from a highly Englishlike variety of BSL to a more BSL-like variety. Changes included lexical, syntactic and semantic simplification and elimination of fingerspelling.

Studies of style-switching in ASL (or BSL) have intended to provide: (1) an account of different varieties of ASL which form the continuum from ASL to Signed-English, (2) a profile of the social aspects of the interaction that elicit one of the many varieties, (3) detailed reports of when style-switching was noticed, and (4) in the case of Cicourel's investigation, what aspects of BSL were varied in the self-editing procedure. In reality, these studies have barely scratched the surface in establishing significant correlations between the linguistic features of sign language and the social aspects of signed interactions. There are several questions which have yet to be systematically investigated. The most glaring gap in the studies described above concerns identification of the specific formational characteristics of ASL that vary from situation to situation. There is clearly room for a detailed investigation of the aspects of the code at formational, lexical, syntactic and paralinguistic levels of ASL as they interact with each of the other components of the communicative situation, such as setting, topic and formality. An inquiry of this nature would delimit rules of communication in ASL and expand upon what is now known about the language of the deaf.

### Statement of the Problem

The claim of the present investigation is that users of American Sign Language modify their signing systematically, in response to variation of elements in the social situation. Furthermore, the systematic modification occurs at most of the linguistic and paralinguistic levels of ASL.

Review of the relevant literature has demonstrated that such modification, or "style-switching" is a phenomenon manifested by competent users of natural languages of the world. It has also been established that ASL can be and is considered a natural language of the world. It follows then, that competent users of ASL will exhibit systematic style-switching as a function of characteristics of the social situation.

To show that this is the case, this study will examine and compare linguistic and paralinguistic features of a native ASL user's signing under different social conditions; that is, it will focus on the interrelation between code and participants. It is not within the scope of this preliminary study to determine if the effects of manipulating these sociolinguistic variables are systematic. The first step is to firmly establish the existence of style-switching by providing organized evidence of formal parameters of ASL that vary and suggesting what social variables triggered the variation.

## CHAPTER 2

### METHOD

#### Selection of the Participants

The principal subject, G.Y. who acted as sender, was selected as a native signer. G.Y., a 32-year-old male, was born with a profound bilateral hearing loss. Although his parents were not deaf, G.Y. acquired ASL from deaf family members prior to six years of age. He attended Gallaudet College and has been teaching in a school for the deaf. His primary source of communication is ASL.

The other five participants, who acted as receivers, were chosen on the basis of their social status relative to the principal subject. Each sender-receiver pair represented a unique relationship. All receivers were familiar to the principal subject prior to the investigation. A brief description of each of the receivers follows.

(1) D.A., a 26-year-old male, has had a severe hearing loss since birth. He learned ASL after six years of age, attended university and has been teaching at a school for the deaf. D.A. uses oral speech as his primary means of communication.

(2) S.E., a 37-year-old female, has had severe hearing loss since birth. She acquired ASL after six years of age. S.E. is a teacher's aide at a school for the deaf and uses ASL as her primary means of communication.

(3) E.I., a 35-year-old female, has had a severe hearing loss since the age of ten months. She acquired ASL from friends after six years of age. E.I. attended university and has been teaching at a school for the deaf. She uses both oral speech and ASL as means of communication.

(4) B.U. is a 52-year-old male, with a profound congenital hearing loss. He acquired ASL from family members prior to six years of age. B.U. has been a counselor at a community centre for the deaf, and uses ASL as his primary means of communication.

(5) H.O., a 13-year-old female, has had a profound hearing loss since birth. She learned ASL at school before she was six years old. She has been attending a school for the deaf and uses ASL as her primary means of communication.

The assumed relationship between the sender and each receiver in terms of social status is shown in Figure 4. The six participants are ranked from highest to lowest on the basis of age, occupation and assumed command of ASL.

Figure 4. Ranking of the six participants in terms of age, occupation and command of ASL. (The sender's initials are underlined.)

<u>Rank</u>	<u>Age</u>	<u>Occupation</u>	<u>Proficiency</u>
Highest	B.U.	B.U.	B.U.
	S.E.		<u>G.Y.</u>
	E.I.	<u>G.Y.</u> , E.I., D.A.	E.I.
	<u>G.Y.</u>		S.E.
	D.A.	S.E.	D.A.
Lowest	H.O.	H.O.	H.O.

#### Selection of the Tasks

Two well-structured tasks, a paraphrase task and a puzzle task, were selected for presentation to each of the five receivers. The introduction to each of these main tasks was counted separately as an instruction task. A question task was added to elicit receiver participation. The instruction task was low in structure, i.e. the sender was at liberty to generate both form and content of the message. The schedule of tasks was the same for all receivers.

- (1) Instruction 1
- (2) Paraphrase 1
- (3) Question 1
- (4) Paraphrase 2
- (5) Question 2
- (6) Instruction 2
- (7) Puzzle task

#### Paraphrase task

The theme of a short story found in the 1955 edition of A Treasury of Humor and Toastmaster's Handbook was modified to increase its contemporary appeal. The story was selected because it contained a

wide range of linguistic components that would require a signer to use a variety of structural modifications of ASL. The story appears in its English version in Appendix B.

The sender was given a copy of the story to review two weeks before he was required to present it to the receivers. He was informed that he was not to memorize the story, but rather to become familiar with it so that he could paraphrase the content on presentation. The story was divided into two parts at a logical break in the plot. This interval provided the opportunity for receiver participation, and will be further delineated in the description of the Question Task.

#### Puzzle task

In this task, the sender was required to guide the receiver through instructions which led to completion of a puzzle. The puzzle was a Soma cube, a set of plastic blocks representing different possible combinations of four small cubes which, when arranged correctly, formed a three inch cube. Each shape was painted one of three colours to aid the sender's description. The sender was given the key to completion of the puzzle two weeks prior to the presentation so that he could become familiar with the prescribed method of constructing the cube.

#### Question task, 1 and 2

Two questions were inserted into the Paraphrase Task in order to create a more communicatively natural interaction. The element of turn-taking ensured that the sender would have an active partner, thereby relieving him of some of the communication load. In addition, reversing the role of sender and receiver allowed the original sender to confirm or readjust his hypothesis regarding his partner's proficiency and style of signing. Sample questions were provided for the sender, but he was free to alter them. Each question was to address the preceding segment of the story. The receiver-turned-sender was required to respond in ASL to the question. The sample questions appear in Appendix B.

#### Instruction tasks, 1 and 2

In this task the sender was asked to explain to the receiver the nature of the interaction and the roles that each of them would

adopt. For example, in Instruction 1, the receiver was told that he or she would be required to watch the story that the sender would sign and to answer two questions, one in the middle and one at the end of the story. In Instruction 2, the receiver was told that he or she would be asked to manipulate the pieces of the puzzle while following the sender's instructions. The content of Instructions 1 and 2 was not formally provided for the sender. He was encouraged to explain in his own words what would transpire in the session. In contrast to both the Paraphrase and the Puzzle Tasks, Instruction 1 and 2 were expected to elicit more widespread variation in both form and content.

### Collection of the Data

Five sessions were arranged in a recording studio where each dyad, sender and receiver, was videotaped separately. The sessions were planned so that the sender signed the complete program (seven tasks) to each receiver in one sitting. The order of presentation was as follows: G.Y. the principal sender signed to (1) D.A., (2) S.E., (3) E.I., (4) H.O., and (5) B.U.

The participants were brought into the studio and given their positions, while the crew arranged the cameras. Each participant sat in a low-backed chair separated by a distance of four feet. The chairs were oriented so that the participants were facing each other squarely. Two Ampex Black and White, 1" plumbicon studio cameras were focussed on the participants, one providing a straight-on view of the sender, the other providing a straight-on view of the receiver. The representation from both cameras encompassed the complete range of the signing space of the two participants. All the filming was controlled by an experienced producer from a booth adjoining the studio. The two camera views were arranged on a diagonally split-screen. All five sessions were taped on a Sony 8650 1/2" VTR. The investigator, who was present in the studio during all sessions, cued the principal signer to begin.

