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A Microanalysis of the Nonmanual Components of Questions
in American Sign Language

By

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DISSERTATION

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DOCTORAL DEGREE CONFERRED

DECEMBER 17, 1983

A Microanalysis of the Nonmanual Components of Questions
in American Sign Language

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by

Charlotte Lee Baker-Shenk

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Preface

CONFESSIONS OF A SIGN LANGUAGE LINGUIST

Self-righteous indignation is an occupational hazard for linguists like myself who are instinctively predisposed to leap atop their white horses . . . and subsequently, to their surprise, find themselves prancing with the heroes and heroines of paternalism who, honestly, just wanted to "help the deaf" (for some, translate: "save the deaf"). Right when we think we are helping deaf people fight the oppressors, we find we are adding a new insidious twist to the oppression.

Fortunately, Sign Language linguists, as we are called, have a lifeline: Deaf people. We need them to do our work. And to do our work well, we have to try to see the world through their eyes—with their histories, their hopes, their struggles, and their amazing accomplishments despite their experience.

That's how salvation (ours) comes. After awhile (after, of course, many years of horsing around on our white steeds), we begin to experience what could only be described as a profound respect, even awe, for the people who created and nurtured such an intricate and powerfully expressive language.

And with the respect comes the recognition: Deaf people would do fine if we could just stop oppressing them; if we could cease our violent attempts to make them over in our own image (i.e. make them hearing); and if we could admit that we

don't know "what's best for the deaf".

That's why I wrote Chapter I and included it in this, otherwise academic and esoteric, dissertation. I wrote it to help pay back the enormous debt I owe to those Deaf people who shared their language and their life with me. And I wrote it to encourage each hearing reader to become aware of the history and the hurt, and to try, with me, to stop being the oppressor.

ACKNOWLEDGEMENTS

I began work on this dissertation project six years ago, in the fall of 1977, when Bill Stokoe made a place for me at the Linguistics Research Lab (LRL) at Gallaudet College. That was three years after he had first encouraged my interest in ASL and began to share, generously as always, his knowledge and resources with me. Over these nine years, Bill has been my teacher and my friend. Nothing I can say on this page will begin to express my gratitude to him.

I am also very indebted to Paul Ekman and Wally Friesen for all they have taught me about the analysis of facial behavior in particular and human behavior in general, as well as the many years of their friendly support and patient encouragement. They made possible much of the work reported here (which is quite apparent when one reads this report).

Another scholar to whom I owe both an intellectual and personal debt is Adam Kendon. His work has for many years stimulated and guided my thinking. In the same vein, I would like to thank my first teacher of "nonverbal behavior", Mort Wiener, whose critical thinking both perplexed and encouraged my own.

Within the deaf community and the field of Sign Language research, I have many more people to thank. And I should begin with two: M.J. Bienvenu and Dennis Cokely, my colleagues in the LRL. M.J.'s intuitions about her language and willingness to share them have been invaluable to me; so has been her friendship and

trust. Dennis has taught me much of what I know about the politics and mechanics of the deaf ed community. He also has guided my learning of ASL, sharing his insights as a successful adult learner of the language. Both contributed in major ways to this project: M.J. did transcriptions of manual behaviors and context/translations as well as served as a model for illustrations; Dennis also did context/translations and read and critiqued the entire manuscript (while working on his own dissertation; that's selfless!). Bill Stokoe and Phil Baker-Shenk also read and critiqued it with their scrupulous editor-eyes.

Betty Colonomos contributed clever observations concerning the interaction of facial behaviors and head movements in ASL sentences as well as helped with the translations. Chi Lee developed the computer program, with the assistance of Wally Friesen, for the timeline displays of facial behaviors. Frank A. Paul (FAP) did all of the sign drawings and Tom Klagholz took the photographs that were borrowed from the Baker/Cokely ASL series. The Transcription Symbols photos were done by Frank Werbickas, Charlie Shoup, and Chun Louie. I am grateful to each of these for contributing their skills and time--especially to Nancy Montillo who did all of the typing, working long hours while very pregnant. May her child never again have to endure such stress!

I also want to thank the Linguistics Department at UC-Berkeley (including Mrs. Seegmiller and Mrs. Odegaard) for the education and support I received there, especially to Chuck Fillmore, Robin Lakoff, and John Gumperz whose encouragement and enthusiasm helped me get started. Another member of my

committee, Ursula Bellugi, has also for many years offered support and a rare opportunity for critical review.

Thank you NSF for grant #BN578-13734 which provided three years of funding for this project.

And saving the best for last as always, I want to thank my family, my community of friends (you too, Michele!), and my husband, Phil, for their patience and stubborn support and for really caring about the work I do.

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*Does not include photographs in Transcription Conventions.

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*Does not include drawings in Transcription Conventions.

TRANSCRIPTION CONVENTIONS

A. Manual Behaviors

- (1) An English gloss for an ASL sign is written in capital letters (e.g. CURIOUS).
- (2) When more than one English word is needed to gloss an ASL sign, the English words are separated by a hyphen (e.g. FROM-NOW-ON).
- (3) When an English word is fingerspelled, the letters in the word are separated by a hyphen (e.g. J-O-H-N).
- (4) When the sign is a fingerspelled loan sign (Battison 1978), the gloss is preceded by the symbol '#' (e.g. #WHAT).
- (5) Double quotes around a gloss indicate a conventional "gesture" (e.g. "WHAT").
- (6) The symbol '(2h)' means the sign/gesture is made with 'two hands' although it could be made with only one (e.g. (2h)"WHAT").
- (7) When two glosses are joined by the symbol '~', it indicates a compound sign (e.g. TRUE~WORK).
- (8) When two glosses are joined by the symbol '⌢', it indicates a contraction (e.g. NOT⌢(2h)HERE).
- (9) An asterisk after a gloss indicates the sign is stressed (e.g. BORED*).
- (10) A plus sign after a gloss indicates the sign is repeated. The number of plus signs indicates the number of repetitions (e.g. DIFFERENT+++ indicates the sign is repeated three times; the sign illustrated here is also made in an 'arc').
- (11) The symbol 'alt.' means the hands move in an 'alternating' manner (e.g. (2h)alt.COMPLAIN).



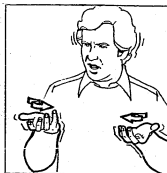
CURIOUS



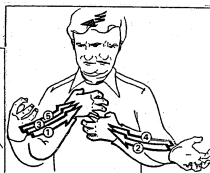
FROM-NOW-ON



#WHAT



(2h) "WHAT"



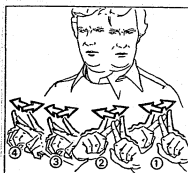
(2h) alt. COMPLAIN



TRUE ~ WORK



BORED*



DIFFERENT+++ -arc



NOT ~ (2h) HERE

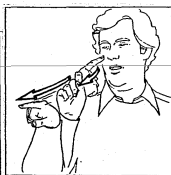
- (12) Double quotes around a word(s) in lower case which is written after a gloss indicate an inflection of the sign (e.g. BECOME-SICK"regularly").
- (13) The symbol 'rt' stands for 'right'; 'lf' for 'left'; and 'cntr' for 'center'. When a sign is made 'in' or 'toward' a particular location in space, that place or direction is indicated after the gloss, as in NOTICE-TO-rt.
- (14) When a symbol like 'rt' is written before a gloss, it indicates the location where the sign began (e.g. rt-TEASE-me"over time"). (These symbols refer to the signer's perspective - e.g. 'rt' means to the signer's right.)
- (15) Since spatial locations represent nominal arguments, when the identity of the referent is known, the directions 'rt', 'lf', etc. can be replaced with the appropriate names - e.g. if the location to the signer's left is 'Pat', then you-FORCE-lf can be written as you-FORCE-pat. (For such verbs, a location approximating the front of the addressee's body means 'you'; near the front of the signer's body is 'me'.)
- (16) Classifiers are transcribed with the symbol 'CL' written after the letter or number which indicates the handshape of the classifier (e.g. C-CL; 2-CL). Sometimes an arrow is used to indicate the orientation of the palm in that classifier (e.g. B↑-CL means the palm of the B handshape is facing upward).
- (17) Single quotes around a lower case word(s) is used to help describe the meaning of a particular classifier in the context of a particular sentence (e.g. 2-CL'two people come to me from rt').
- (18) The symbol 't', written as a subscript, indicates that both hands in the classifier move or act "together" to describe the referent - i.e. both hands have equal value and there is no "dominant" hand (e.g. C_t-CL-upward"sweep in rows" as opposed to (2h)C-CL-upward"sweep in rows").
- (19) Signs made with the non-dominant hand are written on a line below the normal line. If one hand makes a sign and then 'holds' it in place while the other hand makes another sign, the period of 'holding' is indicated with a horizontal arrow, as in:

NOT-MUCH

5:-CL----->



BECOME-SICK"regularly"



NOTICE-TO-rt



rt-TEASE-me"over time"



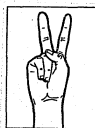
2-CL'two people come up
to me from rt'



you-FORCE-pat



NOT-MUCH
5:-CL----->



2-CL



C_t-CL-upward"sweep in rows"



C-CL



C-CL-upward"sweep in rows"

B. Nonmanual Behaviors

When particular nonmanual behaviors have been identified as members of a linguistic signal in ASL, that signal may be assigned a letter (e.g. 'q') or letters (e.g. 'neg'). When transcribing ASL utterances, those letters are then used to represent that particular combination of behaviors. The letter is written at the rightmost end of a line which is above one or more sign glosses. The line indicates the period during which those behaviors were present. For example, in the first sequence below, the behaviors in 'q' occurred during the signs UNDERSTAND YOU, whereas they occurred throughout the entire utterance in the second sequence.

(a) LECTURE UNDERSTAND YOU^q

(b) LECTURE UNDERSTAND YOU^q

If more than one nonmanual signal occurs at the same time, the corresponding letters are conjoined with a plus sign.

(c) LECTURE UNDERSTAND YOU^{neg+q}

What follows is an illustration reference showing all of the primary actions of the face, head, and torso which are distinguished in the data and used in the analyses presented in Chapter V. These actions are described in more detail in IV.2.

- (1) Face - the numbers correspond to "action units" (AUs) in Ekman & Friesen's (1978a) Facial Action Coding System.



Neutral



Neutral



1+2 'x'

1+2



1+2 'y'



4



4+5



1+2+5



1+2+4



1+2+4+5



1+2+4+5

xx



1+4



1+4+5



1+2+4



1+2+4+5



12x



6+12x

(2) Head



neutral



tilt forward



tilt forward+chin jut



tilt downward



tilt forward+downward



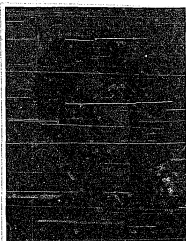
neutral



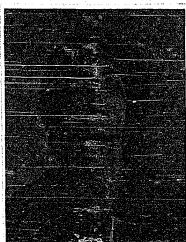
retract back



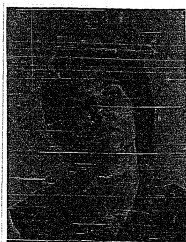
turn right



tilt right



tilt back



tilt right+back

(3) Torso/Body



lean forward



lean right



shift into right



face right

Chapter I

EXPERIENCES OF DEAF PEOPLE IN A HEARING WORLD

1.0 Formal education of deaf people: historical overview

1.1 Beginnings

Although the presence of congenitally deaf people in human societies has been recognized since at least 1550 B.C. (Moore 1982), all such societies, up to the sixteenth century seem to have viewed deaf people as inherently uneducable. This view is reflected in the Koine Greek word *κωφός* which is used repeatedly in the gospel of St. Matthew to refer to a deaf person or a mute person and which means 'deaf and dumb (mute)' but negatively connotes the state of being 'dull of mind' (Peet 1851). It is seen in the Justinian Code (A.D. 530) which denied to those individuals congenitally deafened and non-speaking the right to make a will or bequest (Peet 1851). And it is seen in the laws of most European nations in the middle ages, which imposed severe civil and religious disabilities on deaf people, depriving them of their inheritance rights and their right to marry (unless they obtained papal dispensation) and not allowing them to receive Communion (Deland 1931, Peet 1851).

The end of what Moore (1982) calls the "dark ages of the deaf" began when a humble Benedictine monk, Pedro Ponce de Leon (1520-1584), became the first teacher of deaf children, establishing a school for such children of wealthy families at the Monastery

at San Salvador de Oña in Spain. Contrary to popular and traditional beliefs concerning deaf people, Fray Pedro found his students to be "mentally alert and quite capable of learning" (Chaves and Soler 1974). The monk's methods of teaching seem to have focused on reading and writing, later followed by speech, using a manual alphabet (similar to that seen today in the United States) as an aid to instruction. Chaves and Soler (*ibid.*) argue that the monk probably also used signs to communicate with his students. Benedictines had long before developed a system of signs to enable communication while maintaining their customary silence. Fray Pedro very likely knew these signs and used them with the deaf children.

By his own account, Fray Pedro taught his students how to "read and write, count, pray, serve at Mass, understand the Christian doctrine, confess orally, and to some [I taught] Latin and others Latin and Greek and to one even Italian" (*op.cit.*:53). He also tutored some of them in philosophy, astronomy, politics, and history.

The monk's success and similar accomplishments of two other Spanish educators, Juan Pablo Bonet and Manuel Ramirez de Carrion, who taught deaf students in the first half of the seventeenth century, led to an interest in the education of deaf people in Great Britain. Using techniques similar to their Spanish predecessors, William Holder and John Wallis began to teach individual deaf students in the years 1659 and 1660, respectively (Moore 1982). Both advocated the teaching of writing before teaching speech. Like Fray Pedro, Holder used a manual alphabet (this

time, a two-handed alphabet unlike the one-handed system in Spain) to teach speech sounds. However, Wallis used both the "natural gestures" of his pupils and the two-handed alphabet for communication, teaching speech through other means.

In 1680, George Dalgarno, a contemporary of Holder and Wallis, wrote a powerful treatise on the education of deaf people. He argued that deaf people had the same potential for learning as hearing people and could obtain the same level of functioning if properly educated. Thus, the first schools for deaf children in Great Britain opened their doors in the middle of the eighteenth century.

These schools were largely dominated by three generations of the Thomas Braidwood family - who kept their methods a family secret in order to maintain their monopoly. One account of the Braidwood program, published by a nephew, Joseph Watson, in 1809, says that it "incorporated the two-handed alphabet, gestures and natural signs, and reading and writing" and developed speech by teaching first sounds, then syllables and words (Moore 1982). However, Lane (1976) writes that "sign was anathema" in the Braidwood schools and that instruction was avowedly oral. In any case, the British schools increasingly became known as oral schools and have remained that way with little change to the present date.

The eighteenth century also brought the beginnings of education for deaf people in France. Jacob Rodriguez Pereire (1715-1790) was the first well-known teacher there, although one of his first students, d'Azy d'Etavigny, was said to have been previously

instructed for seven years by an unknown deaf teacher in Amiens (Moore 1982). Pereire concentrated on teaching speech through the sense of touch (Lane 1976, citing Sequin 1876). He opened a small school in 1753 in Paris and, in large part, kept his methods a secret, planning to pass them on to his family. However, at the time of his death, the family was not sufficiently familiar with his techniques; thus, the school died with him.

A contemporary of Pereire, the Abbé Charles-Michel de l'Épée (1712-1789), was nearly fifty when he began the work which would make him world-reknowned as an educator of deaf people. By chance, he was asked to assist in the instruction of two deaf daughters of a woman he knew in Paris. Perhaps aided by John Locke's famous essay published in 1700 and again in 1742, Épée saw that the girls' fluent, meaningful signing with each other constituted the use of a "natural language" particularly well suited to the needs of deaf people. He reasoned that if the connection between words and their referents was arbitrary, then gestures/signs could serve equally well (as words) for the purpose of communication and education (Lane 1977).

Thus, the abbé took the signs of his pupils and, for the purpose of instruction, added to them a set of signs which he called "les signes méthodiques" (methodical signs). These were designed to represent various root morphemes in written French, as well as those morphemes which serve grammatical functions, such as 'le' and 'la'. By the time Épée had completed his system and established a school in Paris in the 1760's, "all the words of the French language had their counterpart in that of the deaf"

(Sicard 1800, noted in Lane 1976). Students were then trained as copyists, rendering written French into signs and signs into written French and, with some, into written Latin, Spanish, and Italian.

An example of how the methodical signs were used is recorded in Berthier's (1840) record of a public demonstration featuring Epée's system. Epée dictated in sign the word 'inintelligibilité' (unintelligibility) to his students - who immediately correctly transcribed it in written French. Epée explained,

I needed only five signs performed in an instant, as you have seen. The first announced an internal activity; the second represented the activity of someone who reads internally, that is, who understands what is said to him; the third declared that this arrangement was possible. Doesn't that give the word 'intelligible'? But with a fourth sign, transforming this adjective into an abstract quality, isn't 'intelligibilité' the result? Finally, by a fifth sign, adding negation, do we not have the entire word 'inintelligibilité'?
(from Lane 1976, note on p. 327).

The merits of Epée's system were later critiqued by his successor, Abbé Roche-Ambroise Sicard of Bordeaux, as producing mere copyists rather than writers who understand the meaning of what they are writing (Lane 1976:87). Under Sicard, instruction made less and less use of methodical signs and more and more use of the students' signs.

However, Abbé de l'Epée made another powerful contribution to deaf people -- in addition to recognizing that "the natural language of the Deaf and Dumb is the language of signs" (Lane 1976:79). In opening his school, which soon became the National Institute for Deaf-Mutes, Epée brought together formerly isolated deaf people into a signing community. This made it possible for

deaf people to share their knowledge and their values with each other -- and to develop a more conventional, shared signed language which became known as French Sign Language.

Jean-Marc Itard, physician to the institute, later commented on these developments in the following description of Epée's school.

A large and seasoned institution of deaf-mutes, bringing together individuals of diverse ages and degrees of education, represents a genuine society with its own language, a language endowed with its own acquired ideas and traditions, and which is capable, like spoken language, of communicating directly or indirectly all its intended meanings. In fact, the deaf-mute raised in the midst of such a gesturing society sees not only the signs that are made to communicate with him but also those that are exchanged in conversations among the deaf that are within his view. [The impact of this indirect communication] explains how these children who have only been taught the names of objects, after several months in a large institution, can conduct sustained animated little conversations with their peers that require a knowledge of [how to sign] adjectives, verbs, and tenses... Comparing our current deaf-mutes with those first pupils trained in the same institute, by the same methods under the same director, we are led to recognize their superiority which can only be due to their having come later, at a more advanced stage of the signing society.

(Itard in Lane 1976:209-210)

Epée viewed speech as a mechanical operation that required inordinate amounts of deaf students' time to learn. He thought it more important to focus on the development of intellectual capabilities and spiritual concerns. Thus, Epée gave less and less attention to teaching speech and was strongly attacked by his speech-focused competitor, Pereire, and by another contemporary who became known as the originator of the German method, Samuel Heinicke.

Heinicke established a school in Leipzig in 1778. Like most of the early educators (except Epée), he was secretive about his techniques and many of them were lost with his death in 1789.

Heinicke opposed the use of methodical signs and the teaching of writing before speech. He said the latter went against the natural order of learning and that clear thinking was possible only through speech (Garnett 1968).

The two men responsible for perpetuating and spreading the German, or oral, method were John Graser (1766-1841) and Frederick Hill (1805-1874). Both strongly opposed the use of manual communication and believed that speech should be the vehicle and foundation for all learning. Graser also decried the isolation of deaf children in institutions and residential schools (Gordon 1885). He proposed and initiated the integration of deaf children in public school programs in several German states, beginning in 1821. However, this system was abandoned after a few years due to the deaf students' poor academic progress (Bender 1970, Gordon 1885).

Thus, the context predating the development of educational programs for deaf people in the United States is one of increasing differentiation and polarization of schools as either "oral" or "manual". The strongest proponents of the oral method were the Germans; the strongest advocates of the manual method were the French. Educators in these two countries also considerably influenced the spread of similar programs in other countries in the eighteenth and nineteenth centuries - for example, Austria, Belgium, Italy, and Sweden.

The first permanent school for deaf students in the United States was established in Hartford, Connecticut in 1817. At that time it was called the American Asylum for the Education of the

Deaf and Dumb (now the American School for the Deaf). Thomas Hopkins Gallaudet served as principal while Laurent Clerc, a French deaf man trained at the Paris institute, became the school's first teacher.

Gallaudet, a Yale graduate who earlier planned to become a minister, had been sent to Europe in 1815 by community leaders in Connecticut to study various methods for teaching deaf children. First rebuffed by the Braidwoods in Great Britain who refused his several alternative plans for studying their techniques, Gallaudet went to Paris to study with Sicard, Epée's successor. There Gallaudet also attended classes taught by two highly successful former students at the school, Jean Massieu and Laurent Clerc. Gallaudet convinced Clerc to return with him to the United States and become the Hartford school's first teacher. Thus, not only was the French, or manual, method imported to America, but also the tradition of hiring deaf teachers. Here arose another point of difference from the British and German systems which opposed the employment of deaf persons as teachers.

In addition to teaching deaf students, Clerc also trained the hearing people who later became directors of similar schools in New York (1818), Pennsylvania (1820), Kentucky (1823), Ohio (1829), Missouri (1838), Virginia (1839), and Quebec. Later, deaf individuals founded a number of schools across the country, for example, in Arkansas, Florida, Indiana, Kansas, New Mexico, and Oregon (Jones 1918). By 1851, 36 percent of the teaching staff in American schools were deaf; by 1870, the percentage had increased to 42.5.

Then dramatic changes began to overturn the system of education for deaf students in the United States. Before addressing the substance and impact of these changes, we need to attend to several questions about the language(s) used at the American schools up to this time.

1.2 Signing at the French and American schools

As previously stated, Epée at the Paris institute had employed a combination of signs taken from the deaf students and many of his own invented "methodical signs" to try to represent gesturally the structure of written French. Sicard had found this system to be slow and laborious. He also saw that students didn't understand the meaning of what they were signing when using this system or when "copying" into written French from the signs.

In contrast, Sicard developed successful strategies for teaching the meanings of words and signs via drawings and moving around various objects. His gradual compromise with Epée's system of methodical signs resulted in what Lane (1976) has called "Signed French". With some exceptions, the signs followed the word order of French. As much as possible, the lexicon came from the students' French Sign Language although many methodical signs were retained to represent French grammatical words and word endings. Sentences in written French were still transposed into Signed French. However, the meaning of each sentence was first explained in French Sign Language.

This was the methodology that Clerc brought to the first classroom in Hartford. During the voyage from France to America, Clerc had continued teaching signs to Gallaudet whereas Gallaudet taught Clerc how to read and write English. Clerc then tried to modify his Signed French to fit better the word order and grammatical structure of English, resulting in "Signed English" (Lane 1976).

Outside the classroom, however, the American deaf students regularly used a different form of signing - just as the French deaf students had in Paris. Gallaudet himself noted the differences between the classroom and peer group forms of signing when he wrote in 1819:

A successful teacher of the deaf and dumb should be thoroughly acquainted both with their own peculiar mode of expressing their ideas by signs and also that of expressing the same ideas by those methodical signs which in their arrangement correspond to the structure of written language. For the natural language of this singular class of beings has its appropriate style and structure. They use it in their unrestrained communication with each other...

(Gallaudet, in Lane 1980:10)

Was this "natural language" French Sign Language (FSL), another import via Clerc? Until 1976, most writers said "yes", that our present-day American Sign Language (ASL) came directly from FSL. Then James Woodward presented strong evidence from various comparisons of old and modern ASL signs with old and modern FSL signs, finding that approximately 40 percent of ASL signs were not cognate with FSL signs. His use of glottochronology found this percentage much too high to be accounted for by natural processes of language change over the 150-160 year period.

Woodward also discovered significant phonological and syntactic differences between the two languages, leading him to hypothesize a creolization of FSL with existing sign varieties in the United States (Woodward 1978).

This hypothesis has been confirmed by a variety of sources, including the recent discovery of a relatively closed community of deaf and hearing people who inhabited Martha's Vineyard during the late 1600's to early 1900's. They quite naturally used a signed language for their interactions, and several of their deaf children attended the Hartford school (Groce 1980). Finally, Clerc himself (unhappily) commented on these changes from his native FSL in various letters written during his tenure at the Hartford school (available in the collected writings of L. Clerc, Gallaudet College Library).

Returning to the subject of classroom methodology, we find that Clerc and Gallaudet initially advocated the use of Signed English in the same way that Sicard was using Signed French. First the written (in this case, English) sentence was presented and its meaning explained in the "natural" signed language; then it was presented in Signed English.

However, it gradually became clear, on both sides of the Atlantic, that this multi-step procedure was not only unwieldy but unnecessary. R.A. Bébien, who became director of the Paris institute after Sicard's death in 1822, proposed dropping the Signed French step and using simply FSL and written French in the classroom. By mid-century, when the director of the New York school visited Paris, he reported back that the methodical signs were no longer in use (Rae 1852).

Similarly, by 1835, Signed English was officially abandoned in the Hartford and New York schools as well as in most (if not all) schools throughout the United States (Lane 1980, citing Peet 1857). Lane writes that "there were 26 American institutions for the education of the deaf in 1867, and ASL was the language of instruction in all 26" (1980:11). Similarly, he states that FSL was the accepted language in all 160 schools in France by 1845.¹

However, this general appreciation of the educational benefits of using the "natural" signed languages and the related widespread employment of deaf teachers was completely overturned by the beginning of the twentieth century.

1.3 Spread of oralism

Proponents of what was later labeled and more clearly defined as "oralism" had always been around - in both France and the United States, as well as in Great Britain and Germany. It seems that as advocates of the "manual" philosophy became "more manual", that is, more articulate in their arguments against using classroom time for speech training and more clearly wedded to using the deaf students' own language for classroom communication, the "oralists" became "more oral". Whereas Heinicke

¹Present-day experience suggests that the form of signing used by the hearing teachers for whom ASL or FSL was not a native language may have been more influenced by the structure of their native languages and hence, less like the ASL or FSL used by the deaf students and deaf teachers. However, this does not contradict Lane's basic point that these languages were accepted and used as primary modes of communication inside (as well as outside) the classroom.

(according to Garnett 1968) and mentors of the Braidwood program (by Watson's 1809 account) were not opposed to the use of "natural signs" and the manual alphabet in the late eighteenth and early nineteenth centuries, educators soon thereafter in Great Britain and Germany were calling for a total prohibition against the use of manual communication in the classroom.

In 1834, Ordinaire, then director of the Paris school tried to supplant FSL with spoken French, but failed when the majority of teachers opposed him (Lane 1980). In the 1840's, two leading American educators, Horace Mann and Samuel Howe, visited the oral schools in Germany and returned praising them and recommending the establishment of an oral school in Massachusetts. Representatives from the Hartford and New York schools, George Day and Harvey Peet, also then visited the German schools, but returned much less impressed, finding the oral method very weak for education and for moral and religious instruction (Moores 1982). However, some of the "manual" educators did see some value in providing speech training to students with only partial hearing losses, especially those deafened postlingually (i.e. those who became deaf after acquiring a spoken language). Lane (1980) reports that by 1845, thirty of the 182 Hartford students and forty of the New York students were receiving speech training. In the 1860's, two oral-only schools were opened in the United States, one in New York (the Lexington School for the Deaf, formerly the New York Institution for Impaired Instruction) and one in Massachusetts (the Clarke School, formerly the Clarke Institution for Deaf Mutes).

This period in American history was greatly influenced by two other famous educators, Edward Miner Gallaudet (1837-1917), T.H. Gallaudet's son, and Alexander Graham Bell (1847-1922). Each had a deaf mother and a deaf wife. In 1857, E.M. Gallaudet became principal of a new manual school in Washington called the Columbia Institution for the Deaf and Dumb. In 1864, Congress established a collegiate department at the Columbia Institution called the National Deaf Mute College (which later was renamed Gallaudet College) and Gallaudet became its president.

At that time, Gallaudet argued for more attention to the development of deaf students' speech skills, contending that sign language was used to excess (1868, 1871). Clearly, his voice was pivotal in gaining acceptance of a combined oral-manual philosophy. (At that time, the "combined" approach meant either using speech at some times and signs at other times or using speech and signs at the same time.)

In his early years, A.G. Bell taught speech, using a system developed by his father called Visible Speech, and demonstrated his methods at the Clarke school and Hartford school. Bell received the patent for his invention, the telephone, in 1876, and, three years later, moved to Washington, D.C. where he met E.M. Gallaudet. In 1880, Bell received an honorary Ph.D. from Gallaudet College (Moores 1982).

The year 1880 was also a turning point worldwide in the field of "deaf education" (as it is now called). During that year, an International Congress on the Instruction of Deaf Mutes was held in Milan, Italy. Two years earlier a smaller congress had

been held in Paris, and turning the tide in favor of oralism, had declared that only oral instruction could "fully restore the deaf to society" and hence was the educational method of choice, although manual communication was a useful auxiliary (Lane 1980).

The Milan Congress took the final step. All of the 164 delegates were hearing. The two days preceding the convention and every afternoon during the convention were devoted to public examinations of the two schools for deaf students in Milan. Both schools were oral-only, having changed from their manual methods ten years previously.

The demonstrations were so impressive that one English delegate later wrote "the victory for the cause of pure speech was in great measure gained, as many were heard to say afterwards, before the actual work of the congress began" (Hull 1881, in Lane 1980).

However, E.M. Gallaudet and a few others felt they had been tricked. Gallaudet wrote that the deaf students' responses:

were in many instances begun before the examiner had completed his question. That no real examination was made by outside persons; that many pupils were asked very few questions while certain others were examined at great length; that these discriminations were made by the teachers in every instance; that no information was given as to the history of any pupil that is to say, as to whether deafness was congenital or acquired, and whether speech had been developed before hearing was lost or not. That the impression was thus sought to be conveyed that all the speech possessed by all the pupils had been imparted to them by their teachers, which was certainly not the case. (1881: 4)

In any case, ending with the cry "Vive la parole!", all but the Americans voted in favor of the following resolutions:

*The Convention, considering the incontestable superiority of speech over signs, for restoring deaf-mutes to social life [and], for giving them greater facility of language, declare that the method of articulation should have preference over that of signs in the instruction and education of the deaf and dumb.

*Considering that the simultaneous use of signs and speech has the disadvantage of injuring speech and lip-reading and precision of ideas, the convention declares that the pure oral method ought to be preferred.

(Gordon 1892, cited in Lane 1980:15).

Also in 1880, the National Association of the Deaf was founded in the United States by outraged deaf people who sought to preserve their language. By the end of the 1880's, there were eleven strictly oral schools in America. By 1887, all of the deaf teachers in France had been dismissed (Markowicz 1977-78).

Then, in 1900, another International Congress was held in Paris. A report read there stated that the pure oral method had become the official method of instruction in all schools for "deaf-mutes" in France (Lane 1980). Most of the delegates from other countries were able to report the same.

E.M. Gallaudet was again on hand at this convention, now strongly contesting the merits of the oralist approach and arguing that its supporters were primarily hearing teachers whereas the supporters of sign language were the deaf people themselves. At the congress, the deaf teachers were forced to meet separately from the larger body on the pretext that the official language

of the congress was French whereas the deaf group communicated in signs. The president of the congress refused to allow motions passed in the deaf group even to be reported in the hearing group (Lane 1976).

Finally, Gallaudet made a proposal to the congress in favor of a "mixed method" of instruction (an approach to education which resurfaced in the 1960's under the name Total Communication). He proposed "to tailor the method to the intellectual and physical aptitudes of the individual pupil, to provide initial oral instruction to all but to continue this mode of instruction only for those who benefit by it" (Lane 1976:253). The congress rejected the motion by more than one hundred to seven.

In the end, the meeting resolved in favor of the conclusions of the Milan congress. The deaf teachers separately resolved the opposite. When Gallaudet then moved that the resolution read that the hearing section, rather than the congress, considers speech incontestably superior to sign, the motion was defeated.

The spread of oralism in the United States owed much to the money and prestige of A.G. Bell. In 1887, Bell founded the Volta Bureau in Washington, D.C. with an endowment of \$200,000 for the dissemination of knowledge concerning deafness (Moores 1982). Bell also helped begin a journal (now called the Volta Review) and a teachers' organization (formerly the American Association to promote the Teaching of Speech to the Deaf, now called the A.G. Bell Association for the Deaf, Inc.) competitive with the older convention of American Instructors of the Deaf, which was

established in 1850. The relationship between these two organizations remains "uneasy" to this day.

Concerning programs for deaf children, Bell recommended the elimination of educational segregation (residential schools), the "gesture language", and deaf teachers. In his view, elimination of these was necessary in order to prevent the "tragedy" of congenitally deaf people marrying each other and producing a "defective race of human beings" (1884: 41).

In large part, Bell and other oralist supporters were successful in diminishing two of the conditions - (a) the elimination of deaf teachers, which dropped from 42.5 percent in 1870 to 14.5 percent in 1917 (Jones 1918), to 11.7 percent in 1961 (Doctor 1962), and (b) the elimination of manual communication in schools, which gradually became more and more oral-only during the first half of the twentieth century. Residential schools resisted this full swing for many years (e.g. only seven out of sixty were purely oral in 1908) whereas the day schools shifted quickly (e.g. all but one of them were oral-only in the same year) (Fay 1909). By 1965, all programs for elementary age children were, officially, completely oral, as were the majority of programs for older children.

1.4 Spread of manual codes

However, by the late 1960's, the field was ripe for another major shift. Educators had become increasingly dissatisfied with oral-only education and disappointed with the apparent, poor impact of preschools using the oral method (Moores 1970). On the

other hand, a series of studies (Stevenson 1964, Stuckless and Birch 1966, Meadow 1968, Vernon and Koh 1970) had recently been published finding that deaf children of deaf parents, who were exposed to "manual communication", were superior to deaf children of hearing parents in reading, writing, general academic achievement, and social maturity. They also showed no differences in their overall speech skills.

The tide quickly turned. Jordan, Gustason, and Rosen (1976) reported that 302 programs in the U.S. abandoned oral-only instruction during the years 1968 to 1975. During that same period, 333 programs changed to Total Communication, defined by the investigators as the use of manual signs, fingerspelling, speech reading, and amplification. A follow-up study by the same team (1979) found a continuation of that trend over the ten-year period from 1968 to 1978. During that period, 481 programs abandoned oral-only instruction, and 538 programs (including every level - preschool, elementary, junior high, and senior high) changed to Total Communication.

What form of signing did these programs rapidly embrace? Manual codes for English - manual codes which, in theory, can be used while speaking English. Now although some of the programs at the junior and senior high levels are basically using "traditional signs" (i.e. unchanged signs taken from ASL) in English word order, the majority at the preschool and elementary levels are using codes first developed in the early 1970's. Some of the better known, invented codes are Seeing Essential English (Anthony 1971), known as SEE I, Signing Exact English (Gustason,

Pfetzling, and Zawalkow 1972) known as SEE II, Linguistics of Visual English (Wampler 1972), known as L.(O.)V.E., and Signed English (Bornstein et al. 1975), a system specifically developed for use with preschool deaf children.

Many of the basic principles of these codes are the same; indeed, developers of the first three listed originally worked together. Each basically claims to use ASL signs, plus some (from nine to well over fifty) invented signs designed to represent grammatical morphemes in English. Baker and Cokely (1980) have argued that this claim is, at best, highly misleading. Of the relatively small number of signs that the codes borrow from ASL's available lexicon, many are phonologically restructured. In particular, the handshapes of signs are often changed, and their movements highly restricted. The codes frequently assign grammatical roles to the signs which are different from the roles they serve in ASL. Even more significant, the meanings attributed to signs in the codes are often very different from their meanings in ASL. Finally, the codes are manual only, and do not include any of the non-manual behaviors which characteristically accompany ASL signs and sentences.

The goal of designers of the manual codes was to provide a manual representation of the lexicon and syntactic structure of English. Their underlying assumption, still widely held today, was that deaf children would be better able to learn English if they regularly saw and used a manual representation of the English language. To date, there is no scientific evidence that this assumption is indeed true. On the contrary, the available

research shows that hearing teachers and parents use the codes quite inconsistently and, hence, are not providing consistent models of English (Crandall 1974, Marmor and Petitto 1979, Baker 1980a, Kluwin 1981). Baker (1980a) argues that major differences in the rate of production of speech as opposed to sign, and the considerable cognitive as well as physical demands placed on the person who is attempting to speak English while using a manual code, make it highly unlikely that such codes can be used successfully according to their own principles. As the reader may have imagined, the ongoing debate is strikingly reminiscent of that waged in the early 1800's concerning methodical signs!

1.5 Spread of sign language research

At the time when schools were moving away from oral-only practices and toward the use of manual communication, no serious attention was given to the option of using American Sign Language. In fact, most educators viewed it not as a language, but as a form of "deaf slang" or "broken English" that was highly "idiomatic" and "ungrammatical". Through the years, as rare proposals were made to consider its use, they were consistently rejected: that type of signing would hinder deaf students from learning English - the same genre of argument used in 1880 against all forms of manual communication in favor of speech only (and still used, in the same way, by the A.G. Bell Association today).

However, as the schools were rapidly embracing forms of "Signed English", a handful of linguists and psychologists were

initiating increasingly intensive studies of the form of signing deaf people continued to use with each other. William Stokoe, an English professor at Gallaudet College had begun a phonological analysis of ASL signs way back in 1957 when he noticed that signs seemed to have distinctive parts. They were not simply "pictures drawn in the air", as widely believed. His resultant 1960 monograph, Sign Language Structure: An Outline of the Visual Communication Systems of the American Deaf, drew positive interest from academic circles outside "deaf education" but not from those inside. In fact, the inside circles were displeased. As Stokoe himself describes it:

Publication in 1960 brought a curious local reaction. With the exception of Dean Detmold and one or two close colleagues, the entire Gallaudet College faculty rudely attacked me, linguistics, and the study of signing as a language. My function was to teach English they told me in a meeting to which I had been invited to talk about the occasional paper. If the reception of the first linguistic study of a Sign Language of the deaf community was chilly at home, it was cryogenic in a large part of special education--at that time a closed corporation as hostile to Sign Language as ignorant of linguistics. Even the general public joined in the outcry. One instance: When the National Science Foundation first granted support for research in Sign Language, two letters attacking the foundation, the grant, and the research purpose appeared in the Washington Post. Both letter writers, descendants of A.G. Bell, based their objections on the claim that grandfather had proved once for all that Sign Language is useless and pernicious in the education of the deaf...

(Stokoe 1980: 266-267)

In 1965, Stokoe and two deaf colleagues, Dorothy Casterline and Carl Croneberg, published a Dictionary of American Sign Language on Linguistic Principles which provided the descriptive tools for other future researchers in the United States and abroad to study signs. In 1970, a Laboratory for Language and Cognitive

Studies was established, with Ursula Bellugi as director, at the Salk Institute for Biological Studies. Its focus was initially the acquisition of American Sign Language by deaf children. In 1971, Stokoe left the English Department and became director of a newly established Linguistics Research Lab (LRL). The same year, he began publishing a newsletter on topics relating to signed languages, and James Woodward, also at the LRL, presented the first paper on ASL at a Linguistic Society of America conference.

The "sign language revolution" was solidly on its way - not only in the United States, but in countries all over the world where individuals inspired by Stokoe's work began to study the signed language of deaf people in their own communities. By 1979, when the first International Symposium on Sign Language Research was convened in Stockholm, studies of some twenty different signed languages were in process with another ten identified but not yet investigated.

1.5.1 Reactions of the public and the professionals

During the past decade, public interest in signed languages has also skyrocketed (Cokely 1980). In the United States, the tremendous demand for courses in "sign language" (which in practice has had a wide variety of meanings) led to the establishment of an organization for sign language teachers, Sign Instructors Guidance Network, in 1975, the beginnings of training and certification of those teachers, and the initiation of a series of conferences for disseminating information called National Symposia on Sign Language Research and Teaching. The third symposium in

Boston, in 1980, drew over 600 professionals from the more than 100 colleges and universities where "sign language" is taught (Cokely 1982).

However, reaction to this explosion of interest and information within the community of "deaf educators" -- which is dominated by a vast hearing majority (Craig and Craig 1980) -- has been, at best, ambivalent and, more typically, hostile. The primary focus of most educators has been the teaching of English, and a deaf student's English skills have generally been equated with his/her intelligence (Stevens 1980). Many teachers have feared that focus on ASL will detract from the learning of English (Baker and Cokely 1980) - which deaf students, as a group, do poorly, according to hundreds of pages in the American Annals of the Deaf and Teaching English to the Deaf and countless papers at the biennial Conference of American Instructors of the Deaf (CAID). Another major factor is that most teachers do not know ASL (Woodward 1980). Very few teacher training programs require as much as a course in ASL, and, to my knowledge, only one requires some level of competence in the language prior to graduation. (The CAID does not require any type of sign skills for its certification.)

However, during the past five years, some attitudes have been changing as individual teachers on their own have sought to upgrade their knowledge and signing skills. Dennis Cokely (personal communication) estimates that there are over two hundred teachers across the country who would be interested in using ASL in the classroom if given administrative approval and support. However, as of yet, there are no schools or programs willing to explicitly build this use of ASL into their program design.

1.5.2 Reactions of the deaf community

A context where the "sign language revolution" has had considerable impact is the Deaf community (Baker and Battison 1980). Here it has been felt most significantly in the areas of social and personal identity and self-worth. To understand this, imagine the cumulative social impact of almost a full century of censorship of ASL, of several generations of deaf children physically punished or severely rebuked and embarrassed for using their peer group language, and, in some cases, the language of their parents.

In 1975, Allen Sussman, a deaf psychologist, addressed the topic of "attitudes toward deafness" for the Commission on Psychology at the VIIth World Congress of the Deaf and concluded:

The deaf individual sees the non-acceptance, rejection, and at times, vilification, of the sign language as a devaluation of himself, since it is...his chief means of communication, and often the very essence of his being. (Sussman 1976)

Barbara Kannapell, a deaf woman of deaf parents who is presently completing her doctoral degree in sociolinguistics said it this way:

ASL is the only thing we have that belongs to deaf people completely...ASL is very much a part of a deaf person. If you want to change ASL, or take ASL away from the person, you are trying to take his or her identity away. I believe 'my language is me'...Thus, to reject ASL is to reject the deaf person. (Kannapell 1980:111-112)

Years of rejection have taken their toll in the deaf community, as will be described in more depth in the next section. However, as Sussman (1976) observes, "the recognition, acceptance, and respect accorded to [ASL] of late by hearing people" has

encouraged deaf people toward "greater self-acceptance and self-esteem". For the first time in the memory of those alive today, deaf students and adults are openly talking about their language and their culture with pride and a sense of excitement (Bienvenu 1982).

2.0 Attitudes of Hearing people toward Deaf people¹

Examination of popular myths concerning the history of French and American Sign Language reveals much about attitudes of the educational establishment toward deaf people. For example, consider the following three myths generally believed up until five years ago:

- (a) Abbé Charles-Michel de l'Epée created the Sign Language subsequently used by deaf people in France (i.e. French Sign Language).
- (b) Thomas Hopkins Gallaudet brought French Sign Language (FSL) to America.
- (c) Deaf people in America had no signed language until Gallaudet gave them FSL. (Thus, FSL is the sole parent of ASL.)

This rendering of history thus finds that a hearing man created a signed language for deaf people in France (who presumably had no language prior to Epée's creation) and that another

¹In the following sections, the words "deaf" and "Deaf" will appear. When not capitalized, the word refers to people who have a hearing loss. When capitalized, the word refers to deaf people who are members of the ethnically Deaf group (Markowitz & Woodward 1978, Johnson & Erting 1982). The capitalized form is used in contexts where it is helpful to highlight this ethnic dimension of Deaf people's experience.

hearing man brought this signed language to America so deaf people there would have a way to learn and communicate.

As described in the previous section, the facts, of course, are quite different: French Sign Language emerged through the interactions of French deaf people. Epée did invent a set of "methodical signs", many or most of which fell into disuse in later years. As Sicard himself wrote "neither I nor my illustrious teacher [Epée] is the inventor of sign language (it must be said)..." (Lane 1977: 5). Secondly, a French deaf man, Laurent Clerc, became the first teacher of French signs and model of French Sign Language in America. And thirdly, many deaf people in America were already using some form of signing. We know this from letters at the time referring to the existence of such signs and from recent reports on the signed language of Martha's Vineyard, dating back to the seventeenth century.

We also can assume the existence of some form of signed language since there were at least 2000 deaf people in America during the early 1800's (Lane 1977) and over 6000 by 1830 (Schein and Delk 1974). As George Veditz, a deaf former president of the National Association of the Deaf, signed in 1913, "As long as we have deaf people, we will have sign language". Later studies of signed languages all over the world (including isolated, small villages without educational facilities for deaf people - Washabaugh, Woodward, and DeSantis 1976) have proved Veditz's prediction highly probable.

So how is it that the histories of French and American Sign Language were revised to give sole credit to two hearing men?

The probable answer lies in attitudes toward deaf people held by the majority of hearing members of the education-rehabilitation establishment and, less directly, by the hearing public at large.

Markowicz (1977-78) writes that since the beginning of deaf education, there have been educators who viewed deaf people as "intellectually and morally inferior beings" on whom academic education (other than speech training) was wasted. Naturally the gestural language of this "inferior" group was also seen as much inferior to the God-gift -- speech.

Even today it is not hard to find educators who share these negative views of deaf people and their signed language. For example, Father van Uden of the Netherlands, who travels the world as an honored expert, not only views signed language as defective, but obviously classes deaf people as subhuman:

It is said, that signing is the way of communication most natural to the deaf. This is true in the sense that--without help--they will never reach higher communicative codes than signs and some attempts at lipreading and speaking. So crawling over the floor will be the way of locomotion most natural to handicapped persons with only two short stumps for legs...But now we can fit them with prostheses, by means of which they can learn to walk in a more human way, up to the same level as their fellow-men. This way of locomotion will be more natural to them as human beings. In the same sense, by good education, we can develop the attempts at lipreading and speaking of the deaf up to oral conversation, to oral language, by means of which the deaf can live with their hearing fellow-men in a more human way. And this oral language appears to be more natural to them as human beings.
(van Uden 1968:75)

Similarly, an American educator, S.R. Silverman, wrote in 1972:

It is generally agreed that sign language is bound to the concrete and is limited with respect to abstraction, humor, and subtleties, such as figures of speech which enrich expression.
(1972:405)

Although most present-day professionals in deafness related fields would not use language as crass as that of van Uden nor write as glibly about the supposed limitations of signed language as did Silverman, still the old assumptions and prejudices persist.

As Markowicz and Woodward (1978) point out, the teachers, speech therapists, audiologists, doctors, and counselors who have contact with deaf people generally view them as "defective hearing person[s]". Their identity as members of a minority culture with its own rich language has largely been ignored or denigrated, or, at least, not understood. Ignoring the impact of deaf people's different linguistic and cultural experience, and, instead, evaluating them with the same instruments and norms used with hearing people naturally has lead to various negative conclusions ranging from mental deficiency to various personality problems (Sachs 1977).

2.1 Effects on deaf people

2.1.1 Psychosocial

Sussman (1976) describes what has happened to deaf people, to their psychosocial wellbeing, after generations of such misunderstanding and prejudice. Noting that an individual's self concept is largely defined by how others view him/her, he reports the findings of numerous studies: deaf people have negative self concepts, pronounced feelings of inferiority, and low over-all self esteem. Fred Schreiber, past Executive Secretary of the National Association of the Deaf, candidly tells us one concrete and primary cause:

Throughout our school life we are taught that speech is beautiful, that speech is good; if you can't speak well, you are inferior to other people...[which] continues to this day in deaf education. As a result, the deaf person grows up with the feeling that he is inferior.

(Schreiber 1977: 79)

Sussman points to two other aspects of the negative attitudes held by hearing professionals as major causes of deaf people's negative self concept: low-expectation and paternalism. The harmful effects of low teacher expectations on student performance are now notorious (Rosenthal and Jacobson 1968). In the case of deaf children, not only have teachers traditionally held low expectations of their success, but also parents (Freeman, Carbin, and Boese 1981) and rehabilitation workers who are known for placing deaf clients in jobs "woefully below their capabilities and potential" (Sussman 1976). As a result, Schreiber (1977) says, "We are taught not to try. We are taught that trying too hard is to be a failure" (p. 80).

Paternalism is a "widespread, persistent and pernicious problem that enmeshes deaf people" (Sussman 1976: 5). Under the guise of "benevolent superiority", it "imputes inferiority status to deaf people" (ibid.). Thus, deaf people are treated more like children who need to be taken care of. And, of course, this means taking and keeping control of the institutions and projects which affect the lives of deaf people -- which then leads deaf people into the despair of "powerlessness" and "insignificance" (Trybus 1980).

Finally, as powerless people, deaf people learn to please the powerful: "I think deaf people are better actors than most

people realize. We, as deaf people, are taught to say what we think you want to hear" (Schreiber 1977:81).

2.1.2 Linguistic

The attitudes of hearing people in deafness-related fields have also strongly influenced the dynamics of language use in the deaf community. Drawing on Ferguson's (1959) explanation of diglossia and Fishman's (1972) discussion of the relationship between diglossia and bilingualism, linguists (Stokoe 1970, Woodward 1973, Erting and Woodward 1974) have described the deaf community as both bilingual and diglossic, although there is often diglossia without bilingualism in the individual. As is characteristic of diglossia, there is a stigmatized vernacular (ASL) and a prestigious second language (English - presumably realized in a gestural form called Manual English). However, code-switching actually operates along a continuum of language varieties between the extreme forms of Manual English (rarely used for conversation) and ASL. Woodward (1972) initiated the now widespread use of the label Pidgin Sign English (PSE) to refer to those intermediate varieties of signing between ASL and Manual English. (However, the accuracy of calling these varieties a "pidgin" is beginning to be questioned - e.g. Washabaugh 1981, Cokely 1983).

American Sign Language is the primary language of ethnically Deaf members of the deaf community and its use serves as the principal identifying characteristic of that ethnic group (Padden and Markowicz 1976, Markowicz and Woodward 1978).

However, as described earlier, ASL has been the subject of much criticism and misunderstanding by persons outside the Deaf group, many of whom have refused to recognize its status as a language and, in any case, have viewed its existence as threatening to the goal of having deaf people learn English.

One byproduct of this history of denigration of ASL is that, until recently, very few hearing people knew ASL. ASL became a sort of underground language, cherished for interactions of Deaf people with each other, but hidden from the view -- and interference -- of outsiders.

When in the presence of hearing people, Deaf people would (and generally still do) code-switch to a more English-like form of signing. Whereas this switching would seem to be motivated simply by a desire to facilitate communication with persons whose native language is English and who do not know ASL, in fact, it serves to maintain a safe boundary between Deaf people and those hearing persons who might otherwise learn ASL and then attempt to exert control over Deaf people's in-group interactions (Markowicz and Woodward 1978). Woodward (1975), thus, finds that the buffer provided by Pidgin Sign English has contributed significantly to the survival of ASL, despite a century of unrelenting attempts to eliminate it.

2.2 Recent changes

However, as described in the previous section, the last five years have seen the beginning of some major changes within the

Deaf community. Certain psychologists have been questioning the validity of results from tests designed for other populations but then administered without 'translation' to deaf children (e.g. Sullivan and Vernon 1979, Brauer 1980). Similarly, more recent tests using manual communication have found deaf children's cognitive skills much more like those of hearing children than has been assumed on the basis of previous studies (e.g. Rittenhouse and Spiro, 1979). Other professionals have been asserting that deaf students' generally poor academic achievement is at least as much a product of the teachers' low expectations and minimal or non-existent sign skills as anything attributable to the students (e.g. Moores 1982).

Information from linguistic and anthropological studies of the language and culture of Deaf people has begun to reach large numbers of people - both deaf and hearing. Gradually, some of these people have begun to change their view of ASL and Deaf people; behaviorally, these changes have been manifested as movement away from the role of the oppressor or the role of the "successfully oppressed". These studies have also enabled the publication of texts and videotapes designed to teach ASL as a second/foreign language (e.g. the five-text and videotape Baker and Cokely series 1980-81). Colleges and universities are beginning to employ these new materials to teach, for the first time, American Sign Language (e.g. Gallaudet College, summer of 1982). And a handful of Deaf people are struggling to resist the fiercely ingrained near-instinct to code-switch and, instead, intentionally and proudly use their language for public lectures, workshops, and classes.

3.0 Deaf community and Deaf culture

What follows is a brief survey of the relatively little information available on Deaf people's experience and values as members of the Deaf community.

Most deaf people have hearing parents; in fact, only three to four percent of all deaf children are born to two deaf parents (Trybus and Jensema 1978, Karchmer, Trybus and Pacquin 1978). Thus, most deaf children enter school relatively a-lingual and not having experienced the process of enculturation normal for most hearing children of hearing parents and deaf children of deaf parents.

Until recently (before the push of P.L. 94-142 toward mainstreaming), the majority of deaf children have attended special schools, most of them residential. There deaf children eat, study, sleep, and play together. For most of the students, this is their first exposure to the deaf community. It is the place where they make life-long friends (often the person they will later marry); it is often the place where they first experience sustained contact with deaf adults (who in the past have frequently had the role of dorm counselor or houseparent); it is the place where most learn and refine their ASL skills (Baker and Cokely 1980).

How do most deaf children learn ASL? By interacting with deaf children of deaf parents (who often become leaders in their peer group) and by interacting with the one or more deaf adults working at the residential school, if these are available (Meadow 1972, Markowicz and Woodward 1978).

Throughout their adult years, deaf people most frequently socialize with other deaf people, and at least 85-90% marry other deaf adults (Rainer et al. 1963, Schein and Delk 1974). Social activities often include deaf sports events (including regional tournaments and special olympics), parties with captioned films, special tours, and school reunions, as well as activities of a mainstay of the deaf community: deaf clubs (Baker and Cokely 1980). The National Association of the Deaf currently lists well over 175 different deaf clubs in the United States. These clubs serve a wide range of social, political, religious, and recreational functions, and, historically, have had a vital role in the lives of deaf people.

Membership in the ethnic, deaf community is primarily a function of attitude rather than audiology; that is, members are persons who identify themselves with the ethnic group (which means supporting its values) and are accepted as members by other members. This has^s been called "attitudinal deafness" (Padden and Markowicz 1976). The actual degree of hearing loss ("audiometric deafness") is relatively unimportant. Thus, some audiolgically deaf persons are not members of the ethnic group, and many audiolgically hard-of-hearing persons are members. The latter have frequently been observed to respond "Deaf" when asked "are you deaf or hard-of-hearing?" - a response which shows their identification with the ethnic group. As Carol Padden, a deaf linguist, observes:

"Deaf" is not a label of deafness as much as a label of identity with other Deaf people. A person learning to interact with other Deaf people will quickly learn that there is one name for all members of the cultural group, regardless of the degree of hearing loss: Deaf. In fact, the sign DEAF can be used in an ASL sentence to mean "my friends", which conveys the cultural meaning of "Deaf". Although Deaf people recognize and accept members that are audiologically hard-of-hearing, calling oneself "hard-of-hearing" rather than by the group name is interpreted by some Deaf people as "putting on airs", because it appears to draw undue attention to hearing loss. (1980: 100)

What are the values held by Deaf people? Padden, has ventured one of the first available descriptions (1980). On the subject of language, she writes:

Certainly an all-important value of the culture is respect for one of its major identifying features: American Sign Language...Because Sign Language uses the hands, there is a 'sacredness' attached to how the hands can be used to communicate. Hands are used for daily manual activities, gestures, and Sign Language, but not for other forms of communication that are not Sign Language. Deaf people believe firmly that hand gestures [signs] must convey some kind of visual meaning...there must be "reason and rhyme" behind a sign. (1980: 95-96)

Padden points out that this requirement that signs make visual sense explains Deaf people's strong resistance toward Cued Speech (a system employing hand cues to help differentiate speech sounds) - which she calls "nonsense" use of the hands. This requirement and, more significantly, the value placed on respect for ASL also help explain why Deaf people have generally responded quite negatively toward the "horrendous proliferation of [new] signs" (Schreiber 1974-75) and alteration of old signs that accompanied the advent of manual codes for English in the early 1970's.

On the subject of speech, Padden writes that speaking is not considered appropriate behavior for within-group interactions.

Mouthing and the use of speech represents many things to Deaf people. Since speech has traditionally been forced on Deaf people as a substitute for their language, it has come to represent confinement and denial of the most fundamental need of Deaf people: to communicate deeply and comfortably in their own language. Deaf people often distrust speech communication for this reason. In speaking, the Deaf person feels she will always be at a disadvantage and can never become fully equal to hearing people who, from the viewpoint of the Deaf person, are always the more accurate models of speaking. (1980: 97)

This negative view of speech for Deaf-Deaf interactions helps explain why Deaf persons who may use their voice while communicating in signs with unskilled hearing signers will automatically discontinue voicing when turning to communicate with another Deaf person in the conversation. Obviously, another factor is comfort: it's easier to communicate in signs without the restrictions and added burdens imposed by the need to speak English at the same time (Baker 1980a).

On the subject of social relations, Padden writes that social activities are highly valued by Deaf people as a way of maintaining contact with each other. Naturally, opportunities to communicate freely and comfortably are much appreciated. "Deaf people often remain in groups talking late, long after the party has ended, or after the restaurant has emptied of people" (1980: 97). This appreciation of opportunities to communicate was recently seen again in the words printed on a ticket for a 1983 New Year's Eve party given by a Deaf group. The ticket gave all the usual information about where, when, and cost. But at the bottom where it listed what party goers could expect to do, the ticket read "EATING, SURPRISES, DANCING, CHATTING" (Bienvenu, personal communication).

In describing the stories and literature of Deaf people, Padden offers the following as a typical "success story":

A deaf person grows up in an oral environment, never having met or talked with Deaf people. Later in life, this deaf person meets a Deaf person who brings him to parties, teaches him Sign Language and instructs him in the way of Deaf people's lives. This person becomes more and more involved, and leaves behind his past as he joins other Deaf people.
(1980:97-98)

Contrary to the values expressed by A.G. Bell and others in an earlier section of this chapter, Deaf people view the acquisition of ASL and integration into Deaf society as highly desirable: these are part of what it means to be a "successful Deaf person". As such, these goals of Deaf people point to a major conflict of values between the deaf community and the educational establishment which values only those skills assumed to help deaf people "make it" in the hearing world and ignores the values of the community it purports to serve.

Chapter II

NONMANUAL BEHAVIORS

1.0 Introduction to a visual-gestural language

American Sign Language is a visual-gestural language, a language expressed with movements of the body and received with the eyes. The primary context in which it is used is face-to-face interaction, where at least the top half of the bodies of the interactants is generally visible.

1.1 The power of eye gaze

Signed conversation differs uniquely from spoken conversation in that a speaker (signer) cannot successfully initiate a conversation or a 'speaking' turn until the desired addressee looks at the potential speaker -- i.e. an interactant cannot 'say' something (and be 'heard') if the other interactant is not looking.

As Baker (1977) observes, this single constraint makes eye gaze one of the most powerful regulators of signed conversations since it determines when an interactant can 'speak'. For example, speakers use -GAZE (not looking at the addressee) as a way of keeping their turn and +GAZE (looking at the addressee) as a way of signaling their willingness to give up their turn. An addressee's +GAZE (looking at the speaker) signals that the speaker may initiate or continue a turn. One of the ways for the addressee to 'claim a turn' (i.e. try to get the 'floor') is to switch to -GAZE and begin signing when the speaker returns to +GAZE to check on addressee decoding (op.cit.:218-219).

1.2 Locus of addressee gaze

Precisely where do addressees look when they are +GAZE? Siple's research on visual acuity, reported in 1973 and published in 1978, finds that addressees look at the speaker's face -- specifically, the eyes-to-mouth region. Thus, the speaker's face is the area of highest visual acuity for the addressee.

This fact is significant for an understanding of the phonology and syntax of ASL. For example, it helps explain why many more signs are made in head, face, and neck locations than in locations ranging from the shoulders to the waist (Battison 1978:42). It also helps explain why signs made in these lower regions tend to have unmarked handshapes (*ibid.*). In addition, this fact concerning visual acuity helps explain why two-handed signs made around the face have historically tended to become one-handed signs and why one-handed signs made around the waist have tended to become two-handed signs (Frishberg 1975). The redundancy provided by having two hands doing the same thing is more needed in areas of lesser visual acuity but less needed (and perhaps 'noise'-producing) in areas of greatest visual acuity.

Addressee gaze on the speaker's face also means that movements of the speaker's face are highly visible. As later sections of this chapter will describe, certain movements of the speaker's face serve major syntactic functions in ASL. In fact, several facial signals may occur at the same time (e.g. interrogation, negation, and a facial adverb). This type of complex signaling on the face is possible because the addressee's gaze makes the face the area of highest visual acuity.

1.3 Mutual gaze

Assuming that an addressee's +GAZE is constant (see Baker 1976b for exceptions), then periods of speaker +GAZE constitute periods of mutual gaze. Whereas periods of mutual gaze among hearing interactants in spoken conversations tend to be comparatively short (e.g. little more than a second for previously unacquainted interactants--Kendon 1967:28), periods of mutual gaze in signed conversations can be quite long. Baker (1977) reports that periods of mutual gaze extending longer than five seconds were not unusual for female interactants engaging in relatively noncompetitive turntaking.

However, since eye gaze is a powerful regulator of signed conversations, periods of mutual eye gaze are much shorter (and less frequent) during conversations characterized by competitive turn-taking. Baker's (1976b) analysis of one such stretch of competitive discourse between two males found the ratio of speaker $\pm$ GAZE to be approximately 50-50.

However, periods of speaker -GAZE are not simply a function of turn control or of a need for "advance planning" (Kendon 1967) - i.e. a need to concentrate on what to say next without being distracted by feedback from the addressee. These periods are also determined by rules of ASL which require speaker gaze at specific locations in space -- for example, for pronominal or deictic reference or when using a classifier. These requirements on speaker eye gaze will be described in later sections of this chapter.

1.4 Simultaneous signing

In signed conversations, speakers are more able to express and receive the language at the same time than are speakers in spoken conversations. That is, the modality of the language allows interactants to sign and observe another's signs without a loss of understanding (for how long?), whereas in spoken conversations, it is more difficult to hear another's speech while talking. For example, Jaffe and Feldstein (1970) report a mean duration of less than .5 second for periods of simultaneous speech in speaking dyads. However, Baker (1977) analyzed two dyads of deaf signers and found the periods of simultaneous signing to average 1.5 seconds in length, with the longest period lasting up to 4.3 seconds.

This difference becomes more meaningful when considered alongside two other findings: that the average length of an ASL sentence is 3.25 signs (Grosjean and Lane 1977), and that the rate of conversational signing ranges from 2.4-2.6 signs per second (females, long turns) to 3.0 (females) and 3.12 (males) signs per second in rapid turn-taking exchanges (Baker 1976a, Baker and Padden 1978). Thus, an average 1.5 second period of simultaneous signing would yield an average 1.2-1.44 sentences (using the lowest, 2.4, and highest, 3.12, signing rates). The longest period of simultaneous signing would then correspond to an approximate 3.17-4.13 sentences (using the same range).