Following the collection of all the data, the original tape was dubbed onto a JVC Cassette using a Richmond Hill 2004 Video Switcher and a Panasonic NV8310 VHS Video-Cassette Recorder. A video digital time clock generator was used during dubbing to insert, in the bottom of the picture, a digital account of the time of each session in minutes, seconds and 100ths of seconds.

### Transcription of the Data

Each session was viewed on a 19" television monitor which was connected to a JVC HR6700U Video Cassette Recorder. The playback mode was equipped with a slow-motion control which enabled the viewer to alter the speed of the tape.

Each signed segment was transcribed separately by the principal transcriber, a congenitally deaf university student who uses both ASL and oral speech in daily communication. The transcription included five main components: (1) An ASL-to-English literal transcription of each sign was made using part of the notational system outlined in Klima & Bellugi (1979). See Appendix A. (2) The boundaries of each signed utterance were identified by specifying the nature of the pauses in the corpus. A notational system based on Covington (1973) was adopted for identification of the pauses. See Appendix A. (3) The duration of each utterance, measured to the nearest tenth of a second was recorded. (4) The duration of the pauses between utterances, measured to the nearest tenth of a second was recorded. (5) An English gloss was provided for all signed utterances.

The principal transcriber viewed each session, segment by segment. She approached the task by trying to locate the general meaning of the signs, and then proceeded to establish utterance boundaries and provide the literal transcription and English gloss. Periodic reliability checks performed by the principal investigator included utterance and segment transcriptions and juncture comparisons. Agreement between the principal transcriber and the investigator on the ASL-to English transcription and utterance boundaries was greater than 90%.

### Analysis of the Data

From the literal transcription, each utterance was examined for evidence concerning the following seven performance parameters:

(1) Lexicon - counts were made of the number of different signs and fingerspelled words and the total number of signs and fingerspelled words present in each utterance<sup>5</sup>. A type:token ratio was calculated

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<sup>5</sup>For the remainder of this report, reference to number of different signs and number of total signs will also include the number of fingerspelled words.

on the basis of these two measurements to determine flexibility in choice of lexical items.

(2) Morphology - The number of incorporations, reduced forms and indexical references were counted in each utterance. The raw numbers were then converted to a percentage based on the total number of signs.

(3) Syntax - Calculations were made of the total number of utterances, number of propositions or different ideas in each utterance, number of signs per proposition, and the number of repetitions per utterance. Repetitions included exact duplication of lexical items and/or phrases, but not restructuring of an idea.

(4) Rate - Measurements were taken of the total duration of each utterance to the nearest tenth of a second, both with and without pauses, as well as the duration of pauses between utterances. In addition, the number of signs per second and the number of propositions per second were calculated.

(5) Headtilt - Counts were made of the total number of headtilts present in each utterance including head tilts forward, backward, to the signer's left and to the signer's right. Percentages of the direction of the headtilt per total number of tilts were calculated.

(6) Body Movement - Counts were taken of the number of shoulder raises, the number of body turns; from a neutral position to the signer's left and/or right, and the number of complete changes in body inclination; from the left to the right and/or from the right to the left.

(7) Amplitude - The number of times the signer's hands extended beyond the normal signing area were counted.

Two additional parameters; facial expression and eye gaze were planned for inclusion in the analysis. However, the representation on videotape did not allow for a clear view of the facial area of the participants.

In addition to counts, percentages and proportions based on each utterance separately, scores for each performance parameter were grouped by task and by receiver. Means and standard deviations were derived for each performance parameter across receivers, for each task separately. Task scores for each receiver were then compared to the mean.

The analysis yields the following information: (1) identification of variants within each of the seven ASL performance

parameters, (2) an explicit account of the nature of linguistic and paralinguistic variation across tasks and across receivers, and (3) an indication of how observed variation relates to the social characteristics of the receivers.

### Hypotheses

#### Task variables

It was felt that differences between tasks would disclose elements of ASL that characterize formal and informal signing. For example, utterances in the Instructions (form and content established by the sender) might have a higher type-token ratio for lexical items, more propositions per utterance, a faster rate of production and less use of the non-sign channels than the more formal Paraphrase. Furthermore, differences may arise between parts of the Paraphrase due to semantic content of the segments and/or a change in the sender's hypothesis regarding the receiver's proficiency in ASL.

#### Receiver variables

It was predicted that each of the social variables, age, occupation and assumed proficiency in ASL, would contribute to a differential profile based on the amount of use of each performance parameter. In general, the expected profile for each receiver may be characterized as follows:

- (1) Lexicon - From highest to lowest ranking receiver, there will be an increase in the total number of signs used and a decrease in the type:token ratio.
- (2) Morphology - From highest to lowest ranking receiver, there will be a decrease in the use of all the morphological devices.
- (3) Syntax - From highest to lowest ranking receiver, there will be a decrease in number of propositions per utterance and number of signs per proposition, and an increase in number of repetitions per utterance.
- (4) Rate - From highest to lower ranking receiver, there will be an increase in duration of utterances, and a decrease in number of signs per second and number of propositions per second.

(5) Headtlt, (6) Body Movement, and (7) Amplitude - From highest to lowest ranking receiver, there will be an increase in the use of all elements.

## CHAPTER 3

### RESULTS AND DISCUSSION

#### Introduction

For this thesis, data from three of the original seven tasks were analyzed: Instruction 1 (task 1), Paraphrase 1 (task 2), and Paraphrase 2 (task 4). Uninterpreted counts of each of the performance parameters defined in Chapter 3 are tabulated in Appendix C.

Results are presented by sign and nonsign performance parameters. While the emphasis is on receiver variables, task differences are also discussed. Following this, results are summarized according to receiver variables, and then according to task. In all tables Receivers are listed (from left to right) in order of presentation by Sender.

#### Performance Parameters

##### Lexicon

The total number of signs signed by the Sender<sup>6</sup> to each Receiver in each task is shown in Table 1. The total counts across tasks show that the Sender signed the most individual signs (tokens) to H.O., the lowest ranked Receiver on all three variables of age, occupation and signing proficiency (see Figure 4), and the fewest signs to E.I., who is adjacent to or equal with the Sender on all three variables. Total signs presented to H.O. and E.I. were, respectively, well above and well below the mean number of signs, while total signs presented to D.A., S.E. and B.U. were not far from the mean. The extent and direction of the difference from the mean for H.O. and E.I. was maintained in each task.

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<sup>6</sup> In this chapter, Sender and Receiver are capitalized on analogy with Speaker and Hearer in discussion of speech acts.

Table 1. Total Number of Signs (Tokens) Used by Sender to Each Receiver in Each Task.

Task	Receiver					$\bar{X}$
	D.A.	S.E.	E.I.	H.O.	B.U.	
Instruction 1	26	47	26	52	42	38.6
Paraphrase 1	66	60	51	79	66	64.4
Paraphrase 2	78	82	70	81	75	77.2
Total Across Tasks	170	189	149	212	183	180.6

Table 1 also shows that the Instruction task was considerably briefer than Paraphrase 1 or 2. This simply reflects the nature of the tasks: Instruction 1 informed the Receiver that a story would be told and a question would be asked, while Paraphrase 1 and 2 constituted the story itself. The relatively equal size of Paraphrase 1 and Paraphrase 2 shows that the Sender chose to break the story in about the middle in order to address a question to the Receiver. These facts are reflected in the relative number of signs for all five Receivers, in spite of the Receiver-differences observed.

The Sender's type:token ratio in signing each task to each Receiver is displayed in Table 2. This is a measure of flexibility in choice of vocabulary items. The most dramatic Receiver difference is seen in the Instruction task, where there is a very low type:token ratio for H.O. and E.I. This is predicted for H.O., but not for E.I. In Paraphrase 1 there is a lower type:token ratio for H.O. and S.E., but it is not so dramatic. Notice that this measure does not vary systematically according to Receiver across tasks (although E.I. and S.E. are adjacent to each other on all three Receiver ranking scales, and H.O. and E.I. and S.E. are all female). Overall, the Sender exhibited a lower type:token ratio in his signing to H.O. than in his signing to the other four Receivers.

Table 2. Sender's Type:Token Ratio to Each Receiver in Each Task.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	0.98	0.81	0.58	0.52	0.81
Paraphrase 1	0.80	0.73	0.82	0.70	0.85
Paraphrase 2	0.82	0.83	0.84	0.81	0.80
Across Tasks	0.83	0.79	0.79	0.69	0.82

An interesting task difference can be seen here. There is considerably more variation in the type:token ratio to different Receivers in the Instruction task. This variation is levelled at a fairly high type:token ratio in the Paraphrase tasks. This is particularly interesting in the case of Paraphrase 2, because the type:token ratio is very uniform across Receivers in spite of the feedback the Sender has just had (task 3, not reported here). One interpretation is that the narrative nature of the Paraphrase tasks overrides Receiver variables. An alternate interpretation of the Paraphrase 2 results is that the Sender revised his original estimate of Receiver proficiency upwards on the basis of feedback, so that in none of the five cases did an assessment of low Receiver proficiency constrain the second part of the narrative.

### Morphology

The degree to which the Sender used incorporation in his signing is shown in Table 3. The proportion of incorporation reflects small actual counts, between one and ten incorporations in any one task to any one Receiver (see Appendix C). Incorporation results in a more complex sign, and perhaps, less explicitness for someone not proficient in signing.

Table 3. Proportion of Incorporations to Total Signs Used by Sender with Each Receiver in Each Task.

Task	Receiver					$\bar{X}$
	D.A.	S.E.	E.I.	H.O.	B.U.	
Instruction 1	0.077	0.043	0.038	0.019	0.024	0.040
Paraphrase 1	0.076	0.100	0.059	0.051	0.091	0.075
Paraphrase 2	0.077	0.073	0.071	0.123	0.053	0.079
Across Tasks	0.077	0.074	0.061	0.071	0.060	0.069

Table 3 indicates that the Sender did not systematically modify the degree of incorporation in his signing on the basis of a Receiver variable. If Paraphrase 2 has a levelling effect, as discussed above, the results can be interpreted differently. The proportion of incorporations signed to H.O. is clearly the lowest in the first two tasks measured. This is predicted by the Receiver variables outlined in Chapter 2. It is more difficult to see why the Sender used so few incorporations in his signing of Instruction 1 to B.U.

This might be partially explained by a task difference. The Sender signed proportionally fewer incorporations in the Instruction task to all Receivers except D.A. The proportion for D.A. may result from an order effect (not seen in other measures), since this was the first task to the first Receiver in the study.

The proportion of reduced forms is shown in Table 4. The sender signed very few of these, between zero and four to each Receiver in each task. A slight task difference can be seen; three reduced forms were signed to each receiver except H.O., who Receiver four, in Paraphrase 2. This is the same levelling seen in other measures. Receiver differences were not systematic.

Table 4. Proportion of Reduced Forms to Total Signs Used by Sender with Each Receiver in Each Task.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	--	--	0.077	0.019	0.024
Paraphrase 1	0.015	--	--	0.038	0.030
Paraphrase 2	0.038	0.037	0.057	0.037	0.040
Across Tasks	0.024	0.016	0.040	0.033	0.033

Amount of indexical reference varied according to task, but not according to Receiver. This is shown in Table 5. Proportion of indexical reference was fairly high in the Instructions, where the Sender explained the nature of the presentation and the roles that both he and the Receiver would play. Here the Sender used explicit first

Table 5. Proportion of Indexical References to Total Signs Used by Sender with Each Receiver in Each Task.

Task	Receiver					$\bar{X}$
	D.A.	S.E.	E.I.	H.O.	B.U.	
Instruction 1	0.308	0.298	0.346	0.269	0.214	0.287
Paraphrase 1	0.015	--	--	--	--	0.003
Paraphrase 2	0.051	0.061	0.071	0.037	0.067	0.057
Across Tasks	0.077	0.101	0.095	0.080	0.077	0.086

and second person pronouns. Interestingly, these pronouns can be incorporated in verb signs, but it appears that the Sender chose not to use this device in the Instructions in the interest of clarity. These indexical references were not necessary in the Paraphrase, which was a third-person narrative. (However many other signs in the Paraphrase were subjected to incorporation, e.g. STOP-CAR and TWO-WEEK.)

### Syntax

The number of utterances signed is displayed in Table 6. Utterance counts are only partially parallel to the sign counts discussed earlier (see Table 1). For example, the same ranking is seen in task differences: Instruction 1 has the fewest signs and utterances, Paraphrase 2 has the most. However, the difference between the two Paraphrase tasks is greater in the utterance count. This reflects a complexity difference which will be discussed later. Across tasks, counts show that the most utterances were signed to H.O., the fewest to E.I. This parallels the results on the sign measure (see Table 1). Otherwise, systematic Receiver differences cannot be seen.

Table 6. Total Number of Utterances Signed by Sender to Each Receiver in Each Task.

Task	Receiver					$\bar{X}$
	D.A.	S.E.	E.I.	H.O.	B.U.	
Instruction 1	4	5	2	2	4	3.4
Paraphrase 1	8	5	5	6	6	6.0
Paraphrase 2	6	9	9	13	8	9.0
Across Tasks	18	19	16	21	18	18.4

Table 7. Number of Propositions Per Utterance Signed by Sender to Each Receiver in Each Task.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	1.3	2.2	3.5	5.5	1.8
Paraphrase 1	1.8	2.8	2.2	3.2	2.3
Paraphrase 2	3.8	2.9	2.7	2.0	2.4
Across Tasks	2.3	2.7	2.6	2.7	2.2

Table 7 shows the number of propositions per utterance signed to each Receiver in each task. These results disconfirm the prediction that the number of propositions per utterance will decrease from highest to lowest ranking Receiver. The Receiver ranking on this measure is presented in Figure 5. This figure shows that there is no consistency in the ranking across the three tasks. None of these rankings matches the rankings according to social variables in Figure 4.

Figure 5. Ranking of Receivers, from high to low, on the basis of number of propositions per utterance in each task.

<u>Instruction 1</u>	<u>Paraphrase 1</u>	<u>Paraphrase 2</u>	<u>Across Tasks</u>
H.O.	H.O.	D.A.	H.O., S.E.
E.I.	S.E.	S.E.	E.I.
S.E.	B.U.	E.I.	D.A.
B.U.	E.I.	B.U.	B.U.
D.A.	D.A.	H.O.	

Three subjects (D.A., S.E. and B.U.) show a consistent task difference, with a very small increase in the number of propositions per utterance in each successive task, but the difference is too small to interpret. The failure to find any systematic differences across Receivers or tasks leads to the question of whether this measure is a complexity measure in ASL in the same way it is in vocal languages.

Number of signs per utterance was not a useful measure of complexity in this study because it is linked with the propositions per utterance data just discussed. A more informative measure was number of signs per proposition. These data are supplied in Table 8. Both Receiver and task differences can be seen.

In each task, and across tasks, the greatest number of signs per proposition were signed to B.U., with D.A. close behind. If number of signs per proposition is a true complexity measure in ASL, as words per proposition or sentence is considered to be in spoken languages, we would predict this result for B.U. The only social variable ranking in which D.A. is adjacent to B.U. is the ranking according to occupation (Figure 4). The other three subjects are ranked variably on this measure, except that E.I. is ranked lowest in two tasks (Instruction 1 and Paraphrase 2) and when the measure is made across all three tasks.

Table 8. Number of Signs Per Proposition Signed by Sender to Each Receiver in Each Task.

Task	Receiver					$\bar{X}$
	D.A.	S.E.	E.I.	H.O.	B.U.	
Instruction 1	5.2	4.3	3.7	4.7	6.0	4.8
Paraphrase 1	4.7	4.3	4.6	4.2	4.9	4.5
Paraphrase 2	3.4	3.2	2.9	3.1	3.9	3.3
Across Tasks	4.1	3.7	3.6	3.8	4.6	4.0

Since E.I. ranks with D.A. on the occupation scale, and above him in terms of age and signing proficiency, the social variables of age, occupation and signing proficiency do not predict the ranking in terms of number of signs per proposition, except possibly for B.U. It is interesting to note that these results parallel the results on another complexity measure, type:token ratio; the three lowest ranked Receivers are female. The actual number differences on which the Receivers were ranked on this measure are quite small and probably not significant. These results should be interpreted accordingly.