However, as can be seen in the data transcripts in Appendix A this apparent, stunning simultaneity is not so simultaneous. In fact, during these stretches of simultaneous turns, the interactants' signs are frequently synchronized. That is, one is making

a sign during the other's between-signs pause, and so on resulting in a kind of synchronizing alternation of signs and pauses.

1.5 Distance between signers

Another simple but significant fact about signed conversations is that they entail movements of the signers' hands and arms in the space around their bodies. Thus, interactants must be located far enough away from each other to not inhibit these movements. For dyads, a comfortable distance while standing seems to be approximately six feet apart (Siple 1978).

1.6 Rest positions

In addition, since the natural, relaxed position of the hands and arms while standing is to have them hanging down at the sides of the body, any hand/arm movement upward and/or outward from this relaxed position can be viewed as a step toward increased muscular tension and a step toward the initiation of signing. Baker (1977) has identified three addressee "rest" positions which are meaningful in the turn-taking system of Deaf signers using ASL. (I have used these positions in the data transcripts shown in subsequent chapters.)

The "full-rest" position corresponds to the maximally relaxed state described above; it indicates that the addressee is attentive to the speaker and is not physically preparing to perform a sign. The "half-rest" position means the hand(s) are at the waist with the palm(s) facing the addressee's own body; it indicates attentiveness to the speaker but also a preparation to interrupt or an

anticipation that the speaker's turn will end soon and that the addressee will then respond. Interruption or turn initiation is often then signaled by a changing of palm orientation so that the palm is facing upward and slightly toward the current speaker (op.cit.:219). The "quarter-rest" position means the addressee is resting one hand (usually the dominant signing hand) against the body above the waist. This position is primarily seen during discourse involving a rapid exchange of turns since it maintains the dominant hand very close to the center of the signing space and, thus, requires the least amount of effort toward transfer into the speaker role (op.cit.:221). When one hand is at quarter-rest, the other is usually at half-rest.

2.0 Facial expression and emotion: popular beliefs

Before beginning to examine past studies of nonmanual behaviors, it is helpful to know the context in which such studies have occurred. Part of this context concerns popular beliefs among deaf and hearing people about the role of facial behavior during deaf people's signing.

Most of the myriad texts and manuals which have tried over the past century to describe "the language of signs" have made some comment about "facial expression". Most of these note that it is "important" and should be used "appropriately". Many claim that its appropriate use will make you a more "effective" or "interesting" communicator; on the other hand, if you don't use "enough", you risk the fate of being "boring". With few exceptions, the text writers agree that deaf people use "more facial

expression" than hearing people, that facial expression is a "non-verbal" aspect of signing, and that the function of facial expression is to show the signer's "emotions" (for a recent example, see Walker and Pearson 1979).

3.0 Linguistic research on nonmanual behaviors: an historical overview

Among the many surprisingly prophetic statements of William Stokoe in his seminal publication, Sign Language Structure, is the assertion that the facial activity of ASL signers "needs much more investigation, for it is the key to syntactical structure" (1960:63). Stokoe based his claim on the observation that a statement like 'I remember' and a question like 'Do you remember?' may be signed identically in terms of their manual components, but distinguished by their facial activity. During the question, "the signer looks directly at the person asked and slightly opens his face, that is, his eyebrows raise as his chin [meaning head] lowers" (1960:62). Stokoe also noted that headshaking functions syntactically and can negate a manual string in the absence of a (manual) negative sign (1960:65).

At that time and through 1972, Stokoe was describing ASL as being "dual channel" -- manual and facial -- where "facial" included movements of the eyes and head. In 1972, he noted the use of "facial" behaviors in pronominal and deictic reference, thereby demonstrating that such behaviors can not be considered solely as a close analogue of intonation features since certain facial behaviors are "analyzable into morphemes which [can] be listed in the lexicon like manual signs" (1972:113).

Bellugi and Fischer's 1972 paper corroborated Stokoe's findings and added their observations on the role of "facial expression" and "body attitude" in negative and positive tag-question formation and in direct quotation (also called direct address). A year later, while presenting a first discussion of topicalization in ASL, Fischer (1973) noted that the "slight pause" used to signal the break between the topicalized constituent and the rest of the sentence is "often accompanied by a change in facial expression such as a widening or narrowing of the eyes, a shift in the direction of gaze and/or a change in the shape of the lips" (1973:18). She called this pause and change in the signer's face an "intonation break" (ibid.).

In a paper on historical changes in ASL signs, published in 1975, Frishberg described how manual signs which previously required concomitant facial expressions or other body movements had changed to involving movements of the hands alone. She characterized this apparent tendency to concentrate all lexical information onto the hands as "part of the whole transition away from iconic, pantomimic gestures -- toward arbitrary, true signs" (1975:711). Woodward and Erting (1975) corroborated Frishberg's hypothesis of this tendency, but also found some exceptions which showed no movement toward change -- signs which are made solely by facial movements.

In 1975, two researchers, Baker and Liddell, began to devote their primary attention to understanding the diverse role of non-manual behaviors in ASL. Whereas Baker sought to develop a general taxonomy of these behaviors, increasingly arguing for

research strategies which would properly attend to their potential significance, Liddell focused on understanding their role in subordination and the determination of sign order. (Their specific findings are examined in the next section.)

Baker's 1976 papers described how "configurations" of non-manual behaviors, rather than a single behavior, served various linguistic functions in ASL. She argued that since the makings for such configurations of nonmanual activity are continually available (because the body parts are normally present and visible), the language itself tends toward continuous, multi-channel activity. Thus, her coding of ASL sentences distinguished five "channels" of potentially linguistic behavior (i.e. the eyes, face, head, hands and arms, and body posture), divided on the basis of what body parts can move independently and intuitions concerning what might prove to be linguistically significant (1976a, and Padden 1978).

Baker's coding (from repeated viewings of videotapes in slow motion and real time) gradually moved from the use of often lengthy, English descriptions of what was happening in each channel to more efficient and phonetic transcription conventions, including the Facial Action Coding System of Ekman and Friesen (1978a).

Liddell was able to 'see' and analyze patterns of non-manual activity by working with proof sheets from 35mm negatives of video recordings. 'Freezing' the nonmanual behaviors on the proof sheets, which also showed the co-occurring manual signs, enabled him to detect changes in facial behavior or head position in

different linguistic contexts. This technique then provided strong pictorial evidence of the linguistic role of a wide variety of nonmanual behaviors in ASL (1977/80).

By 1980, evidence had been accumulated that behaviors of a signer's eyes, face, head, and torso serve as linguistic signals marking yes-no questions, wh questions, rhetorical questions, conditionals, relative clauses, topics, direct address, pronominal and deictic reference, and negation. They had also been considered a fruitful source of information for determining syntactic boundaries (see discussion in section 8.0).

3.1 Summary

Thus, research on the nonmanual aspects of ASL began with Stokoe's 1960 prophetic intuitions and initial observations, progressed through a series of piecemeal discoveries and corroborations of those intuitions, and now has reached a stage where American Sign Language can no longer be called a "visual-manual" language, as many researchers have done heretofore. More importantly, it is now very clear that 'felicitous' study of ASL and of other signed languages (see sections 5.2.1 and 5.2.2) requires a description of more than the hands and arms.

The next section will examine each of the above findings in more detail, examining the lexical versus syntactic roles of nonmanual behaviors and the specific behaviors which occur in each context.

4.0 Linguistic research on nonmanual behavior: a personal comment

I have often had the impression that linguists' formal descriptions of American Sign Language (including my own) have been somewhat comical — like frenzied attempts to jam a huge mass of gooey dough into a container that's too small. Even when several of us add our hands to the pushing effort, there's always sticky blobs spilling over the sides that we can't force inside.

We tried to describe ASL as built upon a layer of "meaningless" units which then made possible the duality of patterning that Hockett (1963) said was crucial for Language. But the meaningfulness of many of those minimal units spilled across the pages of our analyses (see Supalla 1982 for a recent example). Similarly we boldly claimed that "most signs are not iconic" (e.g. Fisher 1974:11) in order to comply with (our understanding of) Saussure's description of the relationship between linguistic symbols and their referents. But the intrinsic and pervasive iconicity of ASL signs fought back against such a forced fit (e.g. Klima and Bellugi 1979:34, Supalla 1980:29).

I think another example of this kind of felt need to distort reality so it will fit our container centers around the notion of the "minimal pair" — a key tool of Bloomfieldian linguistics. The minimal pair consists of two linguistic units which are identical except for one minimal feature which distinguishes them — like the minimal pair 'pat' [paet] and 'pad' [paed]. This tool is used to find the distinctive features of a language. Psychologists do the same kind of thing when they design experiments which attempt to control all variables except one. They then test to see if that variable is distinctive.

The problem with this kind of thinking is that: (1) it encourages one to assume that all phenomena are constructed in such a way that they, by proper analysis, can be reduced to a set of minimal, simple features; (2) it assumes these features then can explain the appearance and actual workings of the phenomenon; and (3) it then assigns the greatest value to these "simples", assuming these are the "really important" primes -- and as a corollary, calling the rest, the leftover behaviors, "redundant" or unrelated.¹

This kind of reductionistic thinking would then cause the linguist confronted with the results of more recent phonetic experiments to say "Ah, so the real feature distinguishing 'pat' and 'pad' is not vocal cord vibration but is vowel lengthening".

But this kind of thinking cannot co-exist with modern characterizations of human systems as continuously mutually interrelating and mutually influencing. With all the attention of the 1960's and 70's on (big 'C') Context, with the changing characterization of communication systems from one-way signaling of sender to receiver to "interactants" which continuously monitor and respond to each other, with the righteous cries of the rising pragmatics school and finally, with our determined focus on how people "really

¹ Another major argument against this kind of analysis is that it usually requires highly controlled, and hence highly unrealistic, procedures. Often the psychologist, for example, assumes that the result of an experiment reveals what happens in real life -- in my opinion, a grave error of interpretation. The result simply describes how the subject responded in that experiment; it's quite a leap of faith to assume any more than that, especially when "real life" is vastly different from the controlled environment of the experiment.

language" -- still it may be that our tools and their underlying values are undermining our best efforts.

How does this harangue relate to research on signers' non-manual activity? It relates to the demand I have felt to find data that can be subjected to minimal pair analysis. As such, it relates to a tendency to overlook other co-occurring behaviors in order to "find" the distinctive feature. The minimal pair analysis was the way to prove that certain behaviors of the signer's eyes, face, head, and body were indeed linguistic (and, hence, worthy of linguists' attention!).

But the language just wouldn't cooperate. Every time I thought I had discovered a minimal pair, for example, two signs with identical manual components but distinctive facial components, I saw (or suspected) that the hands were slightly different. For example, observe, in the illustrations on the next page, the clear differences in the manual signs with and without the nonmanual adverb 'cs', which means 'close in time or space'.



ARRIVE-AT-here
'arrived'



CS
ARRIVE-AT-here
'just arrived'



NOW
'now'



CS
NOW
'right now'

In the same way, notice the different relative heights of the hands in the two photos on the next page. Here the signer is making the sign PAPER with the topic ('t') signal and the sign PAPER with the signal marking it as a yes-no interrogative ('q').



t
PAPER



g
PAPER

Of course, if you ask a signer to sign [NOW + 'cs'] without raising the sign and/or repeating the movement, the signer can do it -- but it "feels strange" and s/he would never sign it that way spontaneously. But does the fact that s/he can do it make the manual difference "unimportant" or "redundant"? And if you sign [NOW + 'cs'] without the raised position and repetition, the informant will understand you -- but it "looks strange" (and probably "hearing"!). It's force-fitting the mass into the container.

Unfortunately, sometimes deaf informants have helped us in the force-fitting. As Schreiber, in the passage quoted in Chapter I, acknowledged, deaf people are often good at telling you what you want to hear; the pressures to do so have been great. (This raises broader questions about the pitfalls of elicitation techniques in a linguistically and culturally oppressed community -- some of which are addressed in section 8.0 and in IV 3.2.)

So where does this leave us? For me, speaking generally, it means focusing on providing more accurate, detailed descriptions

of what is happening when people are signing in American Sign Language; it means maintaining a hopefully respectful skepticism of the "results" of formal elicitation sessions and the traditional labels and value judgments applied to those results; and it means a readiness to grapple with the whole -- the fluid and dynamic configuration of behaviors present at any moment which, together, mean something.

With those lofty aims in mind, let's examine what has been "found" in the studies on nonmanual behaviors in ASL.

5.0 Findings: lexicon

Most of the nonmanual behaviors observed and/or analyzed to date have been described as serving syntactic functions. Very few have been viewed as part of the lexicon of ASL, either as components of signs or as signs in themselves.

5.1 Historical change: lexical role

As described in section 3.0, an historical tendency to concentrate lexical information on the hands has been hypothesized by Frishberg (1975) and supported by Woodward and Erting (1975). Frishberg presents three examples, glossed as (BE)-PATIENT, COMPARE, and THINKING, which, in Old French Sign Language (OFSL) and/or the ASL signs described by J. Schuyler Long in 1918, required movements of the signer's eyes, face, and/or head but no longer do so. For example, the OFSL sign THINKING had an index finger touching the forehead while the head moved in a circular motion. However, today the head does not move, and

the index finger moves in a small circle near the forehead (1975:711). Woodward and Erting provide five similar examples from Georgia. The signs PRETEND, used by White signers, formerly had no manual component, then had both a facial and manual component (the form found among some signers 40-50 years old), and finally dropped the facial component completely (the form found among younger signers now). Four signs used by Black signers in Georgia (DECEMBER/SANTA CLAUS, COP, HOSPITAL, and NURSE) required facial behaviors but no longer do so.

5.2 Synchronic evidence: lexical role

However, present-day synchronic evidence of the nonmanual components of signs across several signed languages, including ASL, suggests that the modality of Sign allows for some flexibility in the assignment of role for nonmanual behaviors. Thus, the historical tendency, hypothesized for ASL, to move lexical information off the face and head is certainly not rigid.

5.2.1 As components of signs

Concerning this lexical role, Baker (1976a), for example, notes that the signs LATE and NOT-YET and the signs WRONG and UNEXPECTEDLY seem to be minimal pairs in ASL, minimally distinguished by the movements of the signer's face and head concomitant with the second sign in each pair. The same claim is made by Bellugi and Fischer (1972) for the signs FURNITURE and IT'S-NOTHING. (I would add that the one-handed form of these signs with the non-manual adverb written as 'mm' gives the meaning 'about nine o'clock'.)

Similarly, Woodward and DeSantis (in preparation) report a variety of minimal pairs in Providence Island Sign Language, such as WOMAN and MOTHER, MAN and FATHER, and the signs SMALL-PIG, DOG, and CAT which differ only in their accompanying mouth movements. Frishberg (personal communication) has also noted the minimal pair UPSTAIRS and GOD/HEAVEN in Puerto Rican Sign Language. Elena Radutsky (personal communication) reports that she, too, is finding sets of such minimal pairs in Roman Sign Language.

Some other researchers have not presented their evidence in the form of minimal pairs, but have claimed that certain signs do have facial components. This is seen in Vogt-Svendsen's (1981, 1983) descriptions of "mouth movements" in Norwegian Sign Language, Lawson's (1983) paper on "multi-channel signs" in British Sign Language, Smith's (1977) exploration of "mouth and lip movements" in Taiwan Sign Language, and Wikstrom and Bergman's research on lip movements in Swedish Sign Language (personal communication).

5.2.2 As signs themselves

Baker (1976a) claims that there are signs in ASL that do not have manual components, that is, signs which are made solely by movements of the face and head. She notes that these signs tend to be of two types: those which refer to more private behaviors, such as MENSTRUAL-PERIOD and DO-YA-WANNA-MAKE-LOVE (described by Woodward and Erting (1975) as a sign used by male white signers in Georgia; given a slightly different gloss here),

and those which normally occur as an addressee back-channel, or 'listener', response, such as YEAH-I-KNOW-THAT (or UH-HUH), OH-WHY-NOT?, OH-DEFINITELY-YES!, THAT'S-REALLY-INTERESTING, and NOT-YET. Thus, these "signs" seem to occur only in certain contexts.

A few unpublished examples from other signed languages suggest that this phenomenon of nonmanual signs is not limited to ASL. For example, Woodward has told me that the sign TO-LIKE-SOMETHING in Providence Island Sign Language is made by raising the brows, pursing the lips, and sucking in air. Similarly, Wikström has said that the sign DON'T-KNOW in Swedish Sign Language is made by puffing out the right cheek and then letting the air 'pop' out.

5.2.3 Sign or emblem?

It is interesting to note that what we have called "signs" here would be called "emblems" if we used the kind of analysis and definitions that Ekman and Friesen (1969) apply to the communicative behavior of hearing speakers. Ekman (1976) defines emblems as "acts which have a direct verbal translation usually consisting of a word or two, or a phrase" whose "precise meaning is known by most or all members of a group, class, subculture, or culture" (1976:14). He also notes that such acts are used deliberately (with or without speech) to send specific messages and are received as such by the person(s) who sees it. Two examples of American emblems are the "OK" emblem (thumb and index finger contact, other fingers upright) and "the finger" emblem (fist with middle finger extended).

In considering the question of whether emblems are linguistic, Ekman responds that, unlike words, emblems "are usually not employed during conversation in strings, but [occur] singly" (op.cit.:22). When rarely they do occur in strings, it is because the vocal conversation is in some way constrained. Some emblems frequently occur as "listener responses" (22), similar to Baker's second category of "facial signs".

As so described, it seems to me that there is no functional difference between emblems and words; however, there is a behavioral difference--emblems rarely occur in strings whereas words do--and a structural difference--most emblems are visual-gestural (though some are intonational, as in the "voice emblems" described by Scherer, 1975) whereas words are composed of sound phonemes.

One could argue, then, that we should use the term "emblem" instead of "sign" to separate out these behaviors in signed languages which seem to parallel the phenomena called "emblems" in the discourse of hearing speakers. However, for the moment, it seems wiser to withhold judgment until we know more about the workings of the face, etc., in signed languages. The fact that non-manual behaviors play a major role in the syntax of at least one signed language, ASL (and apparently in others), distinguishes them significantly from the role of so-called "non-verbal" behaviors (which has traditionally included emblems)¹ in spoken conversations. The fact that behaviors of a signer's face and head

¹However, such a simple assignment of all body movements (during spoken conversations) to the category "non-verbal" is, in the view of many scholars, also unsatisfactory (e.g. Koneya 1981).

are components of some signs also muddies of the waters--and affirms the need for caution before asserting parallels with behaviors in spoken discourse.

5.3 Morphemic status

5.3.1 Some examples

One interesting question to consider in the study of signer's eyes, face, head, and torso movements is whether the non-manual components of signs are morphemic and have consistent meanings in different contexts (like the English prefix '-un' in 'uneasy', 'uneducated', and 'unsuited'). Or are they meaningless when separated from the rest of the sign (like 'st' in the English words 'street', 'stop', and 'stupid')? One can ask this question of the whole configuration of eyes-face-head movements that may occur with a sign, or of all of the behaviors which may occur within a given channel--e.g. the facial behaviors, or of each individual behavior within each channel--e.g. brow raise, nose wrinkle, lip corners pulled down.

For example, Baker (1976a) reports that the sign NOT-YET (minimally paired with LATE) has both a headshake and slight tongue protrusion (except when it occurs within a grammatical clause, where it may lose the tongue protrusion). However, the headshake and tongue protrusion alone can also communicate the meaning 'not yet' (see section 5.2.2); so we know that at least together, they are morphemic. But as we will find out later in

the discussion of negation, the headshake alone is a morpheme of negation. So what about the tongue protrusion? Does it carry a consistent meaning?



NOT-YET

To my knowledge, there are only two discussions of meaningful uses of the tongue in the ASL literature. One is a recent paper by Shawna Davies (1983) on lateral and vertical "tongue flapping" (LTF and VTF), which she relates to two morphological categories: (a) intense enthusiasm, excitement, and (b) extensive time or distance. Both the LTF and VTF involve rapid movements of the tongue, unlike the simple protrusion of the tongue in NOT-YET.

The other mention of meaningful uses of the tongue in ASL is in Scott Liddell's (1977/80) description of 'th'—a "nonmanual adverb whose semantic contribution centers around lack of control, inattention, unintention, and unawareness" (1977:77). He says the components of this adverb are: head tilted, tongue protruded through lips (AU 19), lips pushed out (AU 18), and upperlip

slightly curled upward (AU T22).¹ This adverb is seen in the two illustrations below taken from Baker and Cokely (1980:19). Notice, however, that the lip curling (AU 22) described by Liddell is not present in either informant. Secondly, the male's version of 'th' also does not exhibit the pushing out of the lips (AU 18). In addition, both informants show a drooping of the eyelids (AU 41), not mentioned by Liddell.



th
WRITE
'write carelessly'



th
DRIVE
'drive inattentively'

Thus, the apparent areas of consensus between Liddell's description and illustration (1977:78) and the illustrations in Baker and Cokely (1980:19) are the tongue protrusion and the head tilt (which both show to be 'back' and 'to one side'). Assuming both authors have presented accurate illustrations of the actual behaviors of their informants, we then must attribute the found

¹I have added the AU classifications, which are based on both Liddell's descriptions and his accompanying photographs.

differences between them either to some type of variation within their informants or to differences in the contexts (semantic/syntactic) in which the behaviors were elicited.

Now led to assume that the morpheme which means something like 'unaware' or 'out of control' has the basic form [tongue protrusion + lateral and back head tilt], let's examine one last piece of information. In the free conversation data transcripts presented in Appendix A, there are several instances of tongue protrusion, or what Ekman and Friesen (1978a) call "tongue show" (AU 19). These instances can be categorized as either: (a) related to lip-licking, (b) related to the mouthing of fingerspelled words (like 'Theisman' or Riverdale'), or (c) adding to the meaning of an utterance.

Two examples of category (c) are found in the data transcripts. In one, a male is describing the inappropriate behavior of another man who didn't focus on the task at hand but instead 'drank a lot and was really out of it'. The meaning written here in single quotes was communicated with the sign DRINK-ALCOHOL"regularly" and a protrusion of the tongue (largely co-terminous with the verb). The signer also turned his head to the right and left repeatedly in rhythm with the alternating movements of his hands, bringing one hand to his mouth, then the other, and so on. This movement of the signer's head with the sign seems to be related to the modulation for temporal aspect (glossed as "regularly") rather than the tongue protrusion and its meaning, in context, 'really out of it'. Thus, in this instance, the tongue protrusion seems to carry the adverbial meaning in the

absence of the predicted head tilt. In the other example, there is no head movement and the tongue protrusion also carries the meaning 'out of it' or 'unaware'.

Returning to the reason for this somewhat diversionary discussion of tongue protrusion, can the protrusion of the tongue in the non-manual sign NOT-YET be analyzed as a separate morpheme? (Recall that the concomitant headshake can be analyzed as a morpheme of negation.) On the basis of the evidence we have so far, we could only make such a claim if the sign included in some way a meaning like that described by Liddell for 'th'—i.e. lacking control, unaware, inattentive, unintended. And it is not unreasonable to posit such a semantic relationship. Intrinsic to the meaning of the sign NOT-YET is the idea of 'incompletion', that something has not occurred which the subject still intends to do. Using the words in our definition of 'th', the subject has not 'taken control' and 'attended to' the completion of the task.

If one accepts this analysis, then in the case of NOT-YET, each of the (two) nonmanual components of the sign constitute (or derive from) a separate morpheme. Continuing with this kind of analysis, what about the nonmanual components of UNEXPECTEDLY—which Baker (1976a) minimally pairs with WRONG and which Bellugi (1980) claims to be an "idiomatic derivative" of the sign WRONG? The sign UNEXPECTEDLY characteristically includes a brow raise (AUs 1+2), widening of the eyes (AU 5), and mouth-opening jaw drop (AU 26).

Are each of the facial components of the sign separate morphemes? I would argue they are not, but that the total con-

figuration conveys the meaning 'surprise'. This argument is based on the fact that (a) this configuration (AUs 1+2+5+26) has been identified by Ekman and Friesen (1975, 1978c) as the prototypical and universal facial expression of 'surprise', and (b) the expression of surprise is semantically congruent with the meaning of the sign UNEXPECTEDLY. (The issue of linguistic versus emotion expressive uses of the face is discussed later in Chapter V.)

If one accepts this quick analysis, then we have reached the conclusion that some of the nonmanual behaviors which occur as components of signs (that also have manual components) can be analyzed as separate morphemes (as seen in the case of the headshake and tongue protrusion in NOT-YET), but that other behaviors combine together to form morphemes (as in the case of the brow raise, upper eyelid raise, and jaw drop in UNEXPECTEDLY). I am not aware of any examples in which the nonmanual components/concomitants of a sign (either a configuration or as separate behaviors) can not be analyzed as morphemically separate from the manual segments.

5.3.2 Treatment in the ASL literature

All of the studies of nonmanual behaviors in ASL (with the exception of Coulter's 1979 dissertation) have basically treated such behaviors as configurations. That is, these studies (a) identified the specific behaviors of the eyes, face, head, and/or torso which occur together in a particular (usually syntactic) context, and then (b) tried to show that the configuration of behaviors serve a linguistic function. For example, Liddell (1977/80)

identifies three co-occurring behaviors (head tilt backwards, raised eyebrows, and raised upper lip) as a configuration which make a string of signs a relative clause.

The one exception to this approach is Coulter (1979) who argues that behaviors like "spread lips", "nose wrinkle", "raised upper lip", and "raised brow" are, each, separate morphemes. There are many problems with Coulter's analysis—not the least of which is the skimpy or non-existent data support for his claims—but his view of nonmanual (actually facial) behaviors as analytically separable certainly deserves serious attention. It was with this in mind that I have raised the question of morphemic status early in our discussion of research findings on the lexical and, primarily, syntactic roles of nonmanual behaviors. We will return to this question after an examination of the behaviors which serve syntactic functions.

5.4 Modifier role

Baker (1979) reports having observed more than 20 phonetically different, recurring facial behaviors during elicitations of approximately 100 signs with five informants (native, Deaf signers). Her analysis found that these behaviors were not actually components of the signs, but that they functioned as modifiers of the signs (which were generally verbs, adverbs and adjectives). Interestingly, whereas the elicitation signs (e.g. SUCCEED, TAKE-OFF, TEND-TO, HORDES-OF, THIN, FAR-OUT, FEEBLE-MINDED, DISTANT-FUTURE, ELABORATE, EXPERT, STRUGGLE)

could be made without one of these facial behaviors, they usually occurred with one of them—even when the investigator was simply asking for the citation form of the signs. Often, the informants agreed in their association of a particular facial behavior with a particular sign. For example, all of them produced the 'th' adverb with the signs CARELESS, FEEBLE-MINDED, and AWKWARD. However, variation among the informants was also observed, and sometimes a single informant would exhibit two different facial behaviors during separate productions of a sign.

Baker concludes that this tendency to produce, concomitant with manual lexical items, semantically related (or coherent) facial behaviors is one more piece of evidence leading us to view ASL as a multi-channel language whose parts tend to continuously agree with each other and work together to form the message.

5.4.1 'mm', 'cs', 'th'

Three of these approximately 20 behaviors (those glossed as 'mm', 'cs', and 'th') are analyzed by Liddell (1977/80) as non-manual adverbs. Two of the adverbs, 'cs' and 'th', were illustrated in sections 4.0 and 5.3. The adverb 'mm', which basically means 'normal and proper', is illustrated on the next page.



mm
DRIVE

'drive along regularly'



mm
WRITE

'write at a regular pace'

Liddell reports that the significant part of the signal is the "configuration of the lips", although a tilt of the head back and to one side usually co-occurs with the lip movement (1977:66). This lip configuration is, in fact, a result of raising the chin boss (AU 17) and pushing out and slightly curling the lips without puckering them (AU 18+22).

All three of the "nonmanual adverbs" are found to be coterminous with the "lexical" adverb or verb with which they occur and to fall syntactically within the scope of interrogation and negation (Liddell 1977:65-82). For example, signing (YOU) SIT with the 'mm' adverb and yes-no question signal ('q') yields the meaning 'you just sat down like usual?' (in the context of describing a secretary's response to an irate boss).

I have also seen these nonmanual adverbs, especially 'mm' and 'th', occur as addressee back-channel responses in the absence of any manual lexical item. For example, when the

speaker in a casual conversation described a frustrating experience she had just had trying to register for a graduate class, the addressee responded with headnodding and (concomitantly) the 'mm' adverb—meaning 'Yeah, that's normal'. (The addressee also tightened and dimpled the corners of her mouth (AU 14), seemingly as an expression of combined regret and annoyance.) Similarly, when a girl was describing the unusual awkwardness of some boy, the addressee (also a girl) responded first with repeated, unilateral nose wrinkling (a "sign" which means 'Yeah, I know that') and then the 'th' adverb—which seemed to mean 'he's really out of it'. (During the whole sequence, the addressee was smiling.)

5.4.2 'puffed cheeks', 'pursed lips', 'intense'

Other nonmanual modifiers described by Baker (1976a) and Baker and Cokely (1980) include those written as 'puffed cheeks', 'pursed lips', and 'intense'. Both the 'puffed cheeks' and 'intense' modifiers add the meaning '+MAGNITUDE' and can refer to size, number, distance, intensity, frequency, or duration. However, the 'puffed cheeks' signal occurs much more frequently than the 'intense' signal. The latter seems to include the message that the magnitude is much greater than expected and, for some signers, too large, too far, too many, etc. (Baker and Cokely 1980:20). These two modifiers are contrasted in the following illustrations.



puff.cheeks
HORDES-OF

'a very large mass of'



puff.cheeks
HORDES-OF

'a very large mass of'



intense
HORDES-OF

'awfully huge mass of'



intense
HORDES-OF

'awfully huge mass of'

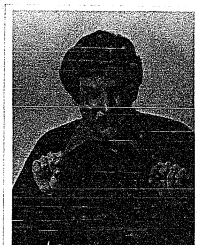
The 'puffed cheeks' signal most frequently occurs with verbs, especially when the verb is inflected for number or temporal aspect. However, it can also occur with nouns like TREE, PEOPLE, and PURPLE 5:—CL 'bruise'—meaning, respectively, 'large tree', 'many people', and 'big bruise'—and with signs like AWFUL ('really awful'), "WOW" ('that's really something') and YES ('yes, and I really mean it'—usually accompanied by nodding).

Many of the nonmanual modifiers can themselves be modified to indicate varying degrees of intensity. That is, since the facial muscles can be contracted (or relaxed) at different intensities (e.g. compare the 'pull' of the lip corners in a slight smile versus a wide smile), they can indicate varying degrees of meaning. For example, notice the facial differences between the female and male illustrations of the 'puffed cheeks' signal on the previous page. In the male's face, the brow squint (AU 4), cheek puff (AU 34), and chin boss raise (AU 17) are more intense than those behaviors in the female's face. Thus, when asked to compare these two illustrations, informants respond that the group described by the male is larger than that described by the female.

This variation in intensity within a nonmanual signal is also seen in the two illustrations below. Here the 'pursed lips' signal accompanies a descriptive classifier (also called a size-and-shape-specifier) for things which are thin, like a wire.



'very thin wire'



'very thin wire'

In the photo on the right, notice that the lip corners have moved more toward each other (AU 18); the brow squint is more intense (AU 4); there is tension in the cheeks and deepening of the infra-orbital furrow; the head is tilted downward; and the shoulders are 'hunched'.

Three sets of meanings have been ascribed to the configuration called 'pursed lips': (a) very small; thin; narrow, (b) smooth; bare, and (c) quickly; easily (Baker and Cokely 1980:21). For example, this modifier would be used to focus on the fact that a girl is 'small', a surface is 'smooth', or that a person 'breezed through' his work.