Across Receivers, the Sender tended to decrease the number of signs per proposition in each subsequent task. This is particularly noticeable in Paraphrase 2, where this number is quite low for all Receivers. As in other measures, this is attributed to characteristics of narrative, particularly when it includes dialogue.

The Sender repeated propositions, completely or in part, to varying degrees in the different task presentations. Repetition indicates a reduction in complexity; i.e. number of unique propositions to total number of propositions yields a ratio analogous to the type:token ratio. This ratio is presented in Table 9. Table 9 clearly shows that, although there are not consistent Receiver differences from

Table 9. Proportion of Unique to Total Propositions.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	0.60	0.91	0.57	0.64	0.86
Paraphrase 1	0.86	0.71	0.91	0.58	1.00
Paraphrase 2	0.87	0.81	0.88	0.54	0.90
Across Tasks	0.83	0.80	0.83	0.57	0.93

one individual task to another, across tasks the highest proportion of unique propositions was signed to B.U., the lowest to H.O. If Receivers are ordered according to across-task ratio, the resulting rank order exactly matches the rank order based on occupation status (see Figure 4). With the exception of H.O.'s ratio, which is dramatically lower than the others, Receiver ratios are relatively consistent in Paraphrase 2. This is compatible with results based on other measures.

Table 10 presents the repetition measure in a different way. In this table we see a partial explanation for the propositions per utterance results--purportedly a complexity measure--discussed earlier. The large number of utterances, propositions, and signs per utterance addressed to H.O. apparently includes, and is in part accounted for by, a high degree of repetition. Just as the Sender's signing to H.O. was very repetitive, his signing to B.U. was markedly nonrepetitive. Signing to the other three Receivers was quite similar on this measure. The reduction of complexity provided by repetition is in the interest of clarity; the Receiver has more chances to understand the message being signed.

Table 10. Number of Repetitions per Utterance.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	0.50	0.20	1.50	2.00	0.25
Paraphrase 1	0.25	0.80	0.20	1.33	--
Paraphrase 2	0.50	0.56	0.33	0.92	0.25
Across Tasks	0.39	0.53	0.44	1.14	0.17

Rate

The Sender's rate of signing was computed as number of signs per second, including pause duration and excluding pause duration. (Total durations for signing and pauses are presented in Appendix C). The signing rates for each Receiver in each task are shown in Tables 11 and 12. Very little difference can be seen in the Sender's rate of signing to individual Receivers, with one exception. He signed at a faster rate in all tasks to B.U.

Table 11. Rate of Signing in Number of Signs per Second (Including Pauses).

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	1.6	1.7	1.7	1.8	2.0
Paraphrase 1	1.1	1.2	1.1	1.2	1.3
Paraphrase 2	1.3	1.2	1.2	1.2	1.6
Across Tasks	1.3	1.3	1.3	1.3	1.5

Table 12. Rate of Signing in Number of Signs Per Second (Not Including Pauses).

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	1.7	1.8	1.8	1.8	2.2
Paraphrase 1	1.3	1.2	1.2	1.3	1.4
Paraphrase 2	1.4	1.5	1.5	1.4	1.8
Across Tasks	1.4	1.5	1.4	1.5	1.7

According to Goldman-Eisler (cited in Bellugi, 1972), variation in pause time rather than signs per second is the true indicator of differing rates of expression. This does not appear to be the case in this study. A comparison of Tables 11 and 12 shows that the extent and direction of rate differences across Receivers and tasks remain fairly constant, regardless of whether pause duration is included in the calculation. A small difference can be seen when the signing in the two paraphrase tasks are compared in Table 11 and Table 12. The slightly greater increase in rate when pauses are not included in the computation may indicate that a faster rate of actual signing or increased pauses accompanied the dialogue or story climax in the second part of the narrative.

In general, the instructions were signed at a faster rate than the story. A slower signing rate may be yet another characteristic of an ASL narrative style. Bellugi (1972) reports the rate of signed conversation to be 2.1 signs per second. In this study, the signing rate in the Instruction task is closer to, but still lower than this figure. Thus signed instructions are more like signed conversation than is signed narrative, but they are still different. The slower rate in the Instructions in this study may reflect an individual difference in signing rate, presence of the video camera, or the Sender's desire to make the Instructions absolutely clear to his Receivers.

### Headtilt

The Sender used more forward and backward than left and right headtilts in all tasks signed to all Receivers. In the Instructions, he consistently marked utterance boundaries with forward headtilts. This may be reflected in the relatively high proportion of headtilts shown in the Instruction task in Table 13. Because both forward and backward headtilts are reportedly used to mark syntactic boundaries, they are combined in this table. The data in Table 13 reinforce this interpretation of forward and backward headtilts, since the Sender averages about one headtilt per proposition.

The smaller proportion of headtilts shown in Table 14 reflects the different functions of side and forward-backward headtilts. There

Table 13. Number of Forward and Backward Headtilts per Proposition.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	1.4	1.3	1.6	1.5	1.7
Paraphrase 1	1.5	0.9	1.2	1.0	1.0
Paraphrase 2	0.7	0.9	0.5	1.0	0.8
Across Tasks	1.1	1.0	0.8	1.1	1.0

Table 14. Number of Left and Right Headtilts per Proposition.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	0.4	0.3	0.3	0.3	0.4
Paraphrase 1	0.4	0.6	0.6	0.7	0.4
Paraphrase 2	0.3	0.3	0.2	0.4	0.7
Across Tasks	0.4	0.4	0.3	0.5	0.5

was a slightly higher proportion of headtilts in Paraphrase 1, perhaps due to the description involved in telling the story. The Sender used no tilts to the right in the Instruction task (see Appendix C). No systematic Receiver differences can be seen in Table 13 or Table 14.

#### Body movement

Analysis of body movement included measures of shoulder raises, body turn, and changes in body inclination. Overall, the Sender used a

greater number of these nonsign movements with H.O., especially shoulder raises. Interpretation of the use of these movements, however, requires that they be normalized in terms of the number of utterances or propositions signed to each Receiver. For this reason, the data in Tables 15, 16 and 17 are presented as number of each movement per proposition.

Table 15. Number of Shoulder Raises per Proposition.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	--	--	0.1	0.4	0.4
Paraphrase 1	0.3	0.4	0.9	0.6	0.4
Paraphrase 2	0.3	0.1	0.2	0.4	0.3
Across Tasks	0.2	0.2	0.4	0.5	0.4

Table 16. Number of Body Turns per Proposition.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	--	0.1	0.1	--	--
Paraphrase 1	0.6	0.4	0.5	0.3	0.4
Paraphrase 2	0.3	0.2	0.2	0.3	0.2
Across Tasks	0.4	0.2	0.2	0.2	0.2

Table 17. Number of Changes in Body Inclination per Proposition.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	0.6	0.2	0.1	0.3	0.3
Paraphrase 1	--	0.1	0.5	0.1	0.4
Paraphrase 2	0.4	0.3	0.3	0.3	0.3
Across Tasks	0.3	0.2	0.3	0.2	0.3

Tables 15, 16 and 17 show no systematic variation in shoulder raises, body turns or changes in body inclination according to Receiver variables. A slightly higher number of shoulder raises to H.O. is consistent with hypotheses about body movement and reflects the greater absolute number mentioned above.

A few task differences can be seen in these measures. The Sender used more shoulder raises in Paraphrase 1 than in the other two tasks. This may be related to the descriptive content of the first part of the narrative, since shoulder raises are often used in ASL to indicate quantitative notions such as the size of an object, person or event, or extent of a quality. The story included concepts such as 'very beautiful' and 'little house.' The overall low rate of shoulder raises in the Instruction task can be explained on these grounds (see Table 15).

Body turns, like shoulder raises, were very infrequent in the Instruction task and most frequent in Paraphrase 1 (see Table 16). Changes in body inclination were consistent across Receivers in Paraphrase 2 (see Table 17). The Sender seemed to be using a style of signing typical of quoting direct dialogue. When he took the role of the first party, he turned to one side. When he responded in the second role, he changed his body orientation. This device is similar to "indexing," that is, assigning a person or object a place in space;

this space is then used to refer to the person or object in subsequent references.