For our purposes here, it is interesting to note that the configuration called 'pursed lips' may, in fact, be two separate signals or a signal with two 'phonetically' different realizations determined by its semantic context. These possibilities are suggested by a close examination of apparent differences in certain facial behaviors when the signal occurs in different contexts. For example, examine the following photos.



pursed lips
(2h)F_t-CL
'very thin wire'



pursed lips
(2h)B-CL
'smooth floor'



pursed lips
FAST
'very fast'

The facial configuration in 'very thin wire' looks much like that of the male shown earlier, especially noting the eye squint and flattened, closely drawn together lips. However, the lower two photos of the female show a more rounded appearance of the lips and a relaxed lowering of the upper eyelid instead of the

tense squinting.¹ These differences obviously call for more study of different signers' facial displays in such contexts, but they also hint at the degree of 'fine tuning' that we may eventually discover through more of this careful analysis. And such a finding would be wholly congruent with the recent findings of similar 'fine tuning' in the manual production of signs in different environments (Klima and Bellugi 1979).

5.4.3 Co-occurrence of modifiers

As we shall see in Section 7.0, it is not unusual for non-manual grammatical signals to co-occur (e.g. the signals for negation and interrogation) or for a nonmanual grammatical signal and a nonmanual modifier to co-occur (e.g. the 'cs' adverb and the topic marker). However, with one exception, it seems to be physically impossible for nonmanual modifiers (which are primarily facial) to co-occur. All of the approximately 20 facial behaviors observed by Baker (1979) primarily involve actions of what Ekman and Friesen (1978a) define as the "lower face" (below the lower eyelid). In fact, all but the 'puffed cheek' modifier primarily involve movements of the mouth. These movements physically inhibit co-occurrence of one modifier with another (e.g. try 'pursed lips' with 'th').

The one exception is 'mm' and 'puffed cheeks'—both of which require keeping the mouth closed. These modifiers are semantically congruous in contexts where 'magnitude' is the norm or

¹The face in 'very fast' also has a slight brow raise—which I think is not a part of this particular modifier.

is enjoyed. For example, these two modifiers might occur with the verb *me-READ-book* (which would be inflected for number) to express the meaning 'read many books as a normal matter of course'. Or, the 'puffed cheeks' and 'mm' signals could co-occur with the inflected verb *me-GO-TO-restaurant*"regularly" to indicate that the action happens 'a lot' and is a 'regular' or 'normal' event. This example also illustrates the way such modifiers frequently agree in meaning with the inflections of verbs and predicate adjectives for temporal aspect (Baker and Cokely 1980).

6.0 Findings: referential uses

6.1 Pronominal/deictic reference

A signer's eye gaze direction and, to a lesser extent, head movements have been found to play a significant role when setting up referents in space and when making pronominal/deictic reference to such spatial locations (Bellugi and Fischer 1972, Lacy 1974, Fischer 1975, Friedman 1975, Baker 1976a, Baker and Cokely 1980). "Setting up referents in space" refers to the common process by which signers in a rule-governed manner, associate a nominal argument (person, place, thing, or idea) with a specific location in the space around their bodies. That location then represents that argument and reference to the location is functionally equivalent to pronominal/deictic reference.

There are a variety of ways to establish referents in space, almost all of them requiring directing the signer's eye gaze (which usually involves a turning of the head) to the spatial location. In

the case of body-anchored signs (signs which cannot be made in a spatial location because they involve contact with or closeness to the body) like BOY and WOMAN, this gaze direction alone, may serve to establish the referent in space (Baker and Cokely 1980:232). Eye gaze also frequently 'forewarns' the addressee that something will be established in the location indicated with the signer's gaze. That is, the signer's gaze to the location is often in advance of any manual marking of the location.

Once a referent has been established in a spatial location, pronominal/deictic reference is normally made by 'pointing' to the location with one of several possible handshapes. In a majority of cases, the signer will also gaze at this location as s/he points to it—which makes the reference visually salient and distinct from other signing movements. In certain contexts, this reference may be accomplished simply with eye gaze, usually accompanied by a headnod toward the location (Baker 1976a&b).

6.2 Direct address

A process which Bellugi and Fischer (1972) identify as much more common in ASL in comparison to English is that of "direct quotation" or "direct address". Through this device, the signer, in effect, 'becomes' one or more of the characters in a narrative and speaks or acts as that character. This "role playing" (Friedman 1976) is accomplished via eye gaze and body shifting 'into' the location which represents that character. When 'in' that location and looking 'from' that location, the signer also facially

takes on other affective or characteristic traits of the character (Baker and Cokely 1980). Thus, the body and gaze shifting has the effect of putting what is said "in quotes", indicating what was said and who said it.

7.0 Findings: grammatical signals

As mentioned previously, nonmanual behaviors appear to play a heavier role in the area of syntax than they do in the lexicon. In fact, sentence types in ASL are largely differentiated via conventional, rule-governed configurations of these behaviors (Baker 1980b). This next section will focus on describing those configurations and their function as grammatical signals.

7.1 Yes-No questions

The nonmanual marker of yes-no questions has been described in varying detail by Stokoe (1960, et al. 1965), Bellugi and Fischer (1972), Friedman and Battison (1973), Baker (1976a, and Cokely 1980), and Liddell (1977/80). The components of this signal (written as 'q') have been described as: a brow raise, 'widened eyes', forward tilting of the head and/or torso, and eye gaze directed at the addressee--as shown in the following illustration.



q
YOU

When displayed with a sequence of signs, the 'q' configuration signals that the sequence is a yes-no question. Sometimes the final sign in the sequence is held longer, often by repeating some aspect of the sign's movement or by wiggling the fingers while 'holding' the sign in place. Sometimes the second person pronoun (YOU) is copied at the end of the utterance and held while waiting for (and sometimes during) the addressee's response. The question may also, in certain contexts, be marked lexically at its beginning or end with one of several signs (glossed in Baker and Cokely 1980 as QM, QMwg, and me-ASK-TO-you). However, none of the manual behaviors are sufficient to mark an utterance as a yes-no question, in the absence of the 'q' signal.

The following example illustrates how the nonmanual signal 'q' makes a signed sequence become a yes-no question.

(1) FATHER BECOME-ANGRY^q
'Did Dad get angry?'

(2) FATHER BECOME-ANGRY^{nodding}
'Yes, Dad got angry.'

7.2 Wh questions

The nonmanual marker of 'wh' questions has been described by Baker (1980b) and Baker and Cokely (1980) as comprising a brow squint, head tilt (direction unspecified), torso shift forward (toward the addressee), and eye gaze directed at the addressee--as shown in the following illustrations. (The signal is written as 'wh-q'.)



wh-g
WHERE



wh-g
WHO

The manual sequence in a wh question usually includes a wh-word sign (e.g. WHERE, WHO, WHY, FOR-FOR, HOW, HOW-MANY, WHAT'S-UP). This sign generally occurs at the end of the sequence, although it may occur sentence-initially or at both locations, as illustrated in examples (3) and (4).

- (3) NAME YOUR (2h)"WHAT" ^{wh-g}
'What's your name?'
- (4) HOW FROM-rt-COME-TO-here ^{wh-g} HOWwg
'How did you get here?'

Like yes-no questions, wh questions may also be marked lexically as questions with the signs QM, QMwg, or me-ASK-TO-you; the final sign in the sequence may be held longer than usual; and the pronoun YOU may appear at the end of the sequence. The available literature implies that both the 'wh-q' signal and the inclusion of a wh-word sign are necessary for the proper formation of a wh question (but see V.3.3).

7.3 Rhetorical questions

The nonmanual marker of rhetorical questions has been described by Baker (1980b) and Baker and Cokely (1980) as comprised of a brow raise, head tilt (direction unspecified), and eye gaze directed at the addressee—as shown in the following illustrations. (The signal is written as 'rhet.q'.)



rhet.q
HOW



rhet.q
WHO

The available literature suggests that rhetorical questions appear relatively frequently in signed conversations and that they generally are formed with a wh-word sign or phrase, as illustrated in examples (5)-(7). (The sign REASON frequently appears in rhetorical questions and conveys a meaning similar to the meaning of the sign WHY.)

- (5) puff.cheeks rhet.g
 AWFUL*, WOMAN DIE WHYwg, REFUSE EAT
 'It's awful! Why did that woman die? Because she refused to eat.'
- (6) t rhet.g intense
 P-A-T, PEA-BRAIN*, LIVE "WHAT", INDEX-far rt O-C
 'Pat is really dumb! Where does she live? Way out in Ocean City.'
- (7) t rhet.g (gaze rt)
 LEE (2h)alt.CRY, REASON, POSS-rt MOTHER GO-rt
 'Lee's crying because his mother's gone.'

However, rhetorical questions can also be formed with yes-no question structures, as seen in example (8).

- (8) rhet.g neg
 INDEX-rt LEAVE-TO-rt, ME DOUBTwg
 'Will he leave? I doubt it.'

7.4 Negation

The nonmanual marker of negation has been described by Stokoe (1960), Bellugi and Fischer (1972), Liddell (1977/80), and Baker (1980b, and Cokely 1980). The components of this signal (written as 'neg') have been described as: side-to-side headshake, frown, brow squint, wrinkling of the nose, and raised upper lip.

Some of these components are shown in the following illustrations.

(The headshake is, of course, not visible in the photographs.)



neg
ME



neg
FEEL

The 'neg' signal alone can negate an utterance, as seen in examples (9) and (10).

- (9) ME FEEL GOOD ME^{neg}
'No, I don't feel good.'

- (10) "HEY", ME VOLUNTEER ME^{neg}, "WHAT"^{wh-q}
'Hey! I didn't volunteer. What's going on?'

The 'neg' signal may also occur in utterances which include a lexical marker of negation, as seen in examples (11) and (12).

- (11) P-A-T, NOT HERE^{t neg}
'Pat's not here.'

- (12) "HEY", L-E-E NOT MOVE-TO-rt DETROIT-rt^{(gaze rt) neg}
'Hey! Lee's not moving to Detroit.'

ASL has many signs of negation, including those glossed (and illustrated) in Baker and Cokely (1980) as NOT, DON'T, NOT-YET, NEVER, NONE, CAN'T, REFUSE, DENY, THUMBS-DOWN-ON-____, NOT-POSSIBLE, NOT-FAIR, NOT-MUCH, NOT-WORTHWHILE, AIN'T-GOT-NONE, IT'S-NOTHING, NOTHING, NOT-LEGAL/FORBID, and the fingerspelled loan #NG ("no good"). Many of them apparently occur with the 'neg' signal in some contexts but can also appear without it. There has not yet been any study of these differences, nor any general study of environments in which the 'neg' signal is required—other than contexts in which it is the sole carrier of negation.

7.5 Assertion

Both Liddell (1977/80) and Baker and Cokely (1980) talk about the uses of headnodding ('nodding') in certain types of assertions. However, Liddell writes that there are at least several different forms of nodding, which he distinguishes as "rapid slight head nods", "fast head nods", and a "larger, deeper, slower" head movement which he calls 'hn' (1977:46). (Liddell also distinguishes these from "conventional pantomimic head nods" which will not be considered here.)

According to Liddell, the head nod 'hn' can occur either within a clause or after a clause. In both cases, it emphasizes

"that the event [described in the clause] occurred" (1977:47). His examples in support of this analysis are the following¹:

- (13) DOG CHASE CAT
'The dog chased the cat.'

- (14) DOG CHASE CAT hn
'The dog did chase the cat.'

In some contexts, Liddell finds that 'hn' is obligatory. For example, if the verb phrase has been topicalized², the subject must be accompanied by 'hn'.

- (gaze rt)
(15) #CAR BUY, hn SISTER
'As for buying the car, my sister did it.'

However, if only the object has been topicalized, the nod is not required.

¹ Several native Deaf signers have reported discomfort with example (13) and the many permutations of it which appear throughout Liddell's dissertation (to support his claim of an underlying SVO sign order). They complain that it is "too Englishy" and "not good ASL" because neither of the nominal arguments are established in space and CHASE is a directional verb which is normally inflected for 'person' (by its direction of movement in space). I note this problem here since these examples are the only ones Liddell provides in support of this part of his analysis. However, the examples I will provide after this discussion of Liddell's findings generally support his claims about the functions of head-nodding.

² An alternate analysis by M.J. Bienvenu (class presentation, April 1983) suggests that what Liddell here calls a topicalized verb phrase is, in fact, a rhetorical question.

Another context in which 'hn' is obligatory concerns sentences with gapped verbs. Here 'hn' must accompany the object of the gapped verb, as seen in example (16)—taken from Liddell (1977:48.).

(16 HAVE WONDERFUL PICNIC, ME BRING SALAD,
 hn hn hn
 JOHN BEER, SANDY CHICKEN, TED HAMBURGER

'We had a wonderful picnic. I brought the salad, John (brought) the beer, Sandy (brought) the chicken, and Ted (brought) the hamburger.'

Liddell also reports consistently finding 'hn' in existential statements like 'John is a doctor'—which would be signed:

(16a) JOHN hn
 DOCTOR

These findings concerning the functions of 'hn' lead Liddell to conclude that this headnod is "an affirmative or assertive morpheme within a non-subordinate clause" (1977:51) and a "non-lexical predicate of existence" (1977:59).

Concerning the "fast head nods", Liddell writes that they will occur throughout an utterance and are a way for the signer to "insist on the truth of what he is asserting" (1977:43). For example, if someone claimed that 'the dog did not chase the cat', the signer might insist—

(16b) rapid nodding
 DOG CHASE CAT
 'The dog did chase the cat.'

The third type of nodding Liddell describes is what he calls "rapid slight head nods"—the fastest type he has observed in ASL utterances (1977:39). These occur with material which is inserted parenthetically, as seen in (his) example (17). Here the rapid nodding occurs during the sign BROTHER.¹

r.s.nodding
 (17) BILL BROTHER GET #JOB
 'Bill, my brother, got a job.'

Without the nodding during BROTHER, the utterance would mean 'Bill's brother got a job'. Liddell suggests that the parenthetic insertion is "functionally equivalent to an appositive (or reduced non-restrictive relative clause)" (ibid.).

Baker and Cokely (1980) did not carefully distinguish different forms of headnodding as Liddell did, but only noted the occurrence of single nods (written as 'nod') versus repeated nodding (written as 'nodding'). Their data,² however, are supportive of Liddell's analysis and additionally demonstrate the great frequency with which forms of headnodding occur in ASL.

They write that signers often use a nod or repeated nodding "to emphasize that something 'is true', 'did happen', 'will happen', etc." (1980:155). They add that this headnodding is often

¹Liddell also claims that "a specific facial expression is also associated with this parenthetic insertion" (1977:39). However, his photo illustrating this facial expression simply shows the signer mouthing the word 'brother'.

²What is meant by "data" here are approximately 300, often lengthy, examples transcribed from a videotape of a native, Deaf signer as well as similar transcriptions of 27 dialogues (5-6 turns for each signer).

accompanied by a tightening of the closed lips ('tight lips')—which also emphasizes that something 'is true' (or indicates 'I really mean it' when it appears in commands) and which can serve this function in the absence of headnodding, as seen in example (18).



tight lips+nod
WILL



mm+nodding
ENJOY

- (18) t tight lips+neg
L-E-E, COME-here
'Lee's not gonna show up.'

Baker and Cokely, like Liddell, found examples of assertion-related headnods within or after a clause as well as what look like repetitions of these headnods (i.e. 'nodding') throughout an utterance.

- (19) t (gaze rt) nod
TIME-THREE MEETING, ME GO-TO-rt WILL
'I will go to the three o'clock meeting.'

- (20) ACCEPT #JOB INDEX-rt CALIFORNIA STATE-SCHOOL nod
'He accepted a job at the California School for the Deaf, that he did.'

- (21) TOMORROW nodding
#WILL ME GO-TO-store #WILL
'Tomorrow I will definitely go to that store.'
- (22) SEEM nodding
#ALL-arc PEOPLE DEAF, SEEM+
'It seemed that all the people there were deaf
(and I think that's true).'
- (23) FAST WORK REALLY-ADEPT INDEX-rt nodding
'He's a really skilled, fast worker--he sure is.'
- (24) nod nodding
CAN DIFFERENT++-arc VARIOUS-THINGS, CAN*
'(We) clearly could have all kinds of different
(activities), we certainly could.'

Baker and Cokely did include (but did not distinguish) several examples of what they transcribed as 'rapid nodding', seen in (25) and (26).

- (25) neg rapid nodding
ME NOT-YET SEE INDEX-tv, SHOULD+ ME
'I haven't yet seen that show--but I certainly should.'
- (26) cond rapid nodding
ME DISBELIEVE ME, SUPPOSE DEAF, ME ONE-DOLLAR
DOLLAR me-PAY-OUT-TO"each" ME
'I doubt it. If (the actor) does turn out to be deaf, I'll give everyone a dollar. That's what I'll do.'

However, their examples suggest that 'rapid nodding' is not categorically different from regular nodding. Instead, just as the facial modifiers (e.g. 'cs', 'pursed lips') could be performed at various intensities in a continuum-like manner, perhaps head-nodding can also vary in intensity to convey different levels of assertion—e.g. 'is a fact', 'is definitely true', 'I really mean it'. Clearly this is an area calling for considerably more research (nod).

7.6 Topics

The nonmanual signal which identifies a sentence-initial segment as a topic has been noted by Fischer (1975) and described by Liddell (1977/80) and Baker and Cokely (1980). The components of this signal (written as 't') have been described as: brow raise, head tilt slightly backward, and fairly constant eye gaze toward the addressee (except where gaze is needed for establishing spatial locations or pronominal reference). In addition, the final sign in the topic segment is held slightly longer than usual, which gives the appearance of a 'pause' separating the topic from the comment. The nonmanual components of the signal are shown in the following illustrations.



t
MORNING



t
PAPER

Most frequently, the topic is marked with the 't' signal and prolonged final sign, without any lexical marker.

- (27) $\overline{\text{ONE-DAY-PAST MEETING, BORING}^*}$ ^t
'The meeting yesterday was really boring.'
- (28) $\overline{\text{PAST NIGHT GAME, WHERE, NEW-YORK}}$ ^t ^{wh-q} ^q
'Last night's game, where was it? New York?'

Sometimes topicalized segments are preceded by the signs
KNOW-THAT, YOU KNOW, or KNOW (which may have repeated
movement).



However, when these lexical markers occur, they must be accompanied by the 't' signal.

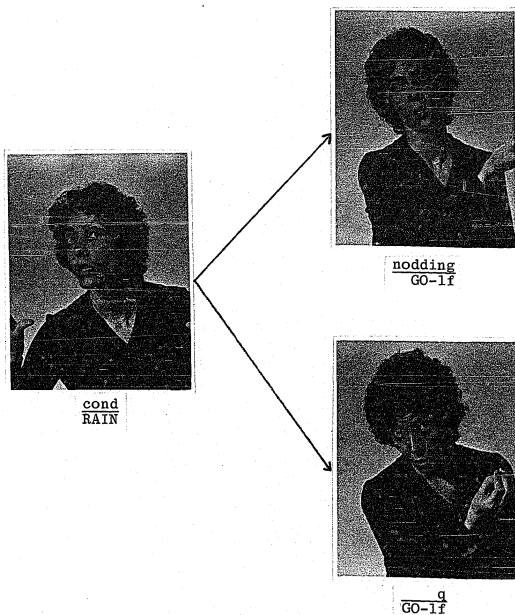
- (29a) $\overline{\text{KNOW-THAT P-A-T, RECENT BUY CAR}}$ ^t ^{cs nodding}
- (29b) $\overline{\text{P-A-T, RECENT BUY CAR}}$ ^t ^{cs nodding}
- (both mean) 'You know Pat, he just bought a car.'

7.7 Conditionals

The nonmanual marker of the 'condition' segment in conditional sentences has been described by Baker (1976a), Baker and Padden (1978), and Baker and Cokely (1980). The components of this signal (written as 'cond') have been described as: a brow raise (although Baker 1976a notes that the brows alternately appear as a squint under certain conditions), head tilt (direction unspecified), and torso slightly inclined in one direction.

At the juncture between the condition and result segments, there is a pause during which each of the nonmanual behaviors change according to the type of result segment which follows. For example, if the result segment is a yes-no question, the brows are usually raised higher, the upper eyelid raised, and the head or torso inclined forward. If the result segment is a wh question, the brows are lowered and drawn into a squint.

The following photographs illustrate the components of the 'cond' signal and then two possible result segments---meaning (a) 'If it rains, I'll go', or (b) 'If it rains, will you go?'. (The 'nodding' during the first result segment is, of course, not visible on the photo.)



The 'cond' signal can function as the sole marker of the condition segment, as seen in example (30).

- (30) cond SATURDAY RAIN, nodding GAME CANCEL
 'If it rains on Saturday, the game
 will be cancelled.'

However, the condition also may be marked lexically with one of the following signs: SUPPOSE, #IF (fingerspelled loan sign), or #IFwg (a 'wiggling' variant of #IF).



cond
SUPPOSE

cond
#IF

cond
#IFwg

When conditions are marked lexically, they still will be signed with the 'cond' signal. (There is no lexical marker—like 'then' in English—of the result segment.)

- (31) cond SUPPOSE WRONG, TEACH AGENT teachers-HELP-you^g
'If you made a mistake, would the teachers help you?'

- (32) (neg)cond #IF NOT-WANT WORK, "GO-AWAY"
'If you don't wanna work, then get outta here.'

7.8 Restrictive relative clauses

The nonmanual marker of a restrictive relative clause ('r') has been described by Liddell (1977/80) as comprising a brow raise, head tilt backward, and raised upper lip (AU 10). He notes, importantly, that there is no pause between the relative clause and the rest of the sentence (unlike the pause which occurs after a topic).

Liddell's photographs of this signal (1977:213) illustrate the sentence 'The dog which recently chased the cat came home'--which he writes as:

(33) RECENTLY DOG CHASE CAT^r COME HOME

In these photos, the signer's head is back, with brows raised (AUs 1+2), lips parted (AU 25), and upper lip raised (AU 10) during each of the four signs in the relative clause. Each of these behaviors is no longer present during the signs COME and HOME.

Liddell also describes three signs, which he calls THATa, THATb, and THATc, that help disambiguate the head of the restrictive relative clause. These signs appear to be related to, or the same as, the signs described in Baker and Cokely (1980) as demonstrative pronouns, shown on the next page.



THAT-ONE
(? THATa)

THAT-ONE*
(?? THATb)

THAT
(? THATc)

These demonstrative pronouns, like the 'cs' adverb which occurs with the sign RECENT, usually appear with a raised upper lip. This fact would lead one to suspect that the upper lip raise shown in Liddell's photos of example (33) is an artifact of 'cs' instead of 'r'—and similarly, that the lip raise accompanying his drawings of THAT relate to that particular group of pronouns and not 'r'. However, in the one (videotaped) example identified by Baker and Cokely (1980:163) as Liddell's relative clause (example 34), the upper lip raise continues throughout the clause—as Liddell claims it would. (And there is no pause between #DOG and MY.)

- (34) $\overline{\text{THAT-ONE*}-\text{rt}} \text{ MAN WITH } \overline{\text{\#DOG MY GOOD-FRIEND}}$
'That guy with the dog is a good friend of mine.'

Liddell also describes what he calls "an intensification of the signal 'r' " (1977:233), involving a more severe contraction of the same facial muscles and either (a) a thrust of the head slightly forward, or (b) a rapid nodding of the head—or both, while the head of the relative clause is signed (1977:243). He uses the notation 'i' over the sign(s) which occurs with this intensification, as shown below (taken from Liddell 1977:245).

$$\frac{i}{r}$$
 (35) THATa DOG BITE CAT COME HOME
 'The cat which that dog bit came home.'

7.9 Summary

The preceding presentation of the syntactic functions of configurations of nonmanual behaviors leads us to the following conclusions:

- *Nonmanual signals play a key role in forming and distinguishing different types of sentences in ASL.

- *Manual behaviors (signs and sign extensions or pauses) can function in complementary ways with the nonmanual behaviors to indicate grammatical meanings.

- *However, manual behaviors rarely are used as the sole indicators of these grammatical meanings.

- *On the other hand, nonmanual behaviors often signal grammatical meanings in the absence of related lexical markers.

- *Descriptions (to date) of each of the nonmanual signals include a specification for head movement or position.

- *Brow position is also frequently specified in the description of nonmanual signals.

*The nonmanual components of each signal are said to co-occur (be coterminous) with the manual string of signs in a given sentence type. (Certain forms of head nods pose an exception to this generalization.)

The preceding presentation also raises many questions concerning the overlap of particular nonmanual behaviors in different signals and how those signals and/or the utterances they identify are actually distinguished. It raises questions about how certain signals can occur together (e.g. q+neg) when they seem to require antagonistic facial actions (e.g. brow raise versus brow squint). It raises questions about how the facial behaviors which serve these syntactic functions are different from those which are related to the expression of emotion. These and other similar questions are addressed in Chapter III.

8.0 Tools for discerning grammatical boundaries

At this stage in our investigation of American Sign Language, we are still unable to define in syntactic or pragmatic terms what are the parameters of the segments we call "sentences". In part, this is because most of the research on ASL has focused

on the analysis of isolated signs and isolated strings of signs that the investigator may or may not have presumed to be sentences.¹

However, two teams of investigators, Grosjean & Lane and Baker & Padden, have proposed different tools for discerning the boundaries of sentences or other grammatical constituents. Hopefully, researchers can apply these tools toward segmenting stretches of discourse into grammatical units, and subsequently, analyze those units in terms of their syntactic components and/or pragmatic functions.

One of the tools concerns the measurement of pauses between signs. Through experimentation, Grosjean and Lane (1977) found that pause duration varies with "importance" of the syntactic break. That is, they found that long pauses (avg. 229 msec) occur between sentences; somewhat shorter pauses (avg. 134 msec) occur between major constituents (e.g. between NP and VP).² However,

¹The implications of this unfortunate reality go beyond the problem of defining sentences in ASL. As McIntire (1980) boldly, and in my opinion, accurately points out, "ASL is exclusively a language used in face-to-face conversation, and the notion of isolating a single sentence is alien to the language and alien to the language users...this issue calls into question any ASL data gathered in a traditional way. At the very least, isolated strings can only provide a beginning of an investigation into ASL syntax. Without the support of discourse data, any conclusion or analysis is tenuous at best and dishonest at worst" (1980:11).

²Of course one should ask how they determined what was a "conjoined sentence", a "simple sentence", or "major constituent" in the first place. It seems that, on the basis of the pause data, they drew sentence surface structure 'trees'—and then presumably analyzed how well these trees matched the way transformational grammar (TG) analyzes similar English sentences (!). Differences in the pause data tree and TG tree were attributed to "performance factors"—rather than the possibility that ASL works differently from English or the assumptions of TG grammar.

an update of this research, reported in Grosjean (1980), found that pause duration was not completely consistent with syntactic structure but was additionally influenced by sentence or constituent length. That is, signers sometimes "displace" the location of a pause in order to "bisect" and, thereby, "balance" sentences or constituents of unequal length (1980:80) Thus, the 'tool' of pause measurement can be helpful in identifying grammatical units, but is subject to error when sentences and/or constituents in a discourse are of unequal length.

The other tools proposed by Baker (1976b, 1977) with Padden (1978) concern observations of the locations of eye gaze shifts, eye blinks, and changes in other nonmanual (face, head, torso) behaviors. For example, Baker (1977) observes that speakers tend to look away from their addressees while initiating a turn and then look back at what appear to be "constituent boundaries" to check on their addressee's decoding. This suggests that analyzing the locations of such gaze shifts would help us understand the structure of ASL.

But there are problems with this approach. For example, Baker (1976a) found that the frequency of such gaze shifting was considerably affected by the nature of the discourse--i.e. was much more frequent in more competitive turn-taking situations where interactants have shorter turns. In long-turn, less competitive sequences, less gaze shifting takes place, and thus provides less potential information about constituent structure. But in competitive turn exchanges, the analysis (of gaze shifts and, hence,

constituent boundaries) becomes complicated by the frequent occurrence in these contexts of discourse overlap and simultaneous turns—both of which require mutual eye gaze. Thus, analyzing the locations where speakers return to positive eye gaze toward the addressee can be helpful in determining grammatical boundaries, but is hardly sufficient information toward this goal.

Another tool proposed by Baker (1976b) and Baker and Padden (1978) is the observation of eyeblink location. That is, they found that speakers (and addressees) tend to blink at constituent boundaries.¹ These boundaries include what appear to be sentence boundaries, breaks between subjects and predicates, and breaks after what are frequently called "time indicators" (e.g. ONE-DAY-PAST, LONG-TIME-AGO). Whereas speakers did not always blink at what they expected to call a major constituent boundary, when they did blink, it was usually at such a boundary.

Baker and Padden found the same pattern for addressees although the addressees blinked only about half as often as speakers blinked. They suggest that addressees aid their own

¹Addressing the problem of circular argumentation, they state "It should be made clear from the outset that when we talk about 'grammatical units' or 'constituent boundaries', we are, in part, begging the question. If we cannot presently specify the formula for a grammatical unit in ASL, then we cannot be sure what the tools we will propose (gaze shifts and blinks) are marking, if anything. However, we are able to determine if they are internally consistent and if their occurrence agrees with our [Padden is a native signer] intuitions concerning unit boundaries and with those of native users of ASL. We are also able to observe whether they co-occur with other behavioral changes [which occur at syntactic junctures]. If their occurrence does match our combined intuitions and the other clues we have relating to the grammatical structure of ASL, then we can begin to use these eye behaviors as a tool..." (1978:35).

decoding by anticipating grammatical boundaries in the speaker's turn. These anticipated boundaries are then revealed by the location of their blinks. Baker and Padden suggest that "analyzing discrepancies in the location of speaker-addressee blinks may reveal (a) what could be a grammatical unit; and (b) how the speaker can deviate grammatically from that unit" (1978:48).

The other obvious tool for discerning grammatical boundaries, alluded to in Baker and Padden (1978), is the location of changes in other nonmanual (face, head, torso) behaviors. As described in section 7.0, configurations of nonmanual behaviors 'appear' and 'go off' or 'change' at the beginning and end of grammatical units—like topics, condition clauses, yes-no questions, and negated statements.

Of all these proposed 'tools', that of observing the location of changes in nonmanual signals proved the most useful to me in segmenting the stretches of continuous discourse that are analyzed in Chapter V. These changes were the most regular (frequent) and easily observable. By their components, they also gave information about the type of sentence or grammatical unit. However, even when I used all of the proposed tools (pauses, gaze shifts, location of eye blinks and other nonmanual, behavioral changes), I still had some problems deciding whether a sign or sign string was part of the previous sentence or constituted a separate sentence. This was particularly true of statements in which there were no signals of negation, assertion, or other syntactic marking.

Chapter III

QUESTIONS AND HYPOTHESIS

In Chapter II, we reviewed the basic research findings concerning the role of nonmanual behaviors in ASL and addressed some of the questions raised by these findings. In this chapter, we will consider some of the underlying assumptions of and expectations resulting from the research findings and try to articulate them in the form of hypotheses. Many of these hypotheses, grouped under the headings of (a) co-occurrence, (b) salience, (c) identification, and (d) distinguishability from affect displays, will then be used to examine the data presented in Appendix A.

1.0 Co-occurrence

Those who study the linguistic functions of nonmanual behaviors generally report, on the basis of their observations, that these linguistic behaviors co-occur with the manual sign or string of signs that they modify. For example, Liddell (1977/80) writes that "the duration of the nonmanual signals is strictly correlated with the manual signs" and that, in fact, such signals (whether related to a particular lexical item or to a whole grammatical string) are "coterminous" with the sign or sign string that they modify (1977:5,26). This observation takes written form with the convention of drawing a line above the glosses for those manual sign(s) with which the nonmanual signal co-occurs, as shown on the next page:

- (1) ME HUNGRY, ^qWANT EAT YOU
 'I'm hungry. You want to eat something?'

Presumably, those behaviors which comprise the 'q' signal 'appeared' with the initiation of the sign WANT, 'stayed there' during the sign EAT, and 'left' (or changed) at the end of the sign YOU. Liddell adds that without this cotermination—for example, if the signal terminates before the last sign in the string—the question is "ungrammatical" (1977:5,24). (And it is this observation which leads us to view shifts in nonmanual signals as a tool for discerning grammatical boundaries, as described in Chapter II.)

However, "co-occurrence" or "co-termination" can be interpreted in several different ways. For example, when we say that a signer's gaze to a particular location "co-occurred" with a pronominal reference to that location, does it mean: (a) the signer began to move his/her gaze toward that location as s/he began to form the manual reference to that location, or (b) the signer's gaze had reached that location by the time s/he began to form the manual reference, or (c) the signer's gaze reached that location at the same time as the manual reference to that location was fully formed, and so on.

That is, when closely observed, each behavior has (a) an onset (e.g. the gaze begins to move in a particular direction, or the facial action begins to appear), (b) a point at which it is 'fully-formed' (e.g. the gaze reaches its destination, or the facial action reaches its highest intensity)—which we will call its apex

onset, (c) a point after which it is no longer fully-formed--called its apex offset, and (d) a point after which it is no longer present, its offset. These points or "locations" are diagrammed below.

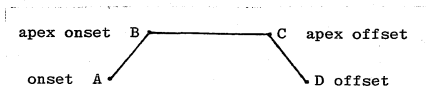


Fig. 3.0 Temporal locations within a given behavior

Returning to the example of eye gaze "co-occurring" with a manual pronominal reference, we could ask whether the onsets of the gaze and manual behaviors co-occur, or is it their apex which co-occurs (i.e. both reach and terminate their apex at the same time), or does the onset of one behavior co-occur with the apex onset of the other behavior--e.g. does the signer begin to make the manual reference just as his/her gaze reaches the location of the referent?

This question becomes more complex when we consider the reports that many nonmanual signals are not composed of a single behavior, but of a configuration of several behaviors. We could ask if the behaviors in such a configuration "co-occur" with each other and what is the form of that co-occurrence. We could also ask if each behavior in the configuration "co-occurs" with the manual sign or string and what is the form(s) of that co-occurrence.

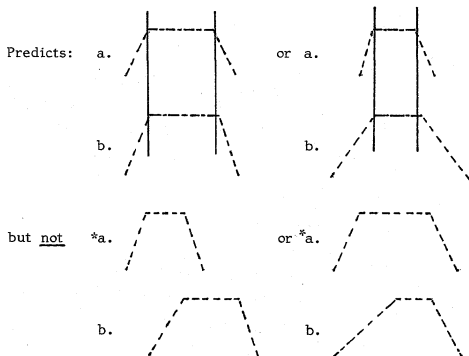
However, some of the behaviors cannot be as neatly analyzed. For example, where is the apex onset of a headshake? —the point at which the head has reached its first full turn to one side? Or, where is the apex onset of a contact sign like SCHOOL? —the point at which the dominant hand begins moving toward the non-dominant hand? —or the point at which it makes contact?

In light of these questions concerning what is meant by "co-occurrence" and the constraints on answering these questions with the same criteria, I developed the following hypotheses:¹

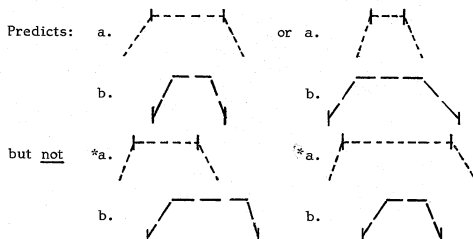
Hyp. 1 - When two or more facial actions are components of the same linguistic signal, they will co-occur (i.e. occur at the same time) in their apex onset, duration², and apex offset.

¹In the predictions following each hypothesis, the lines composed of the short dashes represent facial actions; the lines composed of longer dashes represent movements of the head or gaze; lines with no breaks represent a sign or string of signs.

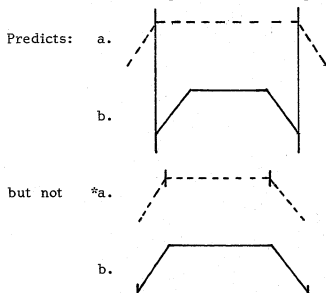
²The word "duration" written after "simple onset" means duration of the entire behavior; when written after "apex onset", it means duration of the apex.



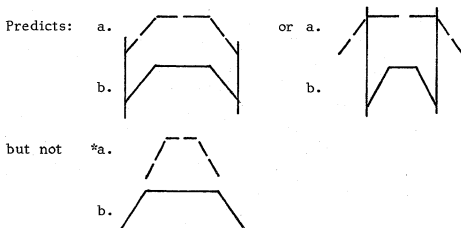
Hyp. 2 - When movements of the head and/or eye gaze are components of a linguistic signal, their simple onset, duration, and offset will co-occur with (i.e. be present during) the apex onset, duration, and apex offset of any facial actions in the same signal.



Hyp. 3 - Facial actions in a linguistic signal will co-occur in their apex onset, duration, and apex offset with (i.e. be present during) the simple onset, duration, and offset of the manual sign(s) in that linguistic unit.



Hyp. 4 - Movements of the head and/or eye gaze in a linguistic signal will co-occur in the simple onset, duration, and offset with (i.e. be present during) the simple onset, duration, and offset of the manual sign(s) in that linguistic unit.



Thus, although I have attempted to transcribe the eye/head and manual behaviors in my data in as much detail as possible, I have made predictions concerning only their total onset, duration, and offset. However, in the case of facial actions, I have made predictions concerning their apex. This is because I am able, with facial behaviors, to make such distinctions systematically, but also because I am hypothesizing that their apex level is significant—as seen in the next section on "salience".

2.0 Salience

Obviously, if a nonmanual behavior or configuration of behaviors is going to serve a linguistic function, it must be perceivable by the addressee. However, since "noise" is generally present in some form while the signers (or interactants in any language) are communicating, the linguistic behavior must not only be perceptible, but salient — i.e. stand out, be easy to see.

In the context of nonmanual signals, I will assume that "salience" can be achieved by 'making the behavior bigger' and/or by including more than one behavior in the signal such that the signal is 'bigger' because it is the sum of perhaps smaller parts. I will test these two assumptions as they apply to facial behaviors:

- Hyp. 5 - Facial actions which serve linguistic functions will, at apex, reach a 'y' (intermediate) or 'z' (peak) intensity level in order to emit a clear visual signal.
- Hyp. 6 - No single facial behavior by itself (e.g. brow raise or brow squint) will be found to serve a linguistic function.

Another related assumption is that two or more nonmanual signals can be combined together and still maintain the perceptual salience of each individual signal. What happens when signals which seem to require opposing behaviors (e.g. brow raise versus brow squint) occur together? How is the salience of each signal preserved?

For example, consider the following photographs of 'neg' (headshake present but not visible in photo), 'q' (signal for yes-no questions), and their combination, 'neg+q' (headshake also not visible in photos). Three of the behaviors which have been described as components of the 'neg' signal are present in the 'neg' photo—brow squint (AU 4), frown (AU 15+17), and head-shake. Three of the behaviors which have been described as components of the 'q' signal are present in the 'q' photo—brow raise (AU 1+2), raised upper eyelids (AU 5), and head forward.



neg
NOT



q
YOU

So what happens when these signals are combined? Does the presence of one obscure the other? Or are the signals still clearly visible?

As illustrated in the 'neg+q' photos, some behaviors may disappear. For example, the frown in the 'neg' photo does not appear at all in the 'neg+q' photos. Other behaviors in a signal may be retained, but appear altered by the presence of behaviors from another signal. For example, the appearance of the brows in the 'neg+q' photos is different from both the 'neg' and 'q' photos; however, to the 'informed eye', both the brow squint and brow raise are clearly visible.



neg+q
NOT



neg+q
REMEMBER

Hypothesis 7 states our assumption that the perceptual salience of each nonmanual signal is maintained when combined with other signals. In attempting to verify this hypothesis, we will need to discover the mechanisms which make it possible to combine signals without obscuring them - e.g. in such signals, the signer will use only facial actions that can co-occur without obscuring each other; or will add other behaviors to increase the salience of an otherwise partly obscured signal; or will increase the intensity level of the facial actions in the signal; or won't allow (via syntactic rules) behaviors that are antagonistic (e.g. headshake and headnod), etc.

Hyp. 7 - When two or more nonmanual signals co-occur, each signal will still be clearly visible.

Another question about combined nonmanual signals concerns the observation that some of the behaviors described as "components" of a given signal are not always present in each

instance of that signal. For example, the behaviors 'nose wrinkle' and 'raised upper lip' are listed as occasional/frequent components of the 'neg' signal but are not present in the preceding photographs. Does this mean those two behaviors are not actually components of the syntactic signal? Or are they part of the signal in certain environments and not in others? Is there such a thing as a "basic form" of a nonmanual signal which can then vary contextually or vary across individuals?

One way to test for these possibilities is to observe what happens to the presumed components of a signal when combined with the components of another signal. For example, consider the following two photographs:



puff.cheeks
HORDES-OF



puff.cheeks+q
HORDES-OF

In the photo on the left, there is a brow squint. (The photo of the male in section 11.5.4.2 making the same sign and signal also shows a brow squint.) Suppose we hypothesize that 'brow squint' (AU 4) is a component of the 'puffed cheeks' signal. This

is similar to the brow squint we described as a component of the 'neg' signal earlier. But what happens when the 'puffed cheeks' signal is combined with 'q'? The brow squint disappears.

So why is the brow squint retained in 'neg+q' (and does this always happen?) but lost in 'puffed cheeks+q' (and does this always happen?)? Is it because 'brow squint' is not really a component of the 'puffed cheeks' signal? Or because it is a component in statements but not in questions (so it won't be confused with 'neg+q'?)? Obviously, there are many possibilities to be considered.

On the other hand, notice that the behavior 'puffed cheeks' is retained in the photo on the right. Similarly, the brow raise, raised upper eyelid, and head forward are retained--the same 'q' components which were preserved in 'neg+q'. Thus, as a research strategy, I will assume that observing which signal "components" are preserved while in combination with other signal behaviors will help us identify which components of a given signal are essential, or a necessary part of that signal. Presumably, these "essential" parts will be present consistently, regardless of the environment.

Hyp. 8 - When two or more nonmanual signals co-occur, the essential components of each signal will be preserved.

3.0 Identification

A quick review of those nonmanual behaviors listed as components of syntactic signals in section II.7 will give two immediate impressions: (a) the components of several signals seem very

similar, and (b) one component of many of the signals is 'brow raise'. In fact, 'brow raise' is listed as a component of the signals for yes-no questions ('q'), rhetorical questions ('rhet.q'), topics ('t'), conditionals ('cond'), and restrictive relative clauses ('r').

Different linguists have tried to make sense of this finding in different ways. (I should note here that the listings in II.7 are a compilation of all of the published observations of these signals to date, whereas various linguists may have assumed that a given signal was composed of only one behavior or fewer than those listed in Chapter II.)

3.1 Different approaches to the problem

For example, McIntire writes that the same signal which is used to mark yes-no questions also marks rhetorical questions (1980:9). However, the only behavior in 'q' that she mentions is the brow raise. Similarly, she notes a difficulty in distinguishing 't' and 'r' (1980:50).

Coulter asserts that 't' and 'q' are homophonous (1979:33). He also claims that "ASL does not have a conditional construction [nonmanual signal] which is morphologically distinct from the topic construction" (1979:31) and that 'r' is actually composed of 't' (meaning raised brows) + what he calls "the definite description marker" (meaning raised upper lip) (1979:40). Similarly, he analyzes what he calls "when" and "goal" ('rhet.q'?) constructions, meaning the nonmanual signals which accompany the signs

in these clauses, as "examples of a single syntactic construction, which is interpreted differently according to its context" (1979:31).¹ This single syntactic signal is 't'—the topic marker (which, for Coulter, is a brow raise). Contrary to the descriptions of the syntactic signals in 11.7, Coulter claims that each of the above signals occurs with a "raised chin"—by which I think he means a head tilt backward. He also does not talk about other co-occurring behaviors like movement of the torso in conditionals or raising the upper eyelid in yes-no questions.

Liddell notes some of the same similarities in signal components, but observes ways in which the signals differ as well. For example, noting that both 't' and 'q' involve a brow raise, he observes that they differ in their respective head movements and claims that that difference is what distinguishes them. "If the head is tilted back....a topic is being marked. If the head is forward...(with or without any forward position of the body), a question is being asked" (1977:126).

This difference would seem to neatly distinguish 'q' from 't', and subsequently, from the other signals which include a brow raise but not forward head movement (i.e. 'cond', 'r', and 'rhet.q'). However, Liddell also comments that the "brow raise, head forward, and body forward" components of 'q' constitute "the fullest form of the question signal", but that "sometimes a

¹ Unfortunately, he gives only one example of each type of sentence (the same two examples that appear in his 1980 paper), so it's not clear to me what he means by "goal". He also doesn't explain what he means by "context".

brow raise alone is sufficient to signal a yes-no question" (1977:33).¹ If this were true, then the signal in its most minimal form would not be distinct from the other signals--unless we could specify some behavior(s) unique to each of them which is always present with each respective signal. (At the time of Liddell's writing, 'rhet.q' had not yet been described; he did not discuss 'cond'; and he described both 't' and 'r' as having a head tilt backward, but that 'r' also had a raised upper lip and no pause after the clause.)

Similarly, Liddell notes that not all headshakes have a negating function, and that it is other co-occurring behaviors which distinguish the 'neg' headshake from other headshakes. An example of a different headshake is that which sometimes occurs with wh-word questions, as illustrated below.



wh-q
#DO-DO

'What are you gonna do?'

¹This conclusion is somewhat surprising in light of the fact that the photos of 'q' during the sentence WOMAN FORGET PURSE on the previous page (p.32) show a clear raised upper eyelid (AU 5) and head forward, but minimal, if any, evidence of a brow raise.

Liddell claims that the co-occurring behaviors which distinguish the 'neg' headshake are its "accompanying facial expression" and "vertical orientation of the head" (1977:60). He describes this facial expression, illustrated with photographs, as one where the eyes are narrowed, the sides of the mouth are pulled down (AU 15), the upperlip is raised (AU 10), and the lower lip is pushed up (AU 17).¹

However, as seen in the other photos of 'neg' in sections II.7.4 and III.2, this combination of facial actions is only one of several which may occur with 'neg'. For example, none of the three photos of 'neg' in the sections above show evidence of AU 10; only two show AU 15 or AU 17. Those three also clearly include a brow squint (AU 4), whereas the photos in Liddell's illustrations of 'neg' (1977:61) show no visible difference in brow or eyelid position from his "neutral" photos (p.31) of the same person.

3.2 Weaknesses in the research

These discrepancies point to three widespread problems in our field which should be evident by this point. First of all, all of us who have done studies of nonmanual behaviors in ASL have made too many generalizations on the basis of too little data—often

¹I have added the AU classifications based on Liddell's corresponding photographs.

making claims from observations of only one informant (language consultant). Another example of this can be found in Baker (1976a) who, from observations of one informant, claimed a distinction between "emphatic eye closure" and normal blinking on the basis of the length of the eye closure. However, in her 1976a paper, she had to partially retract this claim since it did not hold up in the same way for other signers. (The first informant had an unusually small palpebral fissure!) Coulter (1979) claims that "the wrinkled nose intensifies the value of the facial expression it accompanies" (p. 40), but doesn't provide any evidence to support his claim! Similarly, he provides only one or two examples for other, major claims.

Secondly, our descriptions of nonmanual behaviors have often been imprecise, contradictory, or incomplete, and hence, often inaccurate. Several examples of this have already been mentioned. We have obviously suffered from a lack of training in recognizing differences in facial and head movements. Our research has also suffered from the lack of an adequate transcription system with which to code these differences. Adding to our confusion, we have used different words or phrases to describe the same event--Liddell's "narrow eyes" seems to be Reilly and McIntire's "brow squint"; Coulter's "lifted chin" seems to be Liddell's "backward head tilt"; Coulter's "head nod forward" seems not to be Liddell's and Baker's "head forward", but instead to be what I am now calling "head downward"--which, in fact, is not a "nod". And with the exception of Liddell (1977/80) and Baker and Cokely

(1980), we have not provided illustrations of the corresponding facial and head movements so that others could figure out what was meant by those labels.

Thirdly, with the exceptions of Baker and Cokely (1980) and McIntire (1980), most of our examples have been isolated sentences. McIntire's warning about the quality of this kind of data has already been noted (see 11.8). However, we have additional reasons to be wary of using isolated sentences for the analysis of nonmanual and, in particular, facial, behaviors.

As we know from the work of those in the field of "nonverbal communication" or body movement, the face (and head) can express many different kinds of information, notably emotions. And as any informed viewer can observe, signers often express their affect facially at the same time as their head, face, and eyes are involved in the expression of grammatical signals. We know very little about how to distinguish affect from syntax when it comes to describing facial behaviors, as will be considered in section 4.0. We also don't know what possible effects the syntactic environment preceding an utterance may have on nonmanual signals.

Without knowing the linguistic and social context in which an utterance occurs, we may easily assume the observed behaviors are a product of the 'simple' event we want to study when, in fact, they are influenced by several different factors. And if, as McIntire claims, signers are uncomfortable with isolated sentences and will try to provide contexts (despite the requests of the linguist), even if the contexts are "only in the signer's head", we

had better find out how they may be influencing the behaviors we are observing. Perhaps, for example, this will help us understand the differences between Liddell's (1977) 'neg' facial behaviors and those illustrated in Baker and Cokely (1980).

3.3 Sentence types: summary chart

The chart on the next page is a summary listing of all behaviors that researchers have observed to be present with a particular type of sentence. A '+' sign means at least one researcher has said that behavior is present. Parentheses around a '+' sign mean the behavior has been described as occurring in only certain instances of that sentence type—or (in the case of assertions and wh questions) that the behavior was illustrated in published works but not explicitly mentioned. In the column on the right marked "sign", the '+' for wh questions means that sentence type has been described as consistently including a wh-word sign; the '✓' marks in the rest of the column mean that signs which help mark these sentence types do exist and may occur, but are not described as necessary markers of those sentences.

The chart points to several possibilities worth testing. For example, that no two sentence types occur with exactly the same configuration of behaviors; that (with the possible exception of assertions) all of these signals involve brow movements; that relatively few of the signals involve movements of the lower face; that all of the signals involve a behavior of the head, but for

	FACE							HEAD					TORSO		EYES	HANDS	
	Upper				Lower			head forward	head back	head side tilt	head nod	head shake	torso forward	torso to side	+ eye gaze	sign	pause
	brow raise	brow squint	eyes wide	upper lip raise	nose wrinkle	frown	lips pressed										
AU	1 + 2	4	5	10	9	15 (+ 17)	24										
q	+		+					+						+		+	/
wh-q		+								+		(+)			+	+	/
rhet.q	+									+					+	/	/
neg		+		+	+	+						+				/	/
assertion		(+)					+				+					/	/
topic	+	/							+						+	/	+
cond	+	(+)								+				+		/	+
r	+			+					+		(+)					/	-
when clause	+															?	? +

Fig. 3.1 Sentence types: summary of observed behaviors

most, this is a 'position held' rather than a repeated movement like nodding or shaking.

To test some of these (and other) possibilities, I propose the following "strong" hypotheses:

Hyp 9 - Each configuration of nonmanual behaviors which serves a syntactic function can be distinguished from all other configurations of nonmanual behaviors which serve different syntactic functions.

Hyp. 10 - A simple (non-negated or asserted) declarative sentence can be identified by an absence of any upper face actions or head movements co-terminous with the sentence.

Taking a "Freudian approach" to facial behavior in ASL, I propose that:

Hyp. 11 - With the possible exception of those behaviors marked on the chart (columns 4-7), all lower face actions in ASL utterances can be accounted for as either: (a) components of or modifiers of signs, (b) related to the (deliberate or spontaneous) display of affect, (c) due to the 'mouthing' of English words, or (d) "adaptors" (Ekman & Friesen 1969), like licking one's lips.

Hyp. 12 - All upper face actions in ASL utterances can be accounted for as either: (a) components of syntactic signals, (b) components of modifiers of signs (e.g. the 'intense' signal), or (c) related to the display of affect (e.g. surprise, interest), including phenomena analogous to the expression of affect via intonation in hearing speakers.

4.0 Distinguishability from affect displays

As mentioned in the previous section, we know that behaviors (like brow raise) which occur in syntactic signals (like 'q') can also occur in affect displays (like surprise), but we don't know how to distinguish their occurrence in one from the other. So, for example, if we see a raised upperlip (AU 10) in a negated statement, it is often not clear whether that behavior is due to the negation or the signer's affect (e.g. disgust, contempt).

Liddell (1977/80) briefly addresses this question. He suggests that, unlike their appearance in grammatical signals or modifiers, facial behaviors which express emotions are characterized by their "non-constancy"; "the expression 'develops' and changes during the string...and the head does not stay fixed" (1977:83).

Theoretically, there are several ways in which this "inconstancy" could appear. For example, the expression could rapidly move to its apex (as might happen in the case of genuine surprise) and then slowly decrease to final offset, as diagrammed below:



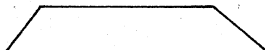
Or, the expression could gradually "develop" to its apex, as I have seen happen with smiles (AU 12) in the context of joke telling.



Or, the expression could conceivably have a relatively short onset and offset but vary in its period of apex.



These examples of "non-constancy" then can be contrasted with the observed regularity of facial expressions in grammatical signals, which generally look like this:



To test these proposals, I hypothesize that:

- Hyp. 13 - Facial actions which serve linguistic functions will be characterized by sudden onset (rapid movement to apex), little change during apex duration, and sudden offset.
- Hyp. 14 - Facial actions which express (felt)¹ emotions will be characterized by either (a) comparatively slow onset, (b) comparatively slow offset, and/or (c) variation in intensity during apex.

Another potential difference between linguistic versus affective expressions may be their timing with respect to sentences or other grammatical units. As described in the first section of

¹Ekman and Friesen (1982) find that the parameters (e.g. timing, location) of facial expressions due to "felt" emotions may differ from those which are deliberate attempts to 'show' an emotion. Liddell's example of what he describes as a surprise "emblem" in an ASL sentence also suggests that the parameters of this type of facial behavior may be different from those of felt emotions (Liddell 1977:83).

this chapter, nonmanual linguistic signals are observed to be co-terminous with the grammatical constituents they mark (like 'q') or modify (like 'th'). However, we have no reason to expect this kind of "temporal agreement" with the expression of felt emotions. Thus, Hypothesis 15 directly contrasts with Hypothesis 3.

Hyp. 15 - Facial actions which express (felt) emotions will not co-occur in their apex onset, duration, or apex offset with the simple onset, duration, and offset of the manual signs in a particular grammatical unit.

Another potential difference concerns the particular configurations of facial behaviors which express emotions. Just as I have hypothesized that nonmanual configurations which serve grammatical functions will be distinguishable from each other, I propose that configurations of facial actions which express emotions will be distinguishable from those which serve grammatical functions.

Hyp. 16 - Combinations of facial actions observed to occur in specific expressions of emotion (e.g. 1+2+5+26 in 'surprise') will not serve as grammatical signals.

These are the hypotheses I will use to analyze the data in Chapter V.

Chapter IV

DATA BASE AND CODING PROCEDURES

1.0 Data base

1.1 Videotaped conversations

In the summer of 1975, two dyadic (male-male, female-female) ASL conversations of about 45 minutes each were recorded in a television studio at Gallaudet College. Six video cameras were used simultaneously to provide for each conversation: a facial close-up of each signer (for transcribing movements of the signer's eye gaze, facial musculature, and head), a split-screen combining upper body shots of both signers (to aid observations of regulators and other interactive behaviors), a long shot of the entire conversational situation with both signers' full bodies visible (for transcribing all manual behaviors and shifts in body posture), and a synchronous, digital reading in minutes, seconds, and tenth-seconds at the bottom of the four resulting tapes (fed into each tape with a special effects generator). Later, a second reading which marks each videofield (1 field = 1/60 second) was added to each tape (via a numbers generator). This was done because the smallest time units marked on the first reading (i.e. 1/10 sec, which equals 6 videofields) was still too large to record the rapid changes in facial behavior observed in these conversations.

1.2 Informants

The participants in each conversation are Deaf, native users of ASL. That is, all have deaf parents, acquired ASL in the home (three also have deaf siblings), attended residential schools, and have lived most of their lives in close association with other Deaf people like themselves. On a questionnaire, all four identified themselves as culturally Deaf.

The two females, Wanda (F1) and Cinnie (F2), grew up in California (one southern, one northern) and were aged 23 and 19, respectively, at the time of the filming. The two males, Larry (M1) and Brian (M2), were aged 28 and 25, respectively, at the time of filming. Larry attended the Michigan School for the Deaf for 14 years; Brian attended the Maryland School for the Deaf for 3 years and the North Carolina School for the Deaf for 9 years. All had been or presently were (at the time of filming) students at Gallaudet College. The females had known each other for several years and were casual friends. The males were close friends who had not seen each other for three months.

1.3 Instructions and setting

The participants in each conversation were recruited (and paid for their time) by another deaf, native signer who instructed them (in ASL) to discuss anything of mutual interest. Casual topics (e.g. mutual friends, recent events) were suggested, but the participants generally chose their own topics and had no difficulty in finding areas of mutual interest.

Prior to and during the filming, the deaf confederate was the only person who interacted with the participants. All other personnel (all hearing), such as the film crew, stayed out of sight as much as possible (almost all the time) in order to avoid encouraging code-switching among the participants and to reduce the artificiality of the situation. Both dyads reported that during the conversations, after an initial adjustment period, they were able to ignore almost completely the equipment and recording situation. This seemed to be particularly true for the males—who frequently shared opinions and information that presumably one would not want made public.

During the first half of each filming period, the participants conversed while standing. They chose what they felt to be a comfortable distance apart while facing each other (which was approximately six feet) and the cameras were adjusted to their positions. The same procedure was followed during the second half of the filming period when participants were given upright (armless) chairs to sit in. The signers were filmed in both positions (standing, sitting) in order to measure what, if any, effects these changes in body position and mobility might have on their communicative (regulatory and linguistic) behavior.

1.4 Selection of segments

The selection of segments and actual coding of these segments at various levels occurred over a four-year period. Initially, the segments were chosen from several long (e.g. one minute) stretches

of discourse which had been transcribed, with English glosses for signs, by a deaf, ASL/English bilingual and then translated into English (by the same person).

Although I wanted to study a range¹ of phenomena, I particularly selected for detailed coding those segments which were followed by a question mark in the English translations. At that time, some of the nonmanual concomitants of yes-no questions had already been formally identified. I was interested in examining these questions in more detail as well as in studying wh questions and rhetorical questions to discover possible differences in the nonmanual behaviors which might accompany them.

Later, I trained another Deaf, native signer to identify different types of questions (based on their functions²) and record the locations and glosses for these utterances in other portions of the videotapes. (A similar procedure was used to locate examples of negation, topicalization, and conditionals.)

From these two sources, I selected 40 segments for detailed transcription, trying to select as varied a sample as possible. Of the 40 segments, 30 are from the male-male dyad (17 speaker segments of M1 and 13 of M2). More focus was given to the male

¹Actually, ludicrous as it now seems, I initially planned to "define and describe in detail the linguistic functions of non-manual behaviors in ASL conversation" (Baker 1978:1). I didn't know that would require a life-long project!

²That is, I described how yes-no questions and wh questions ask for different kinds of information and require different kinds of responses, but that in rhetorical questions, you don't expect the person to respond because you plan to do so yourself; you just use the question to introduce the idea.

dyad because one of the female signers used considerable mouthing of English words (which is not uncommon at Gallaudet) and I wanted to avoid such intrusions from English as much as possible. Of the remaining 10 segments, 6 speaker segments are of F1 and 4 of F2.

These 40 speaker segments range in length from 1.3 to 13 seconds and total approximately three minutes. They include about 65 questions (of the three types mentioned previously) and about 40 statements (including those marked by headnodding or head-shaking). All of the observed linguistic (manual and nonmanual) and regulatory behavior of the addressee in each segment was also coded.

2.0 Coding procedure

Following the 5-channel distinctions of Baker (1976a) and Baker and Padden (1978), all movements and positions of the speaker's (1) face, (2) eye gaze, (3) head, (4) torso/body posture, and (5) hands and arms were coded separately for their type (classification) and timing (location) within the segment. These separate codings were then recorded together along a "time-line" representing that speaker segment.

Each timeline is divided into units of time corresponding to 1/60th second (or 1 videofield). All behaviors within each channel were coded in terms of continuations or changes every 1/60th second. Thus, the synthesis of all observed activity within each segment along the same timeline provides a measure of simultaneity (defined by co-occurrence within the same 1/60th second

time unit) as well as temporal sequence.

In the next sections (2.1-2.4), I will describe the different systems used to transcribe, as phonetically as possible, all activity within each channel.

2.1 The face

Ekman and Friesen's (1978a) Facial Action Coding System (FACS) was used to code numerically all facial behavior within each speaker segment. FACS is an anatomically based, descriptive system which specifies a set of 44 elemental Action Units (AUs). These AUs, when combined, can presumably account for any observed facial movement. With a few exceptions, the Action Units have a one-to-one correspondence with single muscles as defined by anatomists.

Coding with FACS involves observing both movement and resultant appearance change. Scoring of these observations is highly rule-governed (to achieve acceptable reliability) and adheres to a 'logic' in the form of Co-occurrence Rules. These rules specify how co-occurring facial actions should be coded numerically.

FACS is primarily concerned with classification. That is, it focuses on identifying what happened -- what are the AUs responsible for an observed change in facial behavior. It also specifies a way of coding the intensity level of five of the AUs, using the letters X, Y, and Z to refer to low (X), medium (Y), or high (Z) levels.

2.1.1 Reliability test: classification

In January-February of 1977, I was one of six persons who learned FACS during a seven-week period (working about half-time) and then participated in a test of its reliability. The test involved scoring 34 samples of facial¹ behavior from a videotape of various individuals. I obtained a .859 mean ratio of agreement with the "experts" (which is considered very good for this kind of elaborate coding). More information concerning this reliability test is available in a document entitled "Reliability of the Facial Action Coding System" (August, 1977) by Paul Ekman and Wallace Friesen, Human Interaction Lab, University of California, San Francisco.

The level of agreement in scoring AU intensities was not reported for each individual, but was lower for the group as a whole (.55) than the group's performance on the classification measure (.822). About half of the intensity "disagreements" were due to the fact that a person forgot to score an intensity for a particular AU which required it.

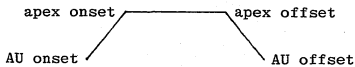
2.1.2 Reliability test: location

As described in the previous section, FACS focuses on discerning what happened, but does not provide instruction concerning how to identify when the facial action happened with respect to

¹The test also measured reliability in scoring head/eye movements following an ancillary section of FACS. The results obtained were about the same as that for facial actions. However, I did not use this system for my own recording of head/eye movements.

other possible actions. However, in Chapters II and III, we saw that a measurement of the exact location of an action and of the period of its greatest intensity (apex) is needed to understand how certain facial behaviors serve linguistic functions in ASL and how they may differ from other facial behaviors.

Thus, for this study, in addition to identifying which AU occurred, the exact beginning (AU onset) and end (AU offset) of the facial action was scored as well as the beginning and end of the period of its greatest intensity (apex onset, apex offset). These four locations were defined as: (1) the videofield when the AU first started to contract (AU onset), (2) the videofield when the AU first reached apex (apex onset), (3) the last videofield of the apex (apex offset), and (4) the last videofield in which the AU is visible (AU offset), following the conventions proposed by Ekman and Friesen (1978c).