### Amplitude

Amplitude was measured as signs executed beyond the normal signing space. In absolute terms, the greatest number of extended signs were signed to D.A. and H.O. Because of the large variation in number of signs and number of propositions across Receivers, this measure was analyzed as number of spatial extensions per proposition. The results are summarized in Table 18. The table shows that a relatively (as well as absolutely) greater number of signs were signed with greater amplitude to D.A. than to the other Receivers. On the other hand, signing to H.O. was similar to signing to the other Receivers on this measure.

The interesting difference here is one between tasks. Spatial extensions were very infrequent in the Instructions but considerably more frequent in the narrative, especially the first part. This is probably related to descriptively setting the scene in the narrative.

Table 18. Number of Spatial Extensions per Proposition.

Task	Receiver				
	D.A.	S.E.	E.I.	H.O.	B.U.
Instruction 1	0.4	0.2	--	0.2	--
Paraphrase 1	1.4	0.9	1.3	0.7	1.0
Paraphrase 2	0.8	0.5	0.4	0.9	0.2
Across Tasks	1.0	0.5	0.6	0.7	0.7

### Summary of Receiver-related Signing Variation

The results of this study show that the Sender modified his signing of each task to each Receiver. This modification was not as systematic on the basis of Receiver variables as hypothesized in Chapter 2. Thus, these hypotheses are not supported in their strong form. That is, systematic differences in the predicted direction are not seen on any given measure if all Receivers are considered individually and ranked according to age, occupation or signing proficiency. Rank ordering of Receivers matched a predicted ordering (based on occupation) on only one measure; proportion of unique propositions. In spite of this, some systematicity can be seen in the Sender's modifications to different Receivers.

The hypotheses correctly predicted a number of specific modifications in the Sender's signing to H.O., the lowest ranked Receiver on the basis of age, occupation and signing proficiency. The Sender signed more signs, propositions and utterances to H.O. than to any other Receiver. This is accounted for, in part, by a high degree of redundancy. The Sender repeated many propositions, so that the lowest proportion of unique propositions was signed to H.O. Although the Sender signed the greatest number of signs to H.O., this also showed a high degree of redundancy. The Sender's lowest type:token ratio was measured in his signing to her. He also used the relatively least amount of incorporations in his signing to H.O. All of these modifications worked to make the signed message simpler and clearer. It is interesting to note that they are virtually the same modifications as those made by adults speaking to young hearing children (see references in Snow & Ferguson, 1977). Modifications in signing to H.O. were more dramatic and consistent than those addressed to any other Receiver.

The hypotheses also predicted a cluster of modifications in signing addressed to B.U., the Receiver ranked highest on all three scales. In signing to B.U., the Sender had a high type:token ratio and used the highest proportion of unique propositions. Results on these two measures show that there was less redundancy in the messages signed to B.U. than those signed to any other Receiver. The Sender also used the most signs and propositions in his signing to B.U. This should indicate a greater degree of linguistic complexity. Finally, the Sender signed at a faster rate to B.U. than to the other Receivers.

All of these results are in the direction of increased complexity.

Signing to D.A. was characterized by an interesting mixture of ASL modifications. D.A. ranked highest on several measures and lowest on others. These results cannot be explained in terms of the social variables defined in this study. The lowest proportion of reduced forms and the highest proportion of spatially extended signs were signed to D.A. These were both predicted to be measures of simplicity or clarity. On the other hand, the Sender used his highest type:token ratio and a high number of signs per proposition in signing to D.A. These measures both indicate a more complex level of signing.

Modifications to the two remaining Receivers are even harder to characterize. E.I. received fewer signs and utterances than any other Receiver. The Sender also used a low type:token ratio in signing to her. S.E. received the lowest proportion of reduced forms but was at neither extreme on most measures. On two complexity measures -- type:token ratio and signs per proposition -- male Receivers ranked high relative to female Receivers.

#### Summary of Task-related Signing Variation

This study was designed to focus on Receiver-related variation, but some of the most interesting results are related to differences between tasks. The Instructions and the Paraphrase are clearly distinguished on a number of measures. Much of the observed task-related variation is predictable in terms of the nature of each task. In Instruction 1, the Sender explains the program of events and what each participant would do. The Paraphrase task was a story that involved description of characters, locations, events and time, and (in the second part) dialogue.

The Paraphrase task was characterized by a high type:token ratio and more propositions per utterance than the Instruction task. On the other hand, it also showed a lower number of signs per proposition, especially in the second part, which included the dialogue. Prosodic and paralinguistic characteristics are particularly interesting. Across Receivers, the Paraphrase tasks contained more spatial extensions (greater amplitude) and shoulder raises, especially in Paraphrase 1, which involved more description. The narrative also contained more side headtilts, again associated with description. It

was signed more slowly than the Instructions. This slower rate was partially due to longer or more pauses, particularly in Paraphrase 2.

A number of measures were so strongly influenced by the Paraphrase tasks that Receiver-related variation levelled out. This was particularly true of Paraphrase 2. Measures in this group include type:token ratio (high as well as uniform), proportion of incorporations, reduced forms and unique propositions, and changes in body inclination.

The Instructions were brief, with utterance boundaries consistently marked by headtilt. This task allowed more Receiver-related variation in type:token ratio and tended to be less marked on the prosodic and paralinguistic measures. Instruction 1 was signed at a faster rate than the narrative, but still not as fast as is reported for normal signed conversation.

## CHAPTER 4

### CONCLUSIONS

Description of style-switching in ASL is attainable via investigative analyses similar to those used in studies of style-switching in other languages. The information derived from these studies provides the data from which the rules of communication can be established. The current study has shown that it is possible to isolate and describe particular aspects of the ASL code that undergo change when the relationship between participants or the communicative goal is altered. Using this description, conjecture about the rules of ASL communication in particular and communicative interaction in general becomes possible.

The results of this study, based on data provided by a single set of sender-receiver dyads can be used as an example of the precise information that is available using such an approach. On the basis of a quantitative analysis of seven categories of performance parameters, it was possible to examine the differences between two tasks. Results revealed a marked distinction between the Instructions and the Paraphrase tasks, thereby establishing a profile for an information-giving style and a story-telling style. Although it was previously mentioned that these differences in style might reflect an informal versus formal distinction, it is possible to conclude only that the tasks were visibly different. Further research will be necessary to confirm the reality of the proposed styles of presentation and to open up the question of correlation between apparent characteristics of story-telling versus information-giving and formal versus informal classification.

Comparison of performance profiles based on self editing procedures of the Sender, revealed two styles of signing distinct from

a third, more neutral style. The first, observed in the Sender's signing to the child, was marked by extent and redundancy of the message and greater reliance on parameters that augmented clarity. The second distinct style was seen in the Sender's performance to an adult who ranks higher than the Sender in terms of age, occupation and assessed signing proficiency.




The fact that distinct styles of signing emerged from the analysis of the data is not as remarkable as the opportunity to describe the nature of linguistic and paralinguistic variation in ASL. This study has demonstrated the reality of the performance categories analyzed and the extent of measurable variation within these categories. Some of these categories are clearly more relevant to this type of study than others. Measures that are less useful are those that showed very little variation across participants or tasks.

Although it was not possible in this investigation to tease out the influence that each of the social characteristics of the Receivers had on the Sender's performance, it was clearly evident that style-switching did occur. That the content presented in each case was virtually identical, and that the circumstances of presentation were identical, leads to the conclusion that the sender was sensitive to particular characteristics of the communication situation. The clearest display of self-editing by the sender served to confirm the existence of an adult-to-child register in ASL, and a distinct narrative style. This confirmation adds further evidence to the claim that ASL parallels spoken languages of the world. Furthermore, the description of the self-editing procedure can be added to what is currently known about style-switching in languages of the world.

This investigation, then, has been able to furnish preliminary information about what changes occur in ASL, how these changes are manifested and when these changes occur. Further research will be required to determine whether these styles of signing are maintained given different tasks, different receivers and, above all, different principal signers. Results obtained in this investigation must be interpreted with caution, as it is possible that the observed styles of signing are idiosyncratic. The crucial fact is that the patterns of variation were discernable.