A second reliability test was then done to measure how well these four locations could be discriminated. Observing that the faces of signers during ASL conversations seem much more active than the faces of hearing interactants (during English conversations), I chose for this test a continuous segment from one of the ASL conversations. Thus, we could find out how well FACS works with Deaf signers' faces as well as measure our ability to

discriminate the locations described above with this sample.

For this test, Dr. Linda Camras (a psychologist who was also a member of the 1977 training group) and I independently scored the facial behavior of M1 during a 6.3 second (speaker) segment of the facial close-up videotape. This segment included a variety of linguistic contexts (topicalization, negation, statements, rhetorical question, conditional, emphatic stress) and required approximately 20 hours to score (per coder).

In addition to the scoring procedures of FACS and the definitions of the four locations (stated above), I added the following instructions:

- (1) Score all lower face AUs for entire segment first then score all upper face AUs.
- (2) Be conservative! If the beginning of an AU/apex seems to be between two fields, score the latter field. If the end of an AU/apex seems to be between two fields, score the former field.
- (3) Be liberal! If you are not sure between two intensity scores (i.e. X or Y, Y or Z), score up (i.e. the greater intensity).
- (4) A timing rule: score the period of each intermediate intensity level if it is held ≥ 10 fields. That is, if any intensity level is maintained for ≥ 10 fields before increasing to a higher intensity (e.g. X to Y) or decreasing to a lower intensity level (e.g. Y to X), then score each intensity level separately.
- (5) When there is movement from AU 25 to AU 26, only score AU 26 (unless they clearly represent separate actions).

A. Classification: Both coders agreed on the classification of 24 facial actions and disagreed on 6 actions. So the agreement level was .80. Four of the disagreements occurred when one scored an action that the other did not score (marked as 'Ø'). The other

two disagreements concerned AUs which result in similar appearance changes, as shown in Figure 4.0.

<u>Event</u>	<u>Coder A</u>	<u>Coder B</u>	<u>Rules</u>
7	0	AU 17	
12	AU 18	0	
14	AU 16	0	
15	AU 20	AU 15	15@20 ESQ
18	AU 18	0	
28	AU 44	AU 6	6 44

Fig. 4.0 Classification disagreements

The total number of "events" was tabulated by taking the number of AUs where both coders agreed (24), counting the places of disagreement (6, as shown above), and adding these two numbers together, totaling 30. However, another way to interpret these scores would count events 14 and 15 (see Figure 4.0) as the same event. This is reasonable because the AUs involved result in similar appearance changes and they are located in the same general time frame, as shown in Figure 4.1. (The onset, intensity, and offset numbers correspond to the number of the videofield.)

	<u>AU</u>	<u>Onset</u>	<u>Intensity</u>	<u>Offset</u>
<u>Coder A</u>	16	517	x	548
	20	521	z	558
<u>Coder B</u>	15	519	z	553

Fig. 4.1 Disagreements (events 14 and 15)

If events 14 and 15 are counted as one event, the total number of events drops to 29, yielding a 24/29 agreement ratio or

.83—instead of the .80 calculated above. Either way, this level of agreement is reasonably good.

B. Location: Agreement on location was calculated for those 24 events which the coders identified with the same classification (AU number). The data for this analysis is presented in Figures 4.2 and 4.3. (Again, the onset and offset numbers correspond to the videofield number.)

Figure 4.2 shows the level of agreement for both AU onset and AU offset to be very high, with a few exceptions. The major exception concerns the onset of Event 8, which involves the simple action of parting the lips (AU 25). Coder B said AU 25 began at the same time as the lips began to pucker (AU 18, Event 6). Coder A said AU 25 did not appear until AU 18 had passed its apex.

It is likely that this discrepancy reflects an ambiguity concerning how to apply certain FACS rules when scoring locations. That is, FACS specifies that to score AU 25, the space between the lips must be at least 2 millimeters (the thickness of two quarters). Subsequent observation of this segment indicates this minimal requirement clearly was not met during the apex of AU 18—which would mean Coder A was correct according to FACS.

However, such minimal requirements are specified in order to obtain good reliability for classification of AU. The ambiguity arises when one has identified a particular AU and goes back in time, knowing that it's going to appear later, to look for its onset. If one decides that "AU onset" will correspond to the first field when the AU meets minimal requirements, then the ambiguity is taken away. However, if one wants to record actual AU onset,

Event	AU	Onset of AU		Difference	Offset of AU		Difference
		Coder A	Coder B		Coder A	Coder B	
1	17	318	318	-*	327	327	0
2	26	321	318	3	366	366	0
3	17	365	367	2	376	375	1
4	32	367	367	0	375	375	0
5	25	376	376	0	381	379	2
6	18	383	383	0	417	413	4
8	25	413	383	30	423	422	1
9	17	422	423	1	430	430	0
10	14	431	430	1	440	440	0
11	14	464	468	4	492	492	0
13	26	515	515	0	555	553	2
16	12	557	556	1	567	567	0
17	12	574	574	0	598	596	2
19	15	569	567	2	573	573	0
20	26	568	567	1	599	598	1
21	15	597	597	0	606	605	1
22	17	597	597	0	603	603	0
23	18	604	606	2	614	614	0
24	26	604	604	0	626	625	1
25	1	318	318	-	358	356	2
26	4	318	318	-	595	595	0
27	1	365	367	2	591	590	1
28	1	595	591	4	650	643	7
29	2	595	591	4	650	643	7
30	5	600	608	8	633	632	1

Fig. 4.2 Location scores: AU onset/offset

*A dash indicates that that AU was present on the first field of the segment, which here means that the onset numbers do not represent an actual onset of the AU. Hence, no difference is calculated.

Event	AU	Onset of Apex		Difference	Offset of Apex		Difference
		Coder A	Coder B		Coder A	Coder B	
1	17	319	318	1	321	322	1
2	26	325	328	3	360	356	4
3	17	371	371	0	372	371	1
4	32	371	371	0	372	371	1
5	25	376	377	1	378	378	0
6	18	385	399	14	412	408	4
8	25	417	399	18	420	419	1
9	17	425	426	1	427	427	1
10	14	434	434	0	437	437	0
11	14	479	482	3	489	487	2
13	26	520	518	2	544	539	5
16	12	563	561	2	565	563	2
17	12	577	579	2	592	591	1
19	15	571	571	0	572	572	0
20	26	571	571	0	596	596	0
21	15	601	601	0	604	603	1
22	17	599	600	1	601	601	1
23	18	609	610	1	612	612	0
24	26	614	613	1	-*	618	-
25	1	323	323	0	327	326	1
26	4	323	323	0	414	591	177
27	1	375	375	0	382	495	113
28	1	600	607	7	641	632	9
29	2	600	607	7	641	632	9
30	5	600	610	10	633	616	17

Fig. 4.3 Location scores: apex onset/offset

*The dash here means a score was not recorded.

then, for a small number of AUs (like AU 25), this will mean recording a time earlier than the time at which the minimal requirements are met. This latter way of thinking may be what influenced Coder B's earlier recording of onset time since AU 25 was present during the apex of AU 18 but had not, at that point, met the minimal requirements for scoring it—which may be the reason for Coder A's later score. However, it's also possible that Coder A simply did not see the presence of AU 25 until after the offset of AU 18. (The 8-field discrepancy in the AU onset of event 30 will be considered in a more lengthy discussion of differences in the scoring of apex onset/offset for that event.)

Figure 4.3 also shows a generally high level of agreement in the scoring of apex onset and apex offset, with five note-worthy exceptions involving events 6, 8, 26, 27, and 30. Events 6 and 8 seem to involve fairly simple errors in the scoring of apex onsets for AUs 18 and 25. In both cases, subsequent viewing clearly shows that Coder A scored the apex onset of AU 18 before it had actually reached apex and that Coder B had done the same thing with the apex of AU 25.

Events 26 and 27 show major differences in the scoring of apex offset. The AUs in these events draw together and lower the brows (AU 4) and raise the inner portion of the brow (AU 1). According to both coders, AU 1 appears after AU 4 has reached apex, and the apex period of AU 1 is over before the apex offset of AU 4, as shown in Figure 4.4. Both coders also find that AUs 1 and 4 end at approximately the same time (4-5 fields difference). However, in both cases, Coder A scored the apex

duration as shorter than that scored by Coder B.

	<u>AU Onset</u>	<u>Apex Onset</u>	<u>Apex Offset</u>	<u>AU Offset</u>
<u>Event 26: AU 4</u>				
Coder A	318	323	414	595
Coder B	318	323	591	595
<u>Event 27: AU 1</u>				
Coder A	365	375	382	591
Coder B	367	375	495	590

Fig. 4.4 Events 26 and 27

One fact which helps explain these major differences in the scoring of apex offset is that both apexes (of AUs 1 and 4) were "pulsating". That is, they did not maintain the same degree of intensity during their apex, but pulsated (Ekman and Friesen 1978b) as diagrammed below.



On their scoresheets, both coders noted that AU 1 had a pulsating apex, and Coder A also noted this for AU 4 and marked some of the intensity differences, even though the periods of lower intensities were less than 10 fields (and thus did not require, according to rule #4, separate scoring). Coder A also scored the intensity level for all AUs in the segment (which Coder B did not do due to miscommunication). She noted that AU 4 pulsated primarily within the 'Y' intensity level, but that AU 1, after a short (8 field) 'Z'-level apex, pulsated slightly below that 'Z' level.

It is most likely that the major differences in Coder A and Coder B's apex offset scores of events 26 and 27 are due to the pulsating nature of both apexes. Secondly, the differences likely reflect the fact that the 'Y' intensity level in the 3-point (X, Y, Z) scale includes distinguishable degrees of intensity.¹ Thus, whereas the pulsations of AU 4 primarily fell within the 'Y' level, Coder A judged that the pulsations after videofield 414 did not reach as high an intensity as those prior to it. Hence, she judged that the actual apex of AU 4 was shorter than that scored by Coder B.

Another important difference in scores appears in Event 30, which concerns AU 5. AU 5 raises the upper eyelids, giving a "bulging" appearance to the eyes or what is often called a "widening" of the eyes. As shown in Figure 4.5, the AU 5 in this event occurs while the signer's brows are raised (AUs 1+2, events 28 and 29).

	<u>AU Onset</u>	<u>Apex Onset</u>	<u>Apex Offset</u>	<u>AU Offset</u>
<u>Event 28: AU 1</u>				
Coder A	595	600	641	650
Coder B	591	607	632	643
<u>Event 29: AU 2</u>				
Coder A	595	600	641	650
Coder B	591	607	632	643
<u>Event 30: AU 5</u>				
Coder A	600	600	633	633
Coder B	608	610	616	632

Fig. 4.5 Events 28, 29, and 30

¹Recognizing this problem and its negative effect on intercoder reliability, Ekman and Friesen now use a 5-point scale.

Both coders place the presence of AU 5 during the apex of AUs 1+2, and both generally agree about the offset of AU 5. However, Coder A scores AU 5 as onsetting 8 fields before Coder B's score. More importantly, Coder A then signals her inability to distinguish, in this context (AUs 1+2 are at 'Z' level), any increase/decrease in AU 5 other than its presence/absence by coding the same times for AU onset and apex onset and for apex offset and AU offset. Hence she records an apex duration which is as long as the AU duration.

The difference between Coder A and Coder B for AU onset has two different, possible explanations. One relates to the fact that a strong 1+2 can itself raise the upper lid slightly, and Coder A may have mistaken this artifact of AUs 1+2 as an indication of the presence of AU 5. The second possible explanation is that Coder B may have been waiting for AU 5 to meet the FACS minimal requirements for scoring in the context of AUs 1+2 whereas Coder A scored its 'actual' onset (similar to the problem described earlier of AU 25 in the context of AU 18).

C. Summary

The results of this test show a high level of agreement for coding all four locations in the timing of facial actions: AU onset, apex onset, apex offset, and AU offset. The average difference in the two coders' scores for each location is shown below:

	<u>Average Difference</u>	<u>Data Excluded</u>
AU onset:	1.67 fields	event 8
apex onset:	1.45 fields	events 6,8,30
apex offset:	2.09 fields	events 26,27,30
AU offset:	1.32 fields	---

Fig. 4.6 Average differences in location scores

(1 field = .017 second)

The major exceptions to this high level of agreement, involving events 6, 8, 26, 27, and 30, point to several problems for location scoring. In subsequent coding, I tried to compensate for these problems in the following ways:

- (a) Although I continued to use the 3-point intensity scale,

I coded (on my score sheets) the distinctions 'high' and 'low' for the upper and lower areas of 'Y'. I also used 'MR' in instances where I wasn't sure if an AU met minimal requirements.

(b) I used the term "pulsating" on my score sheet to mark all instances of pulsating apexes. In addition, maintaining rule #4 as a minimum standard, I scored other apexes which lasted less than 10 fields (but more than 4 fields) if they were "smooth" (i.e. maintained the same intensity level without variation in degree).

(c) I decided to try to consistently score 'actual' locations of AUs regardless of when they met the "minimal requirements" for scoring that are specified in FACS.

(d) Noting the problem with AU 5 in Event 30 (I was Coder A), I reviewed all of the procedures for scoring this AU to try to correct any errors in my judgment. Secondly, since I often did not feel confident in scoring the apex (as opposed to AU onset/offset) of AU 5, I decided not to make any distinction between presence of and apex of AU 5 when interpreting the results of my data analysis.

2.1.3 Reliability test: intensity

As noted in section 2.1, FACS requires the coding of intensity level for only 5 of the 44 facial AUs. However, to respond to the questions raised in Chapters II and III, the intensity level of all AUs needed to be scored. For example, Hypothesis 5 predicts that "facial actions which serve linguistic functions will, at apex, reach a 'Y' or 'Z' intensity level in order to emit a clear visual

signal". Or, noting that a brow raise (AUs 1+2) seems to be a component of several different syntactic signals, one could ask if there are any differences in the intensity levels of the brow raises in these signals.

In order to make any claims about significant differences in intensity levels, one must, of course, be able to reliably distinguish these levels. The reliability test described in section 2.1.1 reported an unsatisfactory level of agreement (.55) for the intensity scores of the whole group (6 coders)—but noted that about half of these "disagreements" occurred when a coder forgot to score the intensity of one of the five AUs which required it.

To determine whether intensity level could be reliably scored for all facial AUs, I conducted another test using the same 6.3 second sample of M1's facial behavior¹ and a 3.4 second sample of F1, similarly chosen for the variety of linguistic structures within the segment (i.e. two wh questions, three yes-no questions, one negated question). For this test, Coder A and Coder C were given the classification and locations scores for all AUs in the two segments and simply told to record the intensity level of every apex in the segments. (Coder C is a Deaf, native signer, M.J. Bienvenu, who had been learning FACS along with two other members of the Linguistics Research Lab at Gallaudet College.) Thus, this test controlled for both classification and location and

¹As noted in section 2.1.2, due to miscommunication, Coder B did not score the intensities for all AUs in the segment. This is why a second test specifically for measuring the reliability of intensity scores was conducted.

only measured the ability of two coders to agree on the intensity level of each AU at predetermined apex locations.

A total of 43 apexes were scored for intensity (X, Y, Z), 29 in the M1 segment and 14 in the F1 segment. The two coders agreed on the intensity score for 38 of the 43 apexes, yielding a .884 level of agreement. Figure 4.7 shows which AUs were scored in the sample, how many times they were scored, and where the five disagreements occurred.

<u>AU</u>	<u>No. times scored</u>	<u>No. disagreements</u>	<u>Disagreement scores:</u>	
			<u>Coder A</u>	<u>Coder B</u>
1	5	0		
2	3	0		
4	5	1	y	x
5	3	1	x	y
10	1	0		
12	4	1	y	x
14	3	0		
15	5	1	y	x
16	2	0		
17	5	0		
18	5	0		
20	1	1	z	y
32	<u>1</u>	<u>0</u>		
Total	43	5		

Fig. 4.7 Number of intensity scores for each AU and disagreements

Of those 39 apex locations where both coders scored the same level of intensity, 23 were scored at the 'X' level (involving AUs 1, 4, 5, 10, 12, 14, 15, 16, 17, 18, 32), 6 were scored at the 'Y' level (involving AUs 4, 15, 16, 17, 18), and 9 were scored

at the 'Z' level (involving AUs 1, 2, 4, 15). No intensity scores were recorded for AUs 25, 26, 27 which themselves measure degrees of the same movement, nor for AUs 41, 44, and 45 which measure degree, timing, and/or tension of eyelid closure.

As seen in Figure 4.7, the five disagreements in intensity scores occur with five different AUs (i.e. 4, 5, 12, 15, 20) and, thus, do not suggest that the intensity scoring of any particular AU will be less reliable than the scoring of other AUs. However, it is noteworthy that the disagreement with AU 4 occurred in the M1 segment where the apex was pulsating and in combination with AU 1 (see section 2.1.1).

The results of this reliability test on apex intensity scoring show that although FACS only specifies how to distinguish intensity levels for five AUs, the same logic which it uses can be reliably applied to most of the other AUs in the system.

2.1.4 Coding of facial data

Finding that FACS can be used reliably to code facial actions during discourse in ASL and that the onset/offset and apex locations as well as apex intensity can be reliably scored, I then used these measures to code the 40 speaker segments described in section 1.4. These segments include a ten-second segment with five speaking turns where the continuous facial behavior of both signers was recorded to observe differences in speaker/addressee behaviors.

Figure 4.8 shows the coding sheet used to record the facial behavior in each segment. The resultant numerical scores (for AUs

and locations) and alphabetical scores (for intensity level) were then converted via computer program¹ into timelines. A sample of these timelines is shown in Figure 4.9.

On the timeline, the facial action units are listed in the left-most column. The time units marked across the page (and numbered every ten units) correspond to 1 videofield each or 1/60th second.

Three dots appearing before a symbol (e.g. before 'Y' in AU 12, or before the asterisk in AU 44) mean that that AU was present at the time the coding was begun. Three dots appearing after a symbol (e.g. after the last symbol in the row marked AU 15) mean that AU was still present at the time coding was stopped.

In each row (which corresponds to activity of the AU listed on the left), the symbols 'X, Y, Z' mark both the apex of an AU and indicate its intensity level. For example, the apex of AU 1 continues from videofield 133641 to 133645 and is at the 'Y' level.

The '<' symbol means the AU is increasing in intensity during the videofields which it marks; the '>' symbol means the AU is decreasing in intensity during the period it marks. So, for example, AU 1 begins at videofield 133636, reaches apex at field 133641, begins to decrease at field 133646 and is no longer present at field 133651.

¹Chi Lee, a computer programmer in the Gallaudet Research Institute, developed the program for converting the data into such timelines, with the generous assistance of Dr. Wallace Friesen.

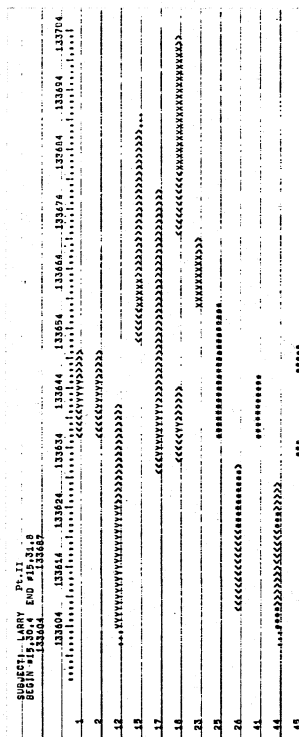


Fig. 4.9 Example of timeline display of facial behaviors

An asterisk is used in two ways: (a) it simply indicates that an AU was present during the time period it marks (e.g. that AUs 25 and 41 were present, both beginning at videofield 133636), or (b) it marks the apex of an AU without specifying its intensity level (e.g. see AUs 26 and 44).

The time line, thus, enables observation of which AUs co-occur within the segment and the exact form of this co-occurrence—e.g. begin at same time, or begin apex at same time, or begin as other AU reaches apex, etc.

2.2 The eyes

The system I used for coding eye gaze is very simple. It codes for (a) the period during which the speaker is gazing at the addressee's face ('+' gaze), (b) the period during which the speaker is not gazing at the addressee's face ('-' gaze), and (c) the location of the speaker's gaze when not on the addressee's face.

This location is abbreviated—e.g. rt; lf; lf,down; rt.hand—next to the minus symbol, which indicates when the '-' gaze began on the timeline. Each location is marked from the speaker's perspective—e.g. a location to the right of the speaker is 'rt'; a location to the left of the speaker is 'lf'; 'rt.hand' is the speaker's right hand. An example of this is shown in Figure 4.10.

Although these distinctions appear to be ambiguous (e.g. exactly where on the speaker's right?), they seemed adequate for

coding the ASL data. In general, each location becomes interpretable only in the context of the discourse in which it appears; that is, the concomitant manual and nonmanual behaviors as well as the linguistic behavior preceding the segment. For example, if a referent has been established in a particular spatial location to the speaker's right, then '(-)rt' in conjunction with a pronominal reference to the right becomes easily interpretable.

Of course, not all locations of '-' eye gaze are linguistic in the sense of being part of a pronominal reference or direct address. Some seem to reflect the speaker's need to not look at the addressee while trying to remember something or to encode a complex thought. Others seem to be influenced by the turn-taking system and, for example, the control of the 'floor' that can usually be maintained by "withholding" positive eye gaze toward the addressee.

However, I have not encountered in the data any examples where either the context did not specify more exactly the location and/or meaning of the '-' gaze or where greater specificity in the coding system was needed to distinguish meaningful differences within an otherwise ambiguous category (like 'rt').

2.3 The torso and the head

Unlike FACS but like the procedures for coding eye gaze, the system I developed for coding head/torso movements and positions is based on what I observed in the ASL data. Thus, the distinctions I make do not enumerate all of the movements which these body parts are capable of making, but only those which

I observed in the 40 segments.

2.3.1 The torso

The system for coding movements/positions of the torso (also called "body") is very simple, basically discriminating 4 types of movements. Each of them is illustrated in the Transcription Conventions section. Two of the movements involve either a movement forward (toward the addressee) or to the side while keeping the body facing the addressee.

(1) 'lean forward'

(2) 'lean rt' (or 'lean lf' - but did not occur in data)

The other two movements involve turning the torso away from the addressee so that it faces a location on the right or left of the signer.

(3) 'face rt' (or 'face lf' - but did not occur in data)

(4) 'shift into rt' (or 'shift into lf' - but did not occur in data)

'Face rt' means that the torso turns to face a location on the right. However, 'shift into rt' means that the body leans to the right and, at the same time, turns to the left, thus facing a location on the left. This movement happens in direct address (see section II.6.2) where, for example, the locations to the signer's right and left may represent two characters and the signer then 'shifts into' one location (i.e. becomes that character) and looks toward the other location while addressing the other character.

These four types account for all of the movements of the

torso that I observed¹ in the data--with the exception of adaptor-type movements such as shifting one's weight from one foot to the other. Although these latter movements did not seem to be a part of any linguistic signal, they did, however, seem to be rhythmically tied to the discourse in terms of both their location in the discourse (e.g. at 'idea boundaries') and their duration. Some of these movements are also described on the data timelines.

Torso movements, since they are relatively infrequent, are usually coded on the same line (in the timelines) as head movements. On this line, marked "Head/Body", all movements are head movements unless preceded by the word "torso" or "body". Occasionally a separate line is used (for the torso) to keep the coding visually clear when both the head and torso are involved in complex actions at the same time. The conventions used to code various locations within a torso movement are the same as those used to code head movements; these will be described and illustrated in the next section.

2.3.2 The head

The system I developed for coding head movements is more complex because the head can move in so many different ways and because signers move their heads relatively frequently and employ many different types of movements. However, the system

¹However, I should add that since I did not focus as much on torso movements as I did on other behaviors, it is certainly possible that I missed recording or distinguishing movements which, in fact, are linguistically significant.

is also fairly primitive since the development of an even more precise form of coding (which is clearly needed for those who wish to focus on this aspect of ASL) would have necessitated considerably more time and energy than I had to devote to this area. For example, the system does not objectively discriminate size, speed, or intensity of movement. This makes it especially weak in measuring (with other than subjective terms like "rapid" or "tense") types of headnodding. Its strengths lie in its discriminations of locations within each head movement and its classification of the types of head orientation or position which appeared in the data.

Each type of head position is illustrated in the Transcription Conventions section. These positions are the result of a particular type of movement (e.g. 'turn' or 'tilt') in a particular direction (e.g. 'right' or 'downward'). These movements are described as:

- (1) 'turn rt' or 'turn lf'
- (2) 'tilt rt' or 'tilt lf'
- (3) 'tilt downward'
- (4) 'tilt back(ward)'
- (5) 'tilt forward' (also called 'jut forward')
- (6) 'chin jut forward' (always in context of 'tilt forward')
- (7) 'retract back'

Several of these movements can co-occur with other movements. For example, 'tilt forward' frequently co-occurs with 'tilt downward' in yes-no questions; 'turn lf' co-occurs with 'tilt downward' in the example in Figure 4.10--which appears during a direct address, yes-no question.

Four other terms which distinguish movements on the time lines are:

(a) 'nod' - in unmarked form, refers to a downward movement of the head followed by a return to its former position. The nod may be preceded by a slight movement backward; when this occurs, it is indicated with arrows in the following way:

(unmarked nod: ↓↑)

nod preceded by backward movement: ↑↓↑

Similarly, the nod may consist of backward movement of the head followed by a return to its former position. This type of nod is written as 'backward nod' and diagrammed as:

backward nod: ↑↓

(b) 'nodding' - in unmarked form, refers to a repetition of 'nod'. The number of "beats" or "strokes" is often written next to the term (e.g. '4 beats'). Each beat or stroke is one full movement in one direction; so, for example, a regular 'nod' has 2 'beats'.¹ Sometimes the location of each beat (in time) is recorded on the timeline, writing in parenthesis the position of the head at the completion of that beat (e.g. up, down). A repetition of 'backward nod' is written as 'backward nodding'.

(c) 'headshake' - refers to a turning movement of the head

¹ I have tried to distinguish beats or strokes in the way Supalla and Newport (1978:94-95) distinguish "primary" movements in signs as opposed to "transition" movements.

to one side, followed by a return to its former position. The turning movement may be preceded by a slight turn in the opposite direction (which is not considered a 'beat').

(d) 'headshaking' - refers to a repetition of 'headshake'. The number of beats or strokes is usually written next to the term, and the end location of each turn is often recorded along the timeline (see example in Figure 4.11).

Nods and headshakes can also co-occur with other head movements/positions. For example, the head may be tilted 'forward' during 'headshaking'. Or, the 'nodding' may occur while the head is tilted 'downward' (in which case the head 'returns' to its former downward tilted position after each nod).

Some additional terms are often abbreviated on the timelines for reasons of space: 'sl' for 'slight' (as in a 'sl.tilt backward'); 'sm' for 'small' (as in a 'sm.nod'); 'lg' for 'large' (as in a 'lg.nod'); 'part.' for 'partial' and 'ret.' for 'return' (as in the 'part.ret' of a 'turn lf' which stops at a specified point); 'pos.' for 'position'; 'cntr' for 'center' (as opposed to 'lf' or 'rt', refers to a position in which the head is directly facing the addressee). Another term is 'neutral' which here, as the unmarked position of the head, refers to a relaxed position directly facing the addressee, absent any movement.

2.3.3 Coding locations of head/body movements

Each movement of the head/torso obviously has a beginning and an end (like the onset and offset of AUs). In addition, some

movements have a 'hold' (like the AU apex) whose duration can be measured.

For example, looking at the timeline in Figure 4.10, the head movement 'turn lf' begins at videofield 6013 (marked by a slash at 6013 on the lines above and below the words 'Begin turn lf'). The head continues turning to the left (shown with the arrow) until videofield 6026. Now the head has moved as far to the left as it will go (in this event), so this is the beginning of its apex. This apex is held from field 6026 to 6084; then the head begins returning to its former position (presumably 'neutral') and arrives there at videofield 6129.

Notice that at the apex onset of 'turn lf', the head began to tilt 'downward'. This second movement reached apex at 6032 and then began its return and ended at the same time as 'turn lf'.

Looking at the "Body" line, we see that the body began a 'shift into rt' at field 6012, one field before the onset of 'turn lf'. The 'shift into rt' reached apex at 6028 and held its apex until 6041. Then it slowly began to return to its former position (presumably 'neutral') and ended at 6079.

Looking at the "Eye Gaze" line, we see that the speaker was looking at the addressee at the beginning of the segment but then looked away at 6014 to a location on the left. Gaze to the left continued until 6121 when the speaker again gazed at the addressee's face. (However, at field 6086, the gaze moved to a place 'less left' than its location from 6014 to 6085.)

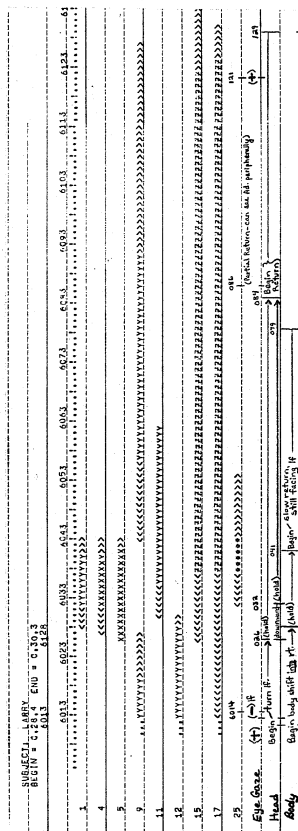


Fig. 4.10 Example of timeline display of nonmanual behaviors (A)

The timeline in Figure 4.11 illustrates the coding of head nodding and shaking. In this segment, a 'nod' begins at videofield (13)044. The head reaches its most fully downward position (that will occur during this nod) at 056 and holds this position until 061. Then the head begins to return to its former position, reaching that position at 071. The movement 'nodding' occurs during the period between videofields 100 and 115. This movement here consists of 3 beats--downward, upward, downward. At videofield 118, the movement 'headshaking' begins and then ends at 158. This movement has 4 beats--to the right (apex at 127), to the left (136), to the right (142), and back to its former position (158). The speaker maintains eye gaze on the addressee's face during the entire segment. No torso movements were observed during the segment.

2.4 The hands and arms

2.4.1 Signs

For each segment, all linguistic behaviors of the hands and arms (of both speaker and addressee) were transcribed following the conventions stated in Baker & Cokely (1980). These can be found in the beginning of the Transcription Conventions section.

In general, these conventions specify that signs are recorded by means of English words (written in capital letters) which attempt to indicate the meaning of the sign. The English word or words (joined by hyphens) then serves as a gloss for the sign.

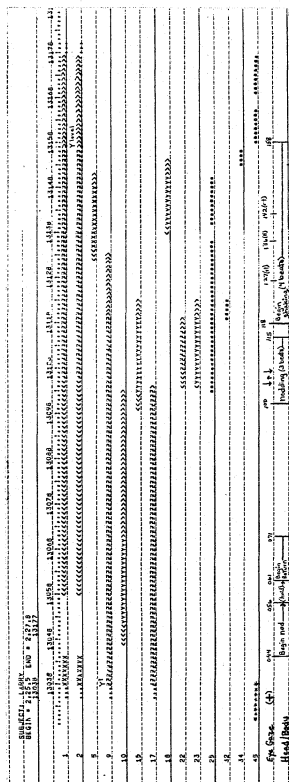


Fig. 4.11 Example of timeline display of nonmanual behaviors (B)

However, such glosses are only approximate translations of the sign's meaning and obviously do not reflect all possible uses of the sign.

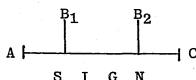
2.4.2 Regulators

As much as possible, all movements and positions of the speaker's and addressee's hands and arms which appeared to serve regulatory functions were also recorded, following the distinctions and terminology of Baker (1977). These specify the occurrence and location of quarter, half, and full rest positions for each hand ('rt' and 'lf') as well as movements toward initiation, continuation, or termination of the speaking turn.

2.4.3 Location scoring

2.4.3.1 Guidelines

The temporal locations of each speaker/addressee sign or regulator were recorded (for transfer onto the timelines) according to the following guidelines:



Score: the first videofield in which the (first, dominant hand) handshape of that sign is fully formed (point A)

the last videofield in which the (last, dominant hand) handshape of that sign is fully formed (point C)

If the sign contacts the body (as in the sign ME) or other hand (as in the sign STOP) score the first videofield of the fully formed contact (point B_1). If the sign has more than one contact (as in the sign DEAF), score both contacts (points B_1 and B_2). If the sign is held in a position for 4 or more videofields, score the beginning and end videofields in that period (B_1 - B_2 , as might occur in EXAGGERATE; or C_1 - C_2 , as might occur in YOU).

2.4.3.2 Rationale

For every sign, one can specify a handshape(s), movement(s), and location(s) (Stokoe 1960). Slow motion observation of video recordings of signing clearly shows that whereas the primary movement of most signs does not generally begin until the hand(s) have reached their specified (first) location, the signer does begin to form the sign's handshape 'enroute' to that first location. This handshape is, in general, fully formed before initiation of the primary movement and remains intact throughout the movement. Thus, scoring the locations of first and last videofields of the sign's fully-formed handshape will give a more exaggerated measure of the sign's duration than would be obtained by scoring only the period during which all three aspects of the sign are present.

I have chosen to use this slightly inflated measure of the sign's duration for two reasons. First of all, one can learn to score reliably the presence/absence of a fully-formed handshape on slow motion video recordings. Bienvenu (Coder C in 2.1.3) and I independently scored five of the 40 segments, according to the

guidelines written above, and, through practice, were able to achieve a high level of agreement for scoring sign onset and offset (average disagreement = 1.7 fields; range of disagreement = 1-4 fields). Secondly, as stated in Hypothesis 3, I suspect that facial signals appear before the manual signs and, in this way, inform the addressee of 'what's going to happen next'. If I find that facial (and other nonmanual) signals appear before even this inflated measure of the manual sign, then my evidence is stronger.

2.4.4 Transcription on timelines

Glosses for signs (and descriptions of other manual behaviors) are written on the timeline in the row marked "Hands". In the simplest case, the beginning and end of the sign (points A and C in 2.4.3) are marked with vertical lines and the gloss for the sign is written inbetween these lines. For example, in Figure 4.12, the vertical line (in the "Hands" row) at videofield 133635 marks the beginning of the sign COLOR; the line at 133656 marks the end of the sign. (The horizontal lines on either side of the gloss COLOR are simply used to help make the duration of the sign visually clear on the timeline.) So in this segment, there are four signs: SAME-arc-rt-lf, COLOR, DIFFERENT, and BLUE.

When a final hold has been scored for a sign, this is indicated graphically with a broken vertical line which marks the beginning of the hold. The end of the sign (and hold) is shown with an unbroken vertical line. For example, in Figure 4.13, the sign glossed as AWFUL is made on the signer's lap and

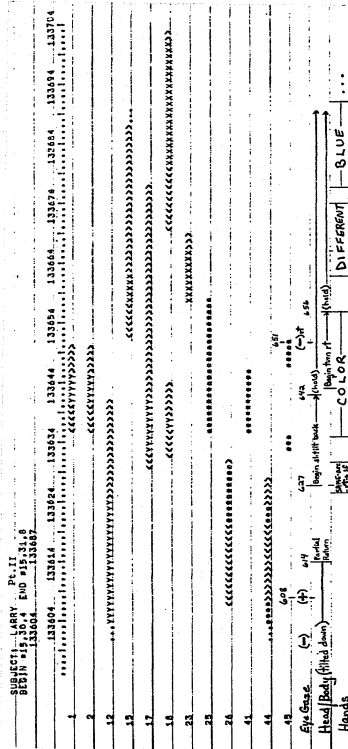
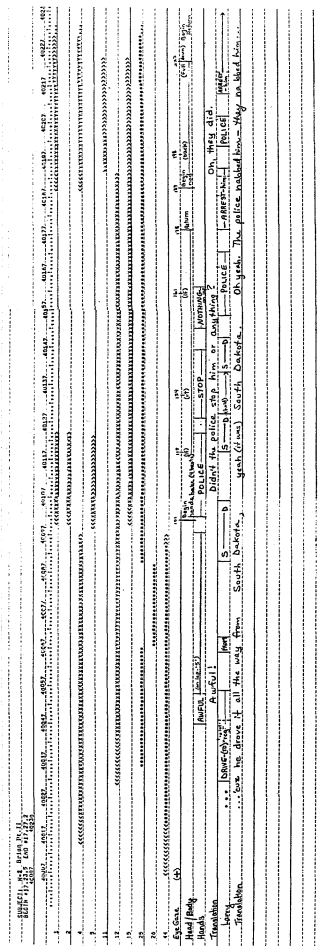


Fig. 4.12 Example of timeline display of manual glosses



is held from videofield 40055 to 40098. Larry's sign DRIVE-(TO)"regularly" is held from videofield 40048 to 40056. (Figure 4.13 also shows the translations, which will be described in the next section.)

The other measures coded, such as location of first full contact, are not systematically shown on the timeline (so as not to overload the visual display), but are referred to during various parts of the analysis.

2.4.5 Contexts and translations

For each segment, a context and English translation was provided by a hearing English/ASL bilingual (who holds a Master Comprehensive Skills Certificate from the Registry of Interpreters for the Deaf) and later verified or modified by a Deaf, native ASL/English bilingual. I was party to each step to make sure I understood as thoroughly as possible the meaning of the segments.

The "context" provided for each segment includes all of the information from the dialogue preceding and following the segment which is necessary for understanding the behaviors within the segment. For example, the context preceding the segment shown in Figure 4.13 includes the information that Larry has been describing an accident: A friend borrowed Larry's car (Larry lives in the Washington, D.C. area) and drove way out to the north central part of the U.S. The friend then ran into something, causing the car to flip over and bashing in the roof and front of the car; the car was a wreck with dents everywhere. Larry says "I told him he was crazy 'cuz he...". The data segment then

begins with Larry's continuation "drove it all the way from South Dakota".¹

The translations provided for each segment (and written on the timelines under the corresponding sign glosses) attempt to reflect both the register and style of the speaker as well as, where possible, the structure of the ASL utterance. Information which is not given in the ASL utterance, but is known from the context and is necessary for the English translation, is written in brackets.

When the addressee does something during the segment, those manual (and where possible space-wise, some nonmanual) behaviors are transcribed on the row marked with his/her name, below the speaker's translation line. Since the timeline only shows the full recording of the speaker's nonmanual behavior, sometimes information appears in the translation of the addressee's utterance which cannot be accounted for in terms of the manual behaviors transcribed. The reader should then assume that the addressee's observed non-manual behavior is the reason for such discrepancies. For example, in Figure 4.12, the translation of Larry's response to Brian's question begins with "Oh yeah". This is because Larry nodded his head and then signed POLICE ARREST-him...

¹ Sometimes providing adequate contextual information meant going back quite far in the tape to find, for example, what facts might have been shared previously, thus warranting the topicalization of that material when mentioned again in the later segment. For this and other discourse-related reasons, I recommend that future studies of this nature focus on continuous, long chunks of data rather than the many, short segments as I have done.

2.5 Comment on time consumption

The coding procedures described above were, obviously, very time-consuming. For the most part working with 1/2" black-and-white videotape on a Panasonic NV 3160 (which has slow motion and stop functions for forward movement), the full coding took approximately 6.25 hours per 1 second of discourse data. Slightly under half of that time was spent on the transcription of facial behavior.

Toward the end of the coding period, I transferred the facial close-up tapes onto 3/4" cassettes in order to use a JVC video recorder (model CR-6650U) with a new remote control unit (model RM-70U) which makes possible forward and backward slow motion and full stop with minimal visual noise distortion. This reduced the coding time considerably (by at least 1/3) because it made all of the behaviors actually 'easier to see' and cut out the time-consuming need to rewind the tape and re-find the segment after each viewing. Consequently, it also reduced the frustrations and tensions which naturally co-occur with this kind of coding.

Chapter V

OBSERVATIONS AND ANALYSES

In this chapter, I will present the results of a variety of analyses of the 40 segments and the methods used to obtain those results. The primary focus is questions: simple yes-no questions, wh questions, and rhetorical questions. The results of each analysis are then reviewed in connection with the hypotheses outlined in Chapter III.

1.0 Subject of analysis: questions

The two major types of questions, yes-no and wh, are distinguished because they ask for different kinds of information and because the forms/structures used to express them are different in most languages. Rhetorical questions do not ask for information, but provide a way for the Speaker¹ to introduce and draw attention to the information which s/he will then supply. These self-directed questions can spotlight the same kinds of information targeted with yes-no or wh questions; hence they may share some of the formal characteristics of these question types. However, they also need to differ in some salient manner so that the

¹In this chapter, the terms Speaker and Addressee will be capitalized in order to highlight these different roles in the system of turn-taking.

Addressee will know s/he is not expected to respond to the rhetorical question.¹

2.0 Selection of data for analysis

As mentioned in Chapter IV, the 40 Speaker segments coded were found to include approximately 65 questions (as well as about 40 statements). These questions were identified by: (a) reference to their corresponding English translation, (b) observation of what happened after the question was asked (i.e. Did a response statement follow the question? If so, what was the nature of the response, and who authored the response?), (c) verification by a Deaf, native signer.

Of those 65 questions, 44 were included in the primary analysis. Approximately 18 of the remaining questions were eliminated from this analysis because they are yes-no questions which contain either headshaking (associated with negation) or head-nodding (associated with assertion, etc.). These were withheld for a later stage in the analysis in which the phenomenon of co-occurring grammatical signals can be explored. A few other questions were eliminated from the primary analysis because they seem to function differently from the three basic question types. For example, one of them is a self-targeted wh question, uttered with obvious self disgust and frustration while gazing downward

¹For example, in English, rhetorical questions which ask wh questions appear with the same lexical choice and word order as addressee-directed wh questions; however, they differ in intonation contour.

and to one side ('Oh, what the heck do you call that?'). Another one looks like a wh question, but seems to function like a statement ('I wonder where do they get the money?'), manually signed as WHERE MONEY with eyegaze to one side until the end of the utterance when the other interactant responds 'Yeah, those deaf guys are rich!'. These examples were eliminated in order to focus as much as possible, on simple, clear instances of each question category.

Of the 44 questions included in the primary analysis, 16 are yes-no questions, 13 are wh questions, and 15 are rhetorical questions. The segments in which these questions occur are listed in Figure 5.0.

yes-no Qs	wh Qs	rhetorical Qs
(W) 0.44.1-0.46.8	(L) 9.08.2-9.21.2	(B) 2.33.0-2.37.7
(W) 1.01.3-1.11.9 (2)	(L) 12.42.5-12.47.0	(B) 5.50.9-5.53.3
(W) 9.03.1-9.06.5 (2)	(L) 13.22.3-13.25.5	(B) 9.08.2-9.21.1 (2)
(L) 0.28.4-0.30.3	(L) 14.50.1-14.54.0	(B) 11.17.0-11.20.3
(L) 2.12.2-2.14.8 (2)	(L) II 2.25.6-2.35.7	(B) II 0.43.4-0.47.2 (2)
(L) 2.25.5-2.27.8	(B) II 4.57.2-5.00.7	(B) II 1.01.2-1.05.1
(L) 8.02.6-8.03.7	(W) 1.01.3-1.11.9	(W) 7.49.3-7.51.6
(L) 9.08.2-9.21.2	(W) 1.20.3-1.21.6	(W) 14.41.8-14.47.3
(L) 14.50.1-14.54.0	(W) 9.03.1-9.06.5 (2)	(L) 0.16.2-0.17.6
(L) II 2.25.6-2.35.7	(C) 3.20.2-3.22.3	(L) 5.58.9-6.02.6
(B) 2.33.0-2.37.7	(C) 5.07.8-5.11.4	(L) 7.30.2-7.36.5
(B) II 4.57.2-5.00.7	(C) 9.34.3-9.35.7	(L) II 5.02.0-5.06.9
(B) II 11.46.9-11.49.3		(L) II 19.06.0-19.09.7

Fig. 5.0 Segments containing the 44 questions

Note: Initial letter in parentheses identifies name of signer: W=Wanda, L=Larry, B=Brian, C=Cinnie. The number '2' written in parentheses after a segment means the segment contains two examples of that question type which were used in the analysis. The roman numeral 'II' corresponds to data taken from the second half of the videotape (during which time the signers were seated).

3.0 Manual behaviors in data: general description

As shown in Figure 5.1, a large proportion (almost 50%) of the wh and rhetorical questions are made with only one sign. Hence, the average length (no. of manual signs) of these questions is slightly shorter than the average length of the yes-no questions.¹

		No. of signs	1	2	3	4	5	6	Average	Range
Question Type	yes-no (N=16)	2	5	3	4	1	1		3.0	1-6
	wh (N=13)	6	1	3	3	0	0		2.2	1-4
	rhet (N=15)	7	4	2	1	0	1		2.1	1-6

Fig. 5.1 Number of manual signs in each question

¹To my knowledge, there are no standard criteria available for counting manual signs. I have used the following guidelines: Count as one — (a) each, unmodulated or base sign, (b) each complete repetition of a sign that functions as a noun or adverb/ adjective, and (c) the modulation of a verb (e.g. WORK "regularly" = one base sign + one modulation = 2). Count as two — a compound/contraction which still has two separate handshapes (e.g. TRUE WORK or NOT HERE, but not REMEMBER [KNOW CONTINUE] or HOME [EAT BED] — which are counted as 1). The other problem encountered when counting signs concerns determining the beginning and end boundaries of the utterance. In discourse, these boundaries become surprisingly fuzzy (especially in the case of initial and final pronominal reference) since the nonmanual signals are not necessarily "co-terminous" in the ways found in elicitation data. This difference is discussed later in section 8.0.

3.1 Lexical question markers

A wh-word sign occurs in 10 of the 13 wh questions. In 5 of those 10 instances, the wh-word sign constitutes the entire question (WHERE, HOW, "WHAT" (twice), #WHAT). In the other 5 instances, the wh-word sign occurs in final position twice and in initial position once (WHERE LIVE L-O-P-E-Z), and the pronoun YOU occurs in final position twice (WHEN YOU; WITH WHO YOU). Thus, these examples fit the general description found in Chapter 11 (7.2) of the lexical portion of wh questions.

A wh-word sign occurs in 11 of the 15 rhetorical questions. In 6 of those 11 instances, the wh-word sign constitutes the entire question (WHY (thrice), WHYwg (twice), REASON). In the other 5 instances, the wh-word sign occurs in final position in three of the questions; the other two questions are ordered ME START HOW PRINT and #WHO [DEAF #WHO] (2h)5-CL'take in'.¹ Three of the 15 rhetorical questions ask yes-no questions: (translated as) 'Is that true?'; 'Would they accept me in the Education department?'; and 'Can deaf people really lipread that easily?'. Thus, these examples also fit the general description provided in Chapter 11 (7.3) of the lexical portion of rhetorical questions.

¹ Analysis of the nonmanual behavior of the latter rhetorical question indicates that the medial [DEAF #WHO] segment is not, in terms of form, a part of the question.

Whereas repetition of one or more signs occurs in none of the rhetorical questions and in only one of the wh questions, it occurs in 8 of the 16 yes-no questions (e.g. HAVE SAME-AS YOUR SAME-AS; INDEX-If PRACTICE (2h)alt.PASS PRACTICE). As a rule, in questions with such repetition, the second instance of the sign has a longer duration than the first instance. This second instance is always in final position or before a final YOU. Three of the 16 questions end with the pronoun YOU (held longer than usual) and one with a sign that lexically marks the utterance as a question (QMwg)—which is the only instance of such lexical marking in the sample. These findings conform to the general observation that the final portion of a question is sometimes "stretched out" in time by various means, as noted in Chapter II (7.1). Other evidence of this lengthening tendency across both yes-no and wh questions can be found by comparing the average duration of sentence-final signs in such questions with the average duration of the last sign in rhetorical questions -- which for both types of questions in my data, revealed a duration at least twice that found in the rhetorical questions.

3.2 Addressee overlap

However, contrary to the simple logic which assumes that final segments are held to give the Addressee time to respond and to maintain the "smooth flow" of conversation, the examples of yes-no and wh questions studied here show that the Addressee generally begins his/her response before the Speaker has initiated

any kind of prolongation of the final sign. In fact, it is not infrequent that the Addressee begins responding before the Speaker has begun to make the last sign in the question, as seen in the following examples:

(from Brian II 11.46.9)

- (1) Brian: (John Miller) HAVE SAME-AS YOUR SAME-AS
 Larry: rt-SAME-AS-me rt-SAME-AS-me
 B: 'Does John Miller have a motorcycle like yours?'
 L: Yeah, like mine.'

(from Larry 14.50.1)

- (2) Larry: WRONG ME YOU
 Brian: ...(cont'd)headshaking+"NO-NO"-----CHARLIE INDEX-1f...
 L: 'Am I wrong?'
 B: 'Unh-uh, Nooooo----- Charlie's been havin' a hard time of it.'

This type of overlap occurs in most (13 out of 16) of the yes-no questions. The Addressee does not respond in the other 3 because either the Speaker continues his/her turn by asking another question or the question occurs in a direct address sequence.

This type of overlap also occurs in 3 of the 13 wh-word questions. On the basis of this data, it's not clear whether the observed difference in the frequency of such overlap between yes-no and wh questions reflects an actual difference in how Addressees respond to these questions or is simply an artifact of idiosyncracies in my data. For example, in 6 of the remaining 10 wh questions, the Addressee does not immediately respond either because the Speaker asks another question or because the Addressee is not sure how to respond. In 2 of the other questions,

the "Addressee" was also engaged in a turn and, thus, did not begin a response until completing his/her turn, as illustrated in the following example:

(from Larry 13.22.3)

(3) Larry: SUDDEN-THOUGHT S-U-I-R PLAY "WHAT"

Brian: "PSHAW" ME EXPECT THAT, lf-INDEX-rt.palm...

L: 'Oh, that reminds me. Suiter's not playing anymore. How come?'

B: 'Shucks! I expected that would happen. Cuz in his right hand...'

These findings of considerable overlap at turn exchange points (especially at the end of yes-no questions) are comparable to those reported by Baker (1977). They are significant here because the behaviors they describe seem to influence Speakers' nonmanual behaviors, as well be discussed in section 8.3 of this chapter.

3.3 Lexical marker: obligatory?

As reported earlier, a wh-word sign is present in the majority of wh and rhetorical questions in this sample. However, 3 of the 13 wh questions do not include a wh-sign (e.g. Cinnie 9.34.3 asks 'What's the title?' with the single sign glossed as QUOTE). So, contrary to the information on the summary chart in Chapter III (Fig. 3.1), wh questions can be formed without the inclusion of a wh-sign.

Similarly, 4 of the 15 rhetorical questions do not include a wh-sign. Three of them ask yes-no questions; the other one asks 'Who's he getting (to be members of the team)?' with the single sign (2h)alt.GET (Brian II 1.01.2). So both types of questions

(yes-no and wh) can be used rhetorically in ASL, and the rhetorical use of wh questions also does not formally require the presence of a wh-sign. Finally, there aren't any lexical question markers which consistently appear in the yes-no questions.

4.0 Nonmanual behaviors in data

In this analysis of nonmanual behavior during questions, the reference point is generally the manual signs which constitute the lexical portion of the question. That is, the manual signs are used to identify a particular period of time. We then logically expect that any actions of the signer's eyes, face, head, and/or torso which mark that utterance as a question will be present immediately before and/or during (some unspecified portion of) that time period.

But there are many different actions which may be present before/during the time period. So how do we distinguish those actions which contribute to the grammatical (question marking) signal from those which may serve other functions? First of all, we need to observe the relative frequencies of each action. Within the bounds of tolerable variation, the language signal presumably has a conventional form which will be present in each instance of that question type. Second, for pragmatic reasons, we expect the location of that signal in time to be fairly predictable (i.e. rule-governed). So we need to observe the relative locations of these frequently occurring actions with respect to the manual signs in each question.

However, it is still conceivable that an action consistently

could be present in a consistent location and yet not be part of the grammatical signal which marks the utterance as a particular type of question. For example, if each wh question in the data had a wh-word sign which occurred in sentence-final position and if each signer mouthed the English gloss -- e.g. 'what, where when, who' -- for that sign, then we would find that AU 18, which puckers or rounds the lips, occurs in every wh question at some point during the final segment in the question. Thus, before deciding the function of each particular AU that occurs systematically, we need to look for alternative explanations for that behavior based on other aspects of the data.

4.1 Lower face behaviors

Applying this type of analysis to actions of the lower face (which here include all actions other than those which affect the brows and upper eyelid), we find that, with the exception of AUs 25 and 26 which simply open the mouth, none of the lower face actions are present (at any point in time) in more than 50% of the examples of any question type. The most frequently occurring lower face AUs (other than AUs 25 and 26) in the three question types are shown in Figure 5.2.

Questions:	YES-NO	WH	RHETORICAL
AU 9	—	38%	—
AU 12	50%	—	—
AU 17	—	—	47%
AU 18	—	33%	40%

Fig. 5.2 Lower face AUs present in $\geq 33\%$ of examples of each question type

Note: AU 9 wrinkles the nose; AU 12 raises the lip corners ('smile'); AU 17 raises the chin boss; and AU 18 puckers/rounds the lips.

The presence of AU 18 in the wh questions and rhetorical is frequently correlated with the presence of a wh-word sign. (Notice that the words 'who, what, when, where,' etc. involve lip-rounding when articulated.) However, this is not always the case. For example, in Wanda 7.49.3, AU 18 is present (at the 'y' level of intensity) during the sign LIPREAD and appears to contribute to the meaning 'easily', which is seen in the English translation (see Baker and Cokely 1980:21). Similarly, AU 17 sometimes is used to close the mouth in conjunction with the (partial) mouthing of a word; however, this explanation can only account for a small proportion of the total number of times it occurs.

Ekman and Friesen (1975) strongly associate AUs 9 and 12 with the expression of emotion (respectively, disgust and happiness). Whereas such an explanation for the appearances of AU 12 in this data is not unreasonable in terms of the contexts in which it appears, the case of AU 9 is less clear. One aspect of the AU 9 movement draws the brows down, resulting in a variant of AU 4 — which, as will be shown later, is a component of the

signal for wh questions. And this (wh questions) is the context in which AU 9 most frequently appears, as seen in Figure 5.2.

One interesting pattern which is visible in 11 of the 15 rhetorical questions concerns the lower-face expression of emotion before and after, but rarely during, the rhetorical. In this sample, the lower face AUs which appear are AU 12 (associated with 'happiness'; occurs in seven examples), AU 14 (associated with 'contempt'; occurs in two examples), and AUs 9 and 10 (both associated with 'disgust'; occurs in one and two examples, respectively).¹ Most often, the same AU occurs before and after the rhetorical (e.g. see the AU 12 surrounding WHY in Brian 11 0.43.4 and Larry 11 5.02.0). However, in some cases, it changes (e.g. see the AU 10 preceding the sign (2h)alt. GET in Brian 11 1.01.2 and the AU 12 in combination with AU 7, after it), or the AU only appears after the rhetorical (e.g. see Wanda 14.41.8 and the AU 14 after her question). This phenomenon is discussed again in section 7.0.

4.2 Upper face, head, and eyegaze behaviors

The chart presented in Chapter III (Fig. 3.1), which summarizes all published observations of nonmanual behaviors during the three question types, predicts the following configurations:

¹The emotion--AU associations are from Ekman and Friesen (1978c) and a recent unpublished list of tentative predictions they made concerning my data.

yes-no Q: AU 1+2+5 + head forward + torso forward + '+' eyegaze
 wh Q: AU 4 + head side tilt + (headshake) + '+' eyegaze
 rhet Q: AU 1+2 + head side tilt + '+' eyegaze

Each of the behaviors listed above has been described as a component of the grammatical signal for that question type. Some of the behaviors in these configurations are said to be present always (e.g. the brow raise in yes-no questions); some are said to be present frequently (e.g. the head tilt to one side in rhetorical questions). Compare these configurations with the results presented in Figure 5.3.

Figure 5.3 reports all actions of the upper face, head, and eyegaze which are present at some time immediately before and/or during (some unspecified portion) of the 44 questions analyzed in this work.¹ It also reports the relative frequencies of each action within each question type. (The percentages usually do not total 100 in each category since more than one behavior may occur within each example.)

Behaviors which are present in more than 50% of the examples of a question type are boxed with solid lines. The two broken-line boxes correspond to behaviors which are present in fewer than 50% of the examples, but which I think are significant as variants within the nonmanual signal of that question type.

¹Two actions of the upperface not reported here are AU 44 (eye squint), which only appeared once in the data, and AU 45 (eyeblick).

QUESTIONS:	YES-NO		WH		RHETORICAL	
	(N=16)		(N=13)		(N=15)	
Upper Face	No.	%	No.	%	No.	%
AU 1	16	100	1	8	15	100
AU 2	15	94	0	0	13	87
AU 4	7	44	13	100	5	33
AU 5	11	69	0	0	5	33
AU 41	0	0	0	0	2	13
Head						
forward*	9	56	3	23	1	7
downward	6	37	2	15	1	7
back	0	0	3	23	8	53
lf/rt	1	6	1	8	5	33
shaking**	3	19	3	23	0	0
nod	0	0	0	0	1	7
retr.back	1	6	1	8	0	0
ret./ ∅	1	6	4	31	2	13
Eye Gaze						
+	15	94	11	85	12	80
-	0	0	0	0	0	0
+ -	0	0	0	0	1	7
- +	0	0	1	8	2	13
+ - +	0	0	1	8	0	0

Fig. 5.3 Frequency of upper face, head, and eyegaze behaviors in 3 types of questions

Note: AUs 1,2,4 correspond to eyebrow movements; AUs 5 and 41 correspond to raising and lowering of the upper eyelid. Under "Head", the last category means the signer's head was returning to neutral position from a previous movement (ret.) or did not move (∅). Under "Eye Gaze", the last category (+-) means the signer was '+' at the beginning of the question, then looked away, and then returned to gaze at the addressee by the end of the question.

* This includes one instance of a torso lean forward during a yes-no question.

** The three instances here of headshaking during yes-no questions are unlike the examples which were eliminated from this primary analysis in order to focus only on simple questions. An explanation of this is found in 4.2.1.1.

In the following 4.2 sections, these emergent patterns of behavior (based on frequency of occurrence) will be presented along with attempts to understand and learn from the exceptions to these patterns. The reader is strongly encouraged to look at the corresponding timelines in Appendix A as they are referred to in these sections, in order to follow the highly detailed observations.

4.2.1 Yes-no questions

4.2.1.1 Upper face

The data summary presented in the yes-no question column (Figure 5.3) has three upperface actions boxed: AUs 1, 2, and 5. AU 1, which raises the inner portion of the eyebrow, is present in every example. AU 2, which raises the outer portion of the eyebrow, is present in all but one example (the direct address question described below). AU 5, which raises the upper eyelid, is present in 11 of the 16 examples.

Assuming, then, that yes-no questions are marked in the upperface with the configuration 1+2+5, this summary provokes two questions: Why doesn't AU 5 appear in five of the examples? And what accounts for the presence of AU 4 (which draws together and lowers the brows) in seven of the examples?

The following tentative explanation of these facts is based on analysis of: (a) the pragmatic function each question, with reference to both the information received prior to the utterance

and the response of the Addressee, (b) the possible occurrence of an utterance preceding or following the question which is identified syntactically with AU 4, and (c) aspects of the question which indicate the presence of emotion, specifically surprise (associated with 1+2+5) or fear and sadness (which include AU 4).

The examples in which exceptions to the 1+2+5 pattern occur are listed in Figure 5.4.

Example	-AU 5	+AU 4
(W) 0.44.1 (#BUT TRUE) MAYBE EXAGGERATE QMwg	X	X
(W) 1.01.3 SHORT+	X	X
(W) 9.03.1 SPEECH TEACH		X
(L) 0.28.4 WORK		X
(L) 2.12.2 FINISH	X	X
(L) 8.02.6 SEE YOU...ny-VERSUS-washington	X	X
(L) II 2.25.6 ACCEPT SIGN-paper FINISH GET	X	
(B) II 11.46.9 HAVE SAME-AS YOUR SAME-AS		X

Fig. 5.4 Yes-no questions without AU 5 and/or with AU 4

This figure shows considerable overlap of those questions absent AU 5 with those questions including AU 4, suggesting some relationship between these two facts.

Looking first at those five examples absent AU 5 in comparison with the other eleven examples with AU 5 present suggests

that two factors -- pragmatic function of the question and the presence of 'surprise' -- are major determinants of the presence/absence of AU 5. What is meant here by pragmatic function of the question is whether or not the Speaker is genuinely asking for information that s/he does not already possess. This can be determined by noting what information the Speaker possesses prior to the question and observing whether or not the Addressee actually responds to that question. The measures of 'surprise' are less precise, but concern the linguistic and social context in which the question occurs and the co-occurrence of behaviors associated with that emotion (e.g. jaw drop open) as well as the corresponding English translation.

A review of all of the examples in relation to these two factors yields the following general rules concerning the presence/absence of AU 5 in yes-no questions:

- (a) If the yes-no question is a 'true' question, AU 5 will be present.
- (b) If the yes-no question is not a 'true' question, AU 5 will not be present -- unless the Speaker expresses 'surprise' with the question, in which case AU 5 will be present (and AUs 1 and 2 will be at the highest, 'z', level of intensity).

The portion of the rules listed above which concern pragmatic function account for three of the five exceptions to the pattern 1+2+5 for yes-no questions. That is, in the example from Wanda 1.01.3, Wanda has previously asked if Cinnie spent a long

time in southern California and Cinnie has responded emphatically 'No!'. Wanda responds to Cinnie's negation with headshaking, 'No?', and then asks the example question 'So it was just a short visit?' (while Cinnie is continuing to express the meaning that she definitely would not stay very long in southern California). Thus, Wanda already knows that, in effect, Cinnie stayed for just a short time. A similar interaction occurs in the example from Larry 2.12.2 (see Fig. 5.4) when he first asks 'Do they still do that?'; Brian says 'No' and begins his explanation as Larry asks 'So it's all over?'. In both examples, the Addressee does not actually respond to the second question, but continues responding to the first ('true') question.

The third example, that of Wanda 0.44.1, is somewhat different. The Speaker has previously described some unhappy observations made by a (non-present) third party concerning the ubiquitous smog in California. Then, almost simultaneously, the Speaker begins to question the validity of the third party's observations as the Addressee clearly confirms those observations. Before the Speaker gets to the question 'maybe he was exaggerating?', the Addressee has already agreed with the third party, saying 'Berkeley's no better (than southern California)' -- which implies the third party was not exaggerating. So Wanda already knows how Cinnie (the Addressee) will respond before she asks her the question. Cinnie, thus, does not actually respond to Wanda's question but simply repeats her conviction that 'Berkeley's no better'.