## APPENDIX A

## NOTATIONAL SYSTEM

SIGN	Words in capital letters indicate the English gloss for ASL signs.
SIGN-SIGN	Two word glosses connected by hyphens are used when more than one English word is required to translate a single sign e.g. WAKE-UP.
'meaning'	Words within single quotation marks represent the meaning or referent of the signs: e.g., 'tree' indicates the referent tree, not the English word <u>tree</u> .
SIGN  SIGN	Sign glosses joined by an arc refer to the use of two ASL signs to express a single lexical unit: e.g. FACE  NEW refers to 'stranger'.
SIGN [x]	A sign that has undergone indexical change, as in INFORM [x:'me'] or INFORM [x:'me to you'].
W-O-R-D	Fingerspelled words are represented in capital letters with hyphens between letters.
SIGN +	A plus mark is used to indicate repetition of a sign. e.g. NIGHT ++ indicates the sign NIGHT was made three times.
//	The double bar indicates a brief pause at the end of an utterance. During the pause, hands are held in the same position as the last sign.
##	The double crossed bars indicate a pause of relatively long duration. The hands return to rest position.
	A line under either the double bar or the double cross bars indicate that the configuration of the last sign was held during the pause.

APPENDIX B  
PARAPHRASE TASK

Explain to the other person what you are going to do, and what you want him/her to do. Then tell the story in your own words. You should ask one or two questions about the story to encourage comment by the other person.

A young woman dreamed one night that she was walking along a strange country road. It led her up a hill, on top of which was the loveliest little white house and garden she had ever seen. Unable to conceal her delight, she knocked loudly on the door of the house, and finally it was opened by an old, old man with a long white beard. Just as she started to talk to him, she woke up. Every detail of the dream was so clear in her memory that she thought about it for days. Then, three nights in a row, she had exactly the same dream again. She always woke up at the point when her conversation with the old man was about to begin.

A few weeks later, the young woman was driving to Chilliwack to visit a friend, when she suddenly pulled off the road and stopped her car. There, on the right of the highway was the country road of her dreams! She got out of the car and started walking up the road. She was not surprised when she arrived at the top of the hill and saw the house, which was now so familiar to her. She knocked on the door and the old man answered. "Tell me," she began, "is this little house for sale?" "Yes it is," said the man "but I wouldn't advise you to buy it. You see, this house is haunted!" "Haunted," said the woman, "by whom?" "By you," replied the old man and he softly closed the door.

Sample questions:

1. What did the young lady dream?
2. What happened when she found the house?

## APPENDIX C

## SUMMARY OF UNINTERPRETED COUNTS OF PERFORMANCE PARAMETERS

Table A: Total Number of Each Performance Parameter Used by Sender  
With Each Receiver in Instruction 1 (Task 1)

PARAMETER	RECEIVER *				
	D.A.	S.E.	E.I.	H.O.	B.U.
Signs (tokens)	26	47	26	52	42
Unique signs (types)	25	38	15	27	34
Incorporations	2	2	1	1	1
Reduced forms	--	--	2	1	1
Indexical references	8	14	9	14	9
Utterances	4	5	2	2	4
Propositions	5	11	7	11	7
Repetitions of propositions (partial or complete)	2	1	3	4	1
Duration in seconds (including pauses)	16.6	27.1	14.9	29.2	21.0
Duration of between- utterance pauses in seconds	1.2	1.5	0.6	0.3	1.8
Head tilts, backwards	4	6	5	6	6
Head tilts, forwards	3	9	6	10	6
Head tilts, right	--	--	--	--	--
Head tilts, left	2	3	2	3	3
Shoulder raises	--	--	1	4	3
Body turns	--	1	1	--	--
Changes in body inclination	3	2	1	3	2
Extensions beyond canonical signing space	--	2	--	2	--

\*Receivers are listed in order of presentation

Table B: Total Number of Each Performance Parameter Used by Sender  
With Each Receiver in Paraphrase 1 (Task 2)

PARAMETER	RECEIVER*				
	D.A.	S.E.	E.I.	H.O.	B.U.
Signs (tokens)	66	60	51	79	66
Unique signs (types)	52	44	42	55	56
Incorporations	5	6	3	4	6
Reduced forms	1	--	--	3	2
Indexical references	1	--	--	--	--
Utterances	8	5	5	6	6
Propositions	14	14	11	19	14
Repetitions of propositions (partial or complete)	2	4	1	8	--
Duration in seconds (including pauses)	58.0	50.8	46.2	68.0	53.0
Duration of between- utterance pauses in seconds	5.9	2.2	2.3	7.1	5.7
Head tilts, backwards	13	11	7	10	6
Head tilts, forwards	9	2	6	8	8
Head tilts, right	1	3	1	4	2
Head tilts, left	6	5	5	9	4
Shoulder raises	4	6	10	11	6
Body turns	9	5	5	5	6
Changes in body inclination	--	1	5	1	5
Extensions beyond canonical signing space	19	12	14	14	14

\*Receivers are listed in order of presentation

Table C: Total Number of Each Performance Parameter Used by Sender  
With Each Receiver in Paraphrase 2 (Task 4)

PARAMETER	RECEIVER*				
	D.A.	S.E.	E.I.	H.O.	B.U.
Signs (tokens)	78	82	70	81	75
Unique signs (types)	64	68	59	65	60
Incorporations	6	6	5	10	4
Reduced forms	3	3	4	3	3
Indexical references	4	5	5	3	5
Utterances	6	9	9	13	8
Propositions	23	26	24	26	19
Repetitions of propositions (partial or complete)	3	5	3	12	2
Duration in seconds (including pauses)	58.9	66.7	57.7	68.3	47.5
Duration of between- utterance pauses in seconds	2.1	11.3	10.0	11.9	4.7
Head tilts, backwards	7	14	12	13	7
Head tilts, forwards	9	10	9	14	8
Head tilts, right	--	1	1	2	1
Head tilts, left	6	6	4	9	12
Shoulder raises	6	3	5	10	6
Body turns	6	4	4	8	3
Changes in body inclination	8	7	7	8	6
Extensions beyond canonical signing space	19	13	10	23	4

\*Receivers are listed in order of presentation

## BIBLIOGRAPHY

- Andersen, E.S., and Johnson, C.E. "Modifications in the Speech of an Eight-Year-Old as a Reflection of Age of Listener." Stanford Occasional Papers in Linguistics 3:149-160. 1973.
- Baker, C.L. "What's Not on the Other Hand in American Sign Language." In Papers From the Twelfth Regional Meeting Chicago Linguistic Society. Edited by S.S. Mufwene, C.A. Walker and S.B. Steever. Chicago: Chicago Linguistic Society. 1976.
- \_\_\_\_\_. "Regulators and Turn-Taking in American Sign Language Discourse." In On the Other Hand. Edited by L. Friedman. 1977.
- Baker, C.L. and Padden, C.A. "Focusing on the Nonmanual Components of American Sign Language." In Understanding Language Through Sign Language Research. Edited by P. Siple. 1978.
- Battison, R. "Phonological Deletion in American Sign Language." Sign Language Studies. 5:1-19. 1974.
- \_\_\_\_\_. Lexical Borrowing in American Sign Language. Silver Springs: Linstok Press. 1978.
- Ball, R.T. Sociolinguistics: Goals, Approaches and Problems. London: B.T. Batsford. 1976.
- Bellugi, U. "Studies in Sign Language." In Psycholinguistics and Total Communication: The State of the Art. Edited by T.J. O'Rourke. Washington: American Annals of the Deaf. 1972.
- Bellugi, U. and Fischer, S. "A Comparison of Sign Language and Spoken Language." Cognition. 1:173-200. 1972.
- Bellugi, U. and Klima, E. "Two Faces of Sign: Iconic and Abstract." In Origins and Evolution of Language and Speech. Edited by S.R. Harnad, H.D. Steklis and J. Lancaster. New York: New York Academy of Sciences. 1976.
- Bellugi, U. and Klima, E. "Aspects of Sign Language and It's Structure." In The Role of Speech in Language. Edited by J.F. Kavanagh and J.E. Cutting. 1975.
- Berko Gleason, J. "Code Switching in Children's Language." In Cognitive Development and the Acquisition of Language. Edited by T.E. Moore. New York: Academic Press. 1973.
- Bernstein, B. "Elaborated and Restricted Codes: Their Social Origins and Some Consequences." American Anthropologist 66,6:55-69. 1964a.