The motivation for the other two exceptions to the 1+2+5

pattern (i.e. Larry 8.02.6 and Larry II 2.25.6) is less apparent, but some observations of how these examples are different from all of the others may be helpful. Prior to the 8.02.6 segment, the males have been engaging in a rapid, competitive turn-taking exchange focused on the topic of Joe Namath. Immediately before Larry's question, the two take simultaneous turns -- Larry signing 'he gets a million (dollars) easy' while Brian signs 'yeah, all he has to do is drop back and pass'. The final part of Brian's turn then overlaps with the first two signs in Larry's question -- i.e. SEE YOU. Two facts are noteworthy here: (a) that a high intensity AU 9 (which lowers the brows) precedes the question and, thus, may help explain why there is an unexpected AU 4 present during the first two signs and, perhaps, why AU 5 is not present here since the combination 1+4+5 seems to convey an emotion not appropriate in this context (see discussion of the combination on p. 192); (b) that Larry blinks (AU 45) after SEE YOU and then blinks two more times during PAST and WASHINGTON. Such intrasign (and intra-clause) blinking is unusual and likely reflects tension of the Speaker (Baker 1977). It's not apparent what is the source of that tension, but it is understandable that AU 5 will not be present during a period of Speaker blinking (since the two actions are antagonistic).

The final exception to the 1+2+5 pattern (II 2.25.6) is doubly troublesome because the 1+2 is at the highest intensity level ('z') -- which also does not seem to fit the pattern of the other examples in terms of the emotion-related contexts in which such a high

intensity 1+2 normally occurs. (But see discussion of this example in section 5.1.2.) It may be that AU 5 is not present here in order to avoid the combination $1z+2z+5x$, which may signify a state of emotional arousal (i.e. 'surprise') inappropriate for this context. An alternate explanation concerns the fact that the whole, lengthy segment consists of Larry asking for information and Brian either not understanding the questions or, for other reasons, not able to respond readily. As a result, Larry's strategies for getting information may be affected (or may, on the other hand, be responsible for Brian's awkwardness).

Returning to exceptions listed in Figure 5.4, let's now examine those seven questions in which AU 4 is present. In three of these questions (i.e. Wanda 0.44.1 and 1.01.3 and Larry 2.12.2), the AU 4 is clearly associated with a negating headshake that begins before the question and continues during the first part of the question. In these cases, the headshake and AU 4 do not negate any part of the question, but refer to a prior proposition. For example, in Wanda 1.01.3, the AU 4 and headshake begin during the latter part of the sign SUMMER (end of previous question) as a response to Cinnie's negative answer and then continue on into the first part of Wanda's next question (SHORT+).

This type of "self-overlap", made possible by the multi-channel nature of the language, occurs frequently in the data and highlights the importance of recording onset and offset locations for each behavior. For example, suppose several signers are talking about their old clubhouse and one asks if it has been

remodeled or has been left unchanged. If another signer responds by simultaneously making the sign CHANGE while headshaking with a brow squint, the resultant meaning is 'It hasn't changed'. However, if the signer begins the headshake and brow squint noticeably (in real time) before making the sign CHANGE, the resultant meaning is 'No (it's not the same), it has changed'. Thus, the timing of the negation can indicate which proposition is being negated.

In the same way, it is important to consider the location of AU 4 onsets and offsets during the yes-no questions in order to understand its (AU 4's) function(s). For example, in both of the Wanda exceptions cited above, the AU 4 begins 15-25 fields before the question-marking brow raise and ends 37-42 fields before the offset of the brow raise. However, in these examples, the same AU 4 begins only 3-6 fields before the onset of headshaking. Similarly, in the Larry 2.12.1 example, the AU 4 appears 10 fields before the onset of headshaking (the 1+2 is already present due to the previous yes-no question) and then stays on the face long after the offset of the question-marking brow raise. (Recordings of apex locations provide similar evidence and are discussed in later sections.) Thus, for these three examples, the presence of AU 4 is clearly an artifact of the negation preceding the question.

Two of the remaining four examples in which AU 4 is present are alike in that: the AU 4 appears, appropriately, with a grammatical unit prior to the yes-no question, stays on the face during the yes-no question, and then continues on during the

following grammatical unit. That is, in Wanda 9.03.1, AU 4 appears with the wh question HOW, stays on the face during the yes-no question, and then continues on during the following wh question, #WHAT.

Similarly, in Brian II 11.46.9, the AU 4 appears during what looks like a wh question functioning as a topic¹ (notice the head tilt back, and similarities with the wh question in Cinnie 5.07.8 and with the AU 4 and head tilt back in Larry 13.22.3), stays on during the yes-no question, and then continues on the face during the following statement 'He says he wants to keep it because...'.

In the other two examples, the AU 4 generally co-occurs in onset and offset with a particular grammatical unit only -- the question WORK in Larry 0.28.4² and the verb and subject, SEE YOU, in Larry 8.02.6.

It is not readily apparent what is conditioning the presence of AU 4 in these four yes-no questions. Looking at the message content as well as the surrounding syntactic environment suggests several possibilities. For example, we know that AU 4 is associated with negative affect (e.g. anger, fear/alarm), with intense concentration, and in ASL, with negation. My own observations

¹Such an analysis suggests the following English transliteration: 'What about John Miller? Does(n't) he have a motorcycle like yours?'

²For those who are actually 'reading' through the examples: based on the facial and body movement records, I would analyze the first INDEX-1f as an attention-getter (e.g. 'Hey you!') and not part of the question, and analyze the second INDEX-1f as the object of the statement 'I've never seen you'.

(of both hearing and deaf people) suggest that AU 4 also appears when a person suddenly gets an idea (from intense thinking) that s/he feels is important to add, usually immediately, to the conversation.

Looking again at the four questions with these possibilities in mind, the Wanda and Brian examples (containing a 1+2+4+5 combination) begin to appear even more similar. It does not seem to be the case that because AU 4 appropriately appears with grammatical units before and after the question, that it is simply 'assimilated' into (or held during) the question. Other comparable examples in the data do not maintain the AU 4. So, taking the fact that its presence is not incidental but is part of the message, then what does it communicate?

Within Ekman and Friesen's (1978c) list of emotion AU predictions is the combination 1+2+4+5, which is one of their predictions for the emotion 'fear'. As described in their 1975 text, the most common blend with fear is 'surprise' (for which the prediction is 1+2+5+26/27).

Looking at the first two utterances in Wanda 9.03.1, we find some clear evidence, both behaviorally and contextually, for the presence of surprise. Cinnie has been describing a TV program in which a deaf girl is 'miraculously' made able to learn thanks to the efforts of a speech therapist. (Such an event is, of course, contrary to the experience of most deaf people.) Wanda displays her shock by suddenly dropping her jaw wide open (AU 27) and asking a wh question, 'How'd', which she abruptly cuts off. (The surprise 1+2+5 does not appear because it would be ungrammatical

with a wh question.) The surprise is again evidenced by the 'z'-level brow raise during SPEECH TEACH and the presence of AU 5, which as predicted earlier will not appear in infelicitous questions unless surprise is present.¹

Now why the inclusion of AU 4 during SPEECH TEACH? I hypothesize that its presence here adds the meaning 'alarm', or in other words, expresses the speaker's feelings of alarm. However, I would add that it is actually a kind of 'mock alarm' since such mythologies about deaf people are very well known, and because Wanda intermittently displays a slight AU 12 (smile) before and during these utterances -- and then follows them with an AU 10 (upper lip raise), which is one of Ekman and Friesen's predictions for 'disgust'.

Brian II 11.46.9 also shows the combination 1+2+4+5 during the yes-no question HAVE SAME-AS YOUR SAME-AS. Here, there is no contextual evidence of surprise; the brows are at the 'y' (not 'z') level; and AU 5 is present since Brian is asking a felicitous (yes-no) question -- which Larry then responds to.

Why the presence of AU 4? Looking more closely at the context in which the utterance occurs provides some helpful clues. Larry has been talking about his motorcycle and how he has vacillated back and forth between attempting to sell it and deciding to keep it. Why does Brian ask about John Miller's

¹I intend this description to cover cases of exclamations which syntactically take the form of questions.

motorcycle? Because, as Brian tells after Larry's response, Miller has decided to keep his motorcycle because it might become an antique (and hence worth more money). Thus, it is reasonable to hypothesize that Brian is concerned that his friend, Larry, might lose out on a good deal if he sold his motorcycle now (if it is the same as Miller's). It may be that Brian displays this concern by keeping the AU 4 present during the yes-no question -- and by adding a slight AU 11, which deepens the nasalabial furrow and is associated with 'sadness'.

The combination 1+4+5 in Larry 0.28.4 occurs during a yes-no question in a direct address narrative. Here the problem is not only accounting for the presence of AU 4, but also the absence of AU 2.

Again, looking at the context in which the utterance occurs is very helpful. Larry and Brian have been discussing the printing trade, how you need an ITU card (International Typesetters Union) to get a job, and how such cards can be passed around on the sly. Larry says that's how he got started in the business -- by borrowing another deaf guy's card and then being given a job by the shop steward. But, while on the job, the other deaf typesetters kept looking at him skeptically and questioning his legitimacy as an ITU member. Larry's evasive response is 'Oh yeah, I kinda free lance'.

Looking again at the videotape of this segment gives the clear impression that during the question 'You really work here?', the other deaf typesetters are genuinely confused or upset, but that they become more confidently challenging of Larry's presence

with their following statements. So which AUs are responsible for conveying that confusion or upset quality during the sign WORK?

For the emotion 'sadness', Ekman and Friesen offer the predictions 1+4+11+15x, 1+4+15x+17, etc. Looking at the AUs present during WORK, we find 1+4+5+11+15+17. We know that the utterance is a question because of the 1+5. But why no AU 2, as expected? Perhaps it is because the emotion which Larry intends to display here (i.e. a form of 'sadness' which conveys the state of being upset or confused) affects the yes-no question signal. (The characteristic shape of the brows created by a 1+4 would be altered by the addition of AU 2.) Perhaps the compromise effected by combining the emotion display with the linguistic signal is that the emotion display 'suffers' the addition of AU 5, and the linguistic signal 'suffers' the loss of AU 2.

The last example, Larry 8.02.6, was discussed previously on p. 185. I would add here that the short-lived presence of AU 4 may simply be a way of attracting the Addressee's attention ('Hey, I just thought of'), after which it disappears and AU 2 appears to complete the brow raise.

The preceding discussion of how the presence of one or more emotions may affect the facial portion of a linguistic signal is, by necessity, speculative, but does indicate possible strategies for understanding how ASL signers use the face to simultaneously communicate both affective and syntactic information. Returning to the data summary provided in Figure 5.3, the next component of the yes-no question signal concerns movements of the signer's head.

4.2.1.2 Head

In the yes-no question column in Figure 5.3, two behaviors of the head are boxed: tilt forward and tilt downward (boxed with broken lines). The head tilt forward is present in 9 of the 16 questions; the head tilt downward is present in 6 of the 16 questions and co-occurs with the tilt forward in three of these six questions. Tilt forward involves (stretching the neck and) moving the head toward the Addressee; tilt downward involves a pivot movement in which the orientation of the face changes, moving the chin closer to the Speaker's body and the forehead closer to the Addressee.

Three other types of head movement appear in the yes-no question examples: 1 case of left/right movement, 3 cases of headshaking, and 1 case in which the head is retracted backward (the opposite of the tilt forward movement). One other example has no head movement at all.

Looking at each of these exceptions to the pattern of forward/downward head movement, several of them become immediately understandable. The 'turn left' appears in the direct address sequence described in the previous section (Larry 0.28.4). This head movement co-occurs with a body shift into a position to the right of the Speaker, and both movements are part of the device ASL signers use to indicate direct address. However, notice that just before the onset of the sign WORK, the head is also tilted downward for the question.

The three examples in which headshaking occurs were also described in the previous section. In each of these cases (Wanda

0.44.1, 1.01.3 and Larry 2.25.5), the headshaking is part of a negation signal which occurs before the question but which continues on into an initial portion of the question. It is interesting to note that the two examples analyzed previously as not being felicitous questions (Wanda 1.01.3 and Larry 2.25.5) do not include any question-marking head movement.

The case of Wanda 0.44.1 required more explanation (see p. 184), focusing on the timing and implications of Cinnie's response. The conclusion, however, was that Wanda already had received sufficient information from Cinnie to know how she would respond -- hence, no AU 5. So now, if the question is not felicitous, how do we account for the head movement forward and downward?

The last sign in the question, QMwg, which seems to function as a tag-question, provides an important clue. With it, Wanda tries to call forth a positive (agreement) response from Cinnie. But Cinnie holds her position (that 'Berkeley's no better'). So Wanda then gives up trying to get Cinnie to move toward her (Wanda's) position, and simply asserts 'Well, I think Berkeley's much better...'. Thus, if Wanda is trying to use her (infelicitous) question to influence Cinnie's position, then perhaps the head movement toward Cinnie is a way of acting 'as if' and trying to communicate that the third party's statements really are questionable -- 'Don't you agree, Cinnie?'

The last two exceptions to the head forward/downward pattern occur in the same segment, Wanda 9.03.1. The first one involves

the question SPEECH TEACH -- analyzed in the previous section as a surprised exclamation and not a felicitous question. (Notice Cinnie's lack of response and, indeed, movement away from the signing space.) This surprised exclamation occurs without any head movement. However, the visual effect of rapidly moving from a head tilted back position to a fully upright position immediately before the exclamation is striking and gives the impression of being dumbfounded.

The last exception is a felicitous question, 'Only speech?' (notice the AU 5 and Cinnie's response), and occurs with the head retracted back. This head movement, like the one described above, also seems to add to the "dramatic effect" (i.e. she is 'taken aback') and could be viewed as a way of exploiting the language rule (i.e. that the head will move forward/downward during yes-no questions) for that dramatic effect. However, several Deaf signers have observed that the sign FINISH in this semantic context (meaning 'that's all?', 'only that?') not infrequently occurs with the head retracted back. Hence, this exception to the pattern may be a result of both the presence of the sign FINISH and the Speaker's affect and manipulation of the language rules to convey that affect.

4.2.1.3 Eye Gaze

As shown in the yes-no question column in Figure 5.3, all but one of the examples involve continuous eyegaze at the Addressee. The one exception is predictable from the fact that

it occurs in a direct address sequence (Larry 0.28.4). In such narratives, the Speaker 'becomes' different characters via shifts in body, head, and eyegaze positions. In this example, the Speaker gazes to a position to his left (which represents himself) and becomes the deaf printer who asks him 'You really work here?'. Notice that the shift from '+' gaze begins with the shift in head and body position, and that Larry does not return to '+' gaze until right before he becomes himself again.

4.2.1.4 Summary

The preceding sections have argued that the configuration [AU 1+2+5 + head forward/(downward) + '+' eyegaze] constitutes the syntactic signal for simple yes-no questions in ASL. From here on, the symbol 'q' will be used to refer to that configuration.

The preceding sections have also attempted to account for all of the deviations from this configuration in the 16 examples and to see what those exceptions can teach us about other aspects of the language. For example, we saw how the pragmatic function of the question can alter the syntactic signal. Similarly, we saw how the Speaker's emotion can alter or interact with the language signal. We also saw that, in ASL, the relative onset of a behavior is significant for understanding its function whereas its offset appears to be more loosely governed (see section 8.0 for more discussion).

4.2.2 Wh questions

4.2.2.1 Upperface

The data summary presented in the wh question column (Figure 5.3) has only one upperface action boxed: AU 4 (which draws the brows together and/or lowers them). This facial action occurs in all of the 13 wh questions.¹

One example, Larry 12.42.5, has a very low intensity AU 1 occurring at the beginning of the question, during the contraction that means 'next Saturday'. Since time adverbials are generally fronted and topicalized in ASL and since this is the only instance in the data of a time adverbial and of an initial AU 1, it is reasonable to assume the AU 1 is functioning as some sort of topic marker here. However, this raises other questions: Why isn't AU 2 present (as part of the topic marker)? Why is AU 4 present during the topic? Why doesn't the head tilt back during the topic? More data of this nature is needed to explore these questions.

One other example is worth closer examination for what it can tell us about the relative significance of the onset versus offset of the facial signals: Larry 14.50.1. Of interest here is the wh question 'Or what?', followed by the yes-no question 'Am I wrong?'. Notice that the AU 4 precedes the manual portion of

¹The segment Wanda 1.20.3 shows an AU 9, not AU 4. However, since one result of the AU 9 (here at 'y' intensity) is that it pulls the brows down (giving the appearance of Ekman and Friesen's AU 4b), the behavior still fits the pattern although the numerical score is different.

the wh question¹ but goes off the face about half-way through "WHAT". Then, while the hands are still involved in the production of the wh question, the face (and later, the head) begins to signal the coming yes-no question with the 1+2+5 configuration.

This example illustrates the general pattern seen in all of the questions: the (nonmanual) syntactic signal precedes the (manual) lexical signs in time; however, its offset is much more variable and may occur prior to the offset of the lexical string. (This finding is considered in more detail in section 8.0.)

4.2.2.2 Head

As shown in Figure 5.3, there is much variation in the head movements which occur during the wh questions and none seem to occur significantly more frequently than the others. Thus, no prediction is made here for head movement in wh questions.

However, some of the data is partially understandable, especially the examples with headshaking — i.e. Larry 13.22.3 and 14.50.1 and Brian II 4.57.2. Both of the Larry examples are like those discussed earlier: the headshaking negates a preceding proposition (i.e. 'not play'; 'not right') but continues on into a portion of the wh question. The Brian example is curiously different. Here the headshake is very small, lasts only 2 fields, occurs after the sign PLAY, and negates the verb phrase 'playing

¹The one-field behavior immediately before "WHAT", written as 'R?' on the timeline, is here analyzed as part of the wh question and may be the letter 'R' (suggesting an English intrusion — i.e. fingerspelled 'or'). But the behavior was too ephemeral for confident identification.

quarterback'. (Without the headshake, the sentence could mean 'why don't you play quarterback?'.)

As alluded to earlier, the head tilt back which occurs with the wh questions in Brian 11 4.57.2 and Cinnie 5.07.8 may indicate that these questions are functioning as topics. In both cases, the Addressee does not respond and the Speaker immediately continues his/her turn by asking another question to which the Addressee does then respond. (This Addressee 'no response' occurs in only three other instances — two of them in the rapid-fire, mock surprise sequence in Wanda 9.03.1 and the other in Larry 11 2.25.6 in which Brian repeatedly falters as if unsure of what Larry is asking him.) Interestingly, the third instance of a head tilt back in the data occurs with the initial utterance in that rapid-fire, questioning sequence of Wanda 9.03.1.

4.2.2.3 Eye Gaze

As shown in the wh question column in Figure 5.3, all but 2 of the examples (or 85%) involve continuous eyegaze at the Addressee. In the other two examples, the gaze away from the Addressee is brief and is returned by the end of the question. One of these is Larry 9.08.2 where Larry looks at his right hand as he fingerspells 'Theisman'. The other occurs during the first sign in Larry 12.42.5 where the gaze is directed downward and slightly leftward, giving the impression that Larry himself is trying to remember the name of the college which he is asking Brian to recall.

4.2.2.4 Summary

The preceding sections have described the configuration [AU 4 + '+' eye gaze] as the syntactic signal for wh questions in ASL. From here on, the symbol 'wh-q' will be used to refer to that configuration.

4.2.3 Rhetorical questions

4.2.3.1 Upperface

The data summary presented in the rhetorical questions column (Figure 5.3) has two upperface actions boxed: AU 1 and 2. AU 1 occurs in all of the 15 examples; AU 2 occurs in all but two of the examples.

If we assume that rhetorical questions are marked in the upperface with the configuration 1+2, then we must ask: why doesn't AU 2 occur in two of the examples? And what can account for the presence of AU 4 in five of the examples, of AU 5 in five of the examples, and of AU 41 (which droops the upper eyelid) in another two of the examples?

Figure 5.5 shows the distribution of these non-predicted AUs and the resultant upperface configurations which appear in the rhetorical questions. By necessity, AU 5 and AU 41 do not co-occur because they are antagonistic actions — i.e. AU 5 raises the upper eyelid; AU 41 lowers it.

Segment	AU:	+1	+2	+4	+5	+41
(L) 0.16.2		X	X			
(L) II 5.02.0		X	X			
(B) 5.50.9		X	X			
(B) 9.08.2 (2)		X	X			
(B) II 1.01.2		X	X			
(B) II 0.43.4 (2)		X	X			X
(L) II 19.06.0		X	X			X
(W) 7.49.3		X	X		X	
(W) 14.41.8		X	X		X	
(B) II 0.43.4 (1)		X	X		X	
(B) 2.33.0		X	X	X	X	
(B) 9.08.2 (2)		X	X	X	X	
(L) 5.58.9		X	X*	X		
(L) 7.30.2		X		X		
(B) 11.17.0		X		X		

Fig. 5.5 Upper face configurations in rhetorical questions

In Larry II 19.06.0, AU 41 begins with the sign OFF-POINT and ends after the first articulation of DRINK-ALCOHOL. During its latter period, AU 41 co-occurs with AU 19 (extension of the tongue) -- which adds the meaning 'and was really out of it', or, in the context of drinking a lot of alcohol, means that the subject 'got bombed'. As described in Chapter II (section 5.3), this co-occurrence of AU 41 with AU 19 agrees with Baker and Cokely's (1980:19) illustrations of the nonmanual adverb 'th',

*The configuration 1+2+4 does not actually occur in this example. Instead, the brows change from 1+4 to 1+2.

which refers to a state of being unaware, inattentive, out of control. Such reference to the components of 'th' does not explain why AU 41 onsets two signs earlier than AU 19, but does strongly suggest that AU 41 contributes to the semantics of the utterance rather than the syntactic signal of the rhetorical question.

The other instance of AU 41 occurs in the second rhetorical question in Brian II 0.43.4. Beginning with videofield 80172, the left eye is scored as AU 41 and the right eye as AU 42 (eyelid lowered so far that only a 'slit' is visible). At videofield 80211, both eyelids are completely lowered such that the score becomes AU 43 (eyes closed) during the last sign in the statement ('cuz we'll have yellow jerseys') which follows the rhetorical question.

One unusual aspect of this rhetorical question, clearly visible on the timeline, is that the brow raise (which reaches only a bare minimum level for scoring) does not co-occur with the sign WHY, but appears after it. Yet, native signers viewing this segment in real time, still confidently identify it as containing a rhetorical question which consists of the sign WHY. One possible explanation is that the head tilt back, appearing right before WHY is a salient marker which clued the viewers in to the syntactic function of the sign, and they then mentally associated the subsequent brow raise with that sign. However, it is also likely that their perception of WHY as a rhetorical question is influenced by the occurrence of the same sign, clearly marked as a rhetorical question, in the utterances immediately preceding it -- setting up a concatenation of 'why? because...', 'why? because...'.

Returning to the question of what can account for the presence of AU 41 (and 42) during the rhetorical question, looking at all the facts surrounding this utterance suggests that the Speaker has begun to 'turn off' his focus on this utterance and has begun thinking about something else. This hypothesis is supported by three observations: the increasing eyelid closure during the utterance leading to full closure with the head down, the "misplaced" and barely minimal level brow raise, and the y-level brow squint following the utterance, which, in the context of 'eyes closed/head down', gives the impression of intense thinking. The context in which the entire segment appears also supports this analysis: Brian is listing the teams in a new football league. The third mentioned is his team and he adds the information which comprises the 0.43.4-0.47.2 segment. Then he tries to continue with the list to the fourth team, but at first can't remember its name -- which accounts for the 'intense thinking'. Thus, the analysis here suggests that Brian began trying to recall the name of the fourth team during the last portion of his utterance, and that that mental activity affected various aspects of his linguistic, facial behavior.

The next series of questions concerns the unpredicted presence of AU 5 in five of the examples. In two of these examples, AU 4 is also present.

As mentioned in section 3.1, three of the fifteen rhetorical questions ask yes-no questions. These three are among the five in which AU 5 is present. Two of them (i.e. Wanda 7.49.3 and 14.41.8) occur with the configuration 1+2+5; the third

(Brian 9.08.2 - TRUE) also includes AU 4.

There are two, related explanations for the presence of AU 4 in Brian's rhetorical question: (a) that it is part of the negation signal which adds the meaning 'or not' to the question 'Is that true?', and/or (b) that it is part of a series of emotion-related AUs (i.e. AU (1+2)+12 $\rightarrow$ 6 $\rightarrow$ 4+6 $\rightarrow$ 4+6+10) which, in this context, express the Speaker's doubt that the preceding explanation (of the football player's improved performance) is accurate. In either case, the AU is not part of the rhetorical question signal, further evidenced by the fact that it continues on the face after the offset of AUs 1, 2, and 5.

If we assume for the time being that rhetorical questions that ask yes-no questions are marked with the upperface configuration 1+2+5 (instead of 1+2), then what accounts for the presence of AU 5 in the other two rhetorical questions which ask wh questions -- i.e. Brian 11 0.43.4(1) and Brian 2.33.0?

Looking at the location of AU 5 in the 2.33.0 segment, we see that its onset largely coincides with the onset of the sign me-LOOK-AT-rt,cntr; that it is present throughout this sign; and that it offsets as the head tilt back begins for the rhetorical question.¹ This primary co-occurrence with the verb suggests a relationship with the lexical item (rather than the syntactic signal) which the meaning of the verb supports.

¹This complex example is unlike any of the others in the corpus in that it contains a medial segment which receives a different upperface marking (AU 4y). The apex of AU 4 coincides with the sign DEAF and suggests that DEAF (#WHO) constitutes a clause subordinate to #WHO (2h)5-CL'take in', like 'who, of the deaf

Looking at the location of AU 5 in Brian II 0.43.4, we see that it lasts only six fields (1/10 second) and that it overlaps by two fields the rhetorical sign WHY (which is only four fields long). Thus, it could be analyzed as part of the syntactic signal — although I suspect it's simply that "glint in the eye" which accompanies good jokes (notice the y-level smile that precedes it). And if any member of my dissertation committee ever reads this and tells me, I will merrily deliver to him/her a magnum of California's finest and three excellent party jokes.

The other instances of AU 4 occurring in rhetorical questions involve three segments: Larry 5.58.9 and 7.30.2 and Brian 11.17.0. In the latter two segments, AU 2 does not appear during the rhetorical. Again, the possible explanations offered to account for these variations from the predicted pattern focus on the presence of negation and/or emotion (not necessarily "felt").

In the case of Larry 7.30.2, the presence of negation before (and after) the rhetorical WHY may account for the AU 4. That is, Brian has been describing proposals made by football players (e.g. end the reserve clause, increase the minimum wage) who

guys, took in...'. Another question about this example is if it does indeed contain a rhetorical question, as in 'But now I look around at them and see — who are the ones, the deaf guys, who took in all that money? — they're the one's who are completely broke!', or is it a relative clause, as in 'But now when I look at those guys who, the deaf guys who, took in all that money, I see they're all completely broke!'. Liddell's (1977/80) description of restrictive relative clauses in ASL says they appear with a 1+2+10 + head tilt back configuration. Three of these behaviors are present; AU 10 (upper lip raise) is not. Secondly, since wh signs are not used as relative pronouns in ASL, the presence of #WHO in this example would have to be viewed as an English intrusion if the segment were analyzed as including a relative clause.

assume the owners can afford to make these changes. Larry interrupts Brian with the rebuttal '(but the owners) can't', accompanied by a headshake and AU 4, and then begins to explain why the owners can't afford them (despite Brian's efforts to keep the floor — NOW+++).

However, as described earlier, the brow configuration caused by AUs 1+4 is associated with the emotion 'sadness' (Ekman and Friesen 1978c). Abstractly, Larry's message is that something which is desirable is nevertheless not possible because of certain hard realities. This 1+4 configuration (at varying intensities) occurs throughout the segment -- until the change in 'attitude' which begins with the conditional. Thus, it is possible that the 1+4 is like a 'plaintive' or 'distressed' tone of voice whose form can be altered for syntactic purposes, for example, by changes in intensity or by temporary disappearance. Notice that AU 1 goes off the face briefly at the juncture between the rhetorical and the topic (WASHINGTON) and that AU 4 decreases in intensity during this same period.

Similarly, in Brian 11.17.0, the 1+4 configuration is maintained through the rhetorical and following statement. Here the context is a discussion of football injuries -- Larry's, then Brian's, then another guy's last week. Brian's alarm in recalling that guy's physical sensations can be seen in the AU 5 which appears with AU 4, and then also with AU 1 before FEEL "WHAT". His subsequent disgust after his own graphic description is also apparent with the y-level AU 9 (nose wrinkling) which follows the description.

Thus, the hypothesis that the 1+4 configuration connotes 'distress' is also supported by the context in which this example appears. The suggestion made above that the intensity of these AUs may be varied for syntactic purposes also receives support from this example. Note that AU 1 is at the 'y' level when it marks the rhetorical¹, decreases during the juncture between the rhetorical and following statement, and then increases to only 'x' level during the statement where its presence is not syntactically required.

The last example with AU 4, Larry 5.58.9, is interesting because it involves both 1+4 and 1+2. That is, about midway through the rhetorical, REASON, the brows change. It is not apparent to me why this should happen.

Returning to the 1+4 'distress' hypothesis, one finds some contextual support for its application here: Larry has been describing a troubling situation where his father works. There used to be 200 employees where there are now only twenty; those 180 were all laid off due to lack of work. And, in fact, as he tells in the example, the employers want to lay off many more (probably including his father). (Notice the recurring AU 14 --

¹Why doesn't AU 1 continue at 'y' level during the sign "WHAT"? As several other examples show, the manual and the nonmanual are not always perfectly 'in sync', but such "performance errors" (?) do not seem to disrupt the communication. In this example, the focus is on FEEL (chest contact in the sign occurs at video-field 44541 -- which is in the center of the AU 1 apex). Immediately after FEEL, AU 1 decreases. The next sign, (2h)"WHAT", is barely visible, lasting only 1/60th second.

which Ekman and Friesen predict to be a sign of contempt.) However, if we use the 1+4 'distress' hypothesis to understand the brow configuration during the first portion of the rhetorical, we are still unable to explain the shift to the predicted form, 1+2.

One final word about the 1+4 'distress' hypothesis is that review of the contexts in which the other ten no-AU 4 examples appear shows that they are unlike the 'distress' contexts described above. (In fact, six of them have an AU 12 (smile) before and/or after the rhetorical question.) The other two examples with AU 4 in which AU 2 also appears, also do not fit the type of 'distress' context described above. Thus, the 1+4 configuration appears in all those and only those contexts in which topic-related Speaker distress can be identified.

4.2.3.2 Head

The rhetorical questions column in Figure 5.3 has two movements of the head boxed: head tilt back and head tilt/turn to one side (lf/rt)-- which is boxed in broken lines. The head tilt back occurs in 8 of the 15 examples; head movement to one side occurs in 5 of the examples. Together, they account for the total head movement in 10 of the 15 examples.

Within the remaining 5 examples, there is one instance of head move forward, one instance of head tilt downward, one instance of head nod, and two instances where the head is returning from a previous movement or is moving with the body. There are no examples of rhetorical questions in which no head movement occurs.

It turns out that the instances of forward, downward, and nod movements occur during the three rhetorical questions which ask yes-no questions. That is, the forward movement occurs during rt-ACCEPT-me IN E-D in Wanda 14.41.8; the downward movement occurs during DEAF CAN LIPREAD-easily in Wanda 7.49.3; and the nod occurs during the sign TRUE in Brian 9.08.2. Forward and downward head movement were described in section 4.2.1.2 as variant components of 'q'. The nod in tandem with the upperface components of 'q' signals that one is questioning an assertion (Baker 1980b) -- which is, in fact, what Brian is doing to the football player's assertion (that playing with a good team makes him play better).

Remembering that during these three examples AU 5 is present in addition to 1+2, we are led to conclude that at least for these examples the upperface and head behaviors which co-occur with rhetorical questions that ask yes-no questions are the same as those which occur in actual yes-no questions. Similarly, for this set of data, the head and upperface behaviors which co-occur with rhetorical questions which ask yes-no questions appear to be different from those which ask wh questions. That is, they differ in the direction of head movement and in the presence/absence of AU 5.

Both of the remaining two examples can be interpreted as fitting the head back/(side) pattern