- \_\_\_\_\_. "Aspects of Language in the Genesis of the Social Process." In Language in Culture and Society. Edited by D. Hymes. 1964b.
- \_\_\_\_\_. "Social Class, Language and Socialization." In Language and Social Context. Edited by P.P. Giglioli. 1972a.
- \_\_\_\_\_. "A Sociolinguistic Approach to Socialization; With Some Reference to Educability." In Directions in Sociolinguistics. Edited by J.J. Gumperz and D. Hymes. 1972.
- Blom, J. and Gumperz, J.J. "Social Meaning In Linguistic Structure: Code-Switching in Norway." In Directions in Sociolinguistics. Edited by J.J. Gumperz and D. Hymes. 1972.
- Bode, L. "Communication of Agent, Object and Indirect Object in Signed and Spoken Languages." Perceptual and Motor Skills. 39:1151-1158. 1974.
- Bragg, B. "Ameslish - Our American Heritage: A Testimony." American Annals of the Deaf. 118:672-674. 1973.
- Bright, W. Variation and Change in Language. Stanford: Stanford University Press. 1976.
- Brown, P. and Fraser, C. "Speech as a Marker of Situation." In Social Markers in Speech. Edited by K. Scherer and H. Giles. Cambridge: Cambridge University Press. 1979.
- Brown, R. and Gilman, A. "The Pronouns of Power and Solidarity." In Style in Language. Edited by T.A. Sebeok. Cambridge: The MIT Press. 1960.
- Bynon, T. Historical Linguistics. Cambridge: Cambridge University Press. 1977.
- Cicourel, A.V. "Sociolinguistic Aspects of the Use of Sign Language." In Sign Language of the Deaf. Edited by I.M. Schlesinger and L. Namir. 1978.
- Cicourel, A.V. and Boese, R.J. "Sign Language Acquisition and the Teaching of Deaf Children, Part I." American Annals of the Deaf. 117:27-33. 1972.
- Cicourel, A.V. and Boese, R.J. "Sign Language Acquisition and the Teaching of Deaf Children, Part II." American Annals of the Deaf. 117:403-411. 1972.
- Cohen, E., Namir, L. and Schlesinger, I.M. A New Dictionary of Sign Language. The Hague: Mouton. 1977.
- Covington, V. "Juncture in American Sign Language." Sign Language Studies. 2:29-38. 1973.

- \_\_\_\_\_. "Features of Stress in American Sign Language." Sign Language Studies 2:39-50. 1973.
- Croneberg, C. "Sign Language Dialects." In A Dictionary of American Sign Language, pp. 313-319. Edited by W.C. Stokoe, D. Casterline and C. Croneberg. 1965.
- Crystal, D. "Prosodic and Paralinguistic Correlates of Social Categories." In Social Anthropology and Language. Edited by E. Ardener. London: Tavistock Publications. 1971.
- Crystal, D. and Davy, D. Investigating English Style. Bloomington: Indiana University Press. 1969.
- Dittmar, N. Sociolinguistics: A Critical Survey of Theory and Application. London: Edward Arnold. 1976.
- Eastman, G. Sign Me Alice: A Play in Sign Language. Washington D.C.: Gallaudet College. 1974.
- Edge, V. and Hermann, L. "Verbs and the Determination of Subject." In On the Other Hand. Edited by L.A. Friedman. 1977.
- Edwards, A. Language in Culture and Class. London: Heinemann Educational Books. 1976.
- Erting, C. "Language Policy and Deaf Ethnicity in the United States." Sign Language Studies 19:139-152. 1978.
- Ervin-Tripp, S. "An Analysis of the Interaction of Language, Topic and Listener." American Anthropologist 66,6:86-102. 1964.
- \_\_\_\_\_. "Sociolinguistics." In Advances in Experimental Social Psychology, Volume 4. Edited by L. Berkowitz. New York: Academic Press. 1969.
- \_\_\_\_\_. "On Sociolinguistic Rules: Alternation and Co-Occurrence." In Directions in Sociolinguistics. Edited by J.J. Gumperz and D. Hymes. 1972.
- \_\_\_\_\_. "Is Sybil There? The Structure of Some American English Directives." Language in Society 5:25-66. 1976.
- Ferguson, C. "Baby Talk in Six Languages." American Anthropologist 66,6:103-114. 1964a.
- \_\_\_\_\_. "Diglossia." In Language in Culture and Society. Edited by D. Hymes. 1964b.
- Fischer, S. "Two Processes of Reduplication in American Sign Language." Foundations in Language 9:469-480. 1973.

- \_\_\_\_\_. "Influences on Word Order Change in American Sign Language." In Word Order and Word Order Change. Edited by C.N. Li. Austin: University of Texas Press. 1975.
- Fischer, S. and Gough, B. "Verbs in American Sign Language." Sign Language Studies 18:17-48. 1978.
- Fishman, J.A. Sociolinguistics: A Brief Introduction. Mass: Newbury House. 1972a.
- \_\_\_\_\_. "The Sociology of Language." In Language and Social Context. Edited by P.P. Giglioli. 1972b.
- Frake, C.O. "How to Ask for a Drink in Subanan." American Anthropologist 66,6:127-132. 1964.
- Friedman, L.A. "Space, Time and Person Reference in American Sign Language." Language 51:940-961. 1975.
- \_\_\_\_\_. "The Manifestation of Subject, Object and Topic in American Sign Language." In Subject and Topic. Edited by C. Li. New York: Academic Press. 1976.
- \_\_\_\_\_. ed. On the Other Hand: New Perspectives on American Sign Language. New York: Academic Press. 1977.
- Giglioli, P.P. ed. Language and Social Context. Harmondsworth: Penguin Education. 1972.
- Giles, H. and Powesland, P. Speech Style and Social Evaluation. London: Academic Press. 1975.
- Giles, H., Scherer, K. and Taylor, D. "Speech Markers in Social Interaction." In Social Markers in Speech. Edited by K. Scherer and H. Giles. Cambridge: Cambridge University Press. 1979.
- Goffman, E. "The Neglected Situation." American Anthropologist 66,6:133-136. 1964.
- Goodenough, W.H. "Cultural Anthropology and Linguistics." In Language in Culture and Society. Edited by D. Hymes. 1964.
- \_\_\_\_\_. "Rethinking 'Status' and 'Role'." In The Relevance of Models for Social Anthropology. Edited by M. Banton. New York: Frederick A. Praeger. 1965.
- Grosjean, F. and Lane, H. "Pauses and Syntax in American Sign Language." Cognition 5:101-117. 1977.
- Gumperz, J. J. "Types of Linguistic Communities." Anthropological Linguistics 4,1:28-36. 1962.

- \_\_\_\_\_. "Linguistic and Social Interaction in Two Communities." American Anthropologist 66,6:137-153. 1964.
- \_\_\_\_\_. "Sociolinguistics and Communication in Small Groups." Working Paper No. 33. Language-Behaviour Research Laboratory. April 1970.
- \_\_\_\_\_. "The Speech Community." In Language in Social Groups. Edited by J.J. Gumperz. 1971.
- \_\_\_\_\_. ed. Language in Social Groups. Stanford: Stanford University Press. 1971.
- Gumperz, J.J. and Hymes, D. eds. Directions in Sociolinguistics: The Ethnography of Communication. New York: Holt, Rinehart and Winston, Inc. 1972.
- Hoemann, H.W. Communicating with Deaf People: A Resource Manual for Teachers and Students of American Sign Language. Baltimore: University Park Press. 1978.
- Hoemann, H.W. and Tweney, R.D. "Is the Sign Language of the Deaf An Adequate Communicative Channel?" American Psychological Association Proceedings 81:801-802. 1973.
- Hymes, D. "Linguistic Aspects of Cross-Cultural Personality." In Studying Personality Cross-Culturally. Edited by B. Kaplan. New York: Harper and Row. 1961.
- \_\_\_\_\_. "The Ethnography of Speaking." In Anthropology and Human Behavior. Edited by T. Gladwin and W.C. Sturtevant. Washington, D.C.: Anthropological Society of Washington, 1962.
- \_\_\_\_\_. "Introduction: Toward Ethnographies of Communication." American Anthropologist 66,6. 1964a.
- \_\_\_\_\_. ed. Language in Culture and Society. New York: Harper and Row. 1964b.
- \_\_\_\_\_. "Models of the Interaction of Language and Social Setting." Journal of Social Issues 23,2:8-28. 1967.
- \_\_\_\_\_. On Communicative Competence. Philadelphia: University of Pennsylvania Press. 1971. (Reprinted in abridged form in Pride and Holmes, 1972).
- \_\_\_\_\_. "Models of the Interaction of Language and Social Life." In Directions in Sociolinguistics: The Ethnography of Communication. Edited by J.J. Gumperz and D. Hymes. New York: Holt, Rinehart & Winston, Inc. 1972.
- \_\_\_\_\_. Foundations in Sociolinguistics: An Ethnographic Approach. Philadelphia: University of Pennsylvania Press. 1974.

- Ingram, R. "Theme, Rheme, Topic and Comment in the Syntax of American Sign Language." Sign Language Studies 20:193-218. 1978.
- Joos, M. The Five Clocks. Indiana: Indiana University Press. 1967.
- Jordon, I.K. and Battison, R. "A Referential Communication Experiment with Foreign Sign Language." Sign Language Studies 8:69-101. 1976.
- Kavanagh, J.F. and Cutting, J.E. eds. The Role of Speech in Language. Cambridge: The M.I.T. Press. 1975.
- Kegl, J.A. and Wilbur, R.B. "When Does Structure Stop and Style Begin?" In Papers From the Twelfth Regional Meeting Chicago Linguistic Society, pp. 376-396. Edited by S.S. Mufwene, C.A. Walker and S.B. Steever. Chicago: Chicago Linguistic Society. 1976.
- Klima, E. "Sound and It's Absence in the Linguistic Symbol." In The Role of Speech in Language. Edited by J. Kavanagh and J. Cutting. 1975.
- Klima, E. and Bellugi, U. The Signs of Language. Cambridge: Harvard University Press. 1979.
- Labov, W. "Phonological Correlates of Social Stratification." American Anthropologist 66,6:164-176. 1964.
- \_\_\_\_\_. The Social Stratification of English in New York City. Washington: Centre For Applied Linguistics. 1966.
- \_\_\_\_\_. "The Study of Language in It's Social Context." Studium Generale 23:30-87. 1970.
- Lambert, W. "A Social Psychology of Bilingualism." Journal of Social Issues 23:91-109. 1967.
- Laver, J. and Trudgill, P. "Phonetic and Linguistic Markers in Speech." In Social Markers in Speech. Edited by K. Scherer and H. Giles. 1979.
- Leduinka, J. "Race of Interviewer and the Language Elaboration of Black Interviewees." Journal of Social Issues 27:185-197. 1971.
- Liddell, S.K. "Nonmanual Signals and Relative Clauses in American Sign Language." In Understanding Language Through Sign Language Research. Edited by P. Siple. 1978.
- Long, J.S. The Sign Language: A Manual of Signs. Washington, D.C.: Gallaudet College Press. 1918.

- Lunde, A. "The Sociology of the Deaf." Quoted in W. Stokoe, Sign Language Structure, pp. 16-24. 1978.
- Lyons, J. Semiotics, Volume 2. London: Cambridge University Press. 1977.
- Mandel, M. "Iconic Devices in American Sign Language." In On the Other Hand. Edited by L.A. Friedman. 1977.
- Markowicz, H. "Some Sociolinguistic Considerations of American Sign Language." Sign Language Studies 1:15-41. 1972.
- Martin, S.E. "Speech Levels in Japan and Korea." In Language in Culture and Society. Edited by D. Hymes. 1964b.
- Mayberry, R. "French Canadian Sign Language: A Study of Inter-Sign Language Comprehension." In Understanding Language Through Sign Language Research. Edited by P. Siple. 1978.
- Meadow, K. "Sociolinguistics, Sign Language and The Deaf Sub-Culture." In Psycholinguistics and Total Communication. Edited by T. J. O'Rourke. Washington: American Annals of the Deaf. 1972.
- Namir, L. and Schlesinger, I.M. "The Grammar of Sign Language." In Sign Language of the Deaf. Edited by I.M. Schlesinger and L. Namir. 1978.
- O'Rourke, T.J. ed. Psycholinguistics and Total Communication: The State of the Art. Washington D.C.: American Annals of the Deaf. 1972.
- Pride, J. and Holmes, J. eds. Sociolinguistics: Selected Readings. Harmondsworth: Penguin. 1972.
- Scherer, K. and Giles, H. eds. Social Markers in Speech. Cambridge: Cambridge University Press. 1979.
- Schlesinger, H.S. and Meadow, K. Deafness and Mental Health: A Developmental Approach. San Francisco: Langley Porter Institute. 1971.
- Schlesinger, H.S. and Meadow, K. Sound and Sign: Childhood Deafness and Mental Health. Berkely: University of California Press. 1972.
- Schlesinger, H.S. and Namir, L. eds. Sign Language of the Deaf: Psychological, Linguistic and Sociological Perspectives. New York: Academic Press. 1978.
- Siple, P. ed. Understanding Language Through Sign Language Research. New York: Academic Press. 1978.

- Slobin, D.I. "On the Nature of Talk to Children." In Foundations of Language Development. Edited by E.H. Lenneberg and E. Lenneberg. New York: Academic Press. 1975.
- Snow, C.E. and Ferguson, C. eds. Talking to Children: Language Input and Acquisition. Cambridge New York: Cambridge University Press. 1977.
- Stokoe, W. Jr. Sign Language Structure. Studies in Linguistics Occasional Papers 8. Buffalo: University of Buffalo Press. 1960.
- \_\_\_\_\_. "Sign Language Diglossia." Studies in Linguistics. 21:27-40. 1970.
- \_\_\_\_\_. Semiotics and Human Sign Language. New York: Humanities. 1972.
- \_\_\_\_\_. "Classification and Description of Sign Languages." In Current Trends in Linguistics, Vol. 12 :345-371. The Hague: Mouton. 1974.
- \_\_\_\_\_. Sign Language Structure. Silver Springs, Maryland: Linstok Press. 1978.
- Stokoe, W. Jr., Casterline, D. and Croneberg, C. A Dictionary of American Sign Language. Washington: Gallaudet College. 1965. (Revised, Silver Springs: Linstok Press. 1976.)
- Tervoort, B.T. "You Me Downtown M-O-V-I-E Fun?" Lingua 21:455-456. 1968.
- Trudgill, P. Sociolinguistics: An Introduction. England: Penguin Books. 1974.
- Tweney, R.D. And Hoemann, H.W. "Translation and Sign Languages." In Translation. Edited by R.W. Brislin. New York: Gardner Press. 1976.
- Wilbur, R.B. "The Linguistics of Manual Language and Manual Systems." In Communication Assessment and Intervention Strategies. Edited by L.L. Lloyd. Baltimore: University Park Press. 1976.
- \_\_\_\_\_. American Sign Language and Sign Systems. Baltimore: University Park Press. 1979.
- Woodward, J.C. Jr. "Implications for Sociolinguistic Research Among the Deaf." Sign Language Studies 1:1-17. 1972.
- \_\_\_\_\_. "Some Characteristics of Pidgin Sign English." Sign Language Studies 3:39-46. 1973a.

\_\_\_\_\_. "Some Observations on Sociolinguistic Variation and American Sign Language." Kansas Journal of Sociology. 9.2:191-200. 1973b.

\_\_\_\_\_. "Interrule Implication in American Sign Language." Sign Language Studies 3:47-56. 1973c.

\_\_\_\_\_. "A Report on Montana-Washington Implicational Research." Sign Language Studies 4:77-101. 1974.

Woodward, J.C. Jr., Erting, C. and Oliver, S. "Facing and Hand(1)ing Variation in American Sign Language." Sign Language Studies 10:43-51. 1976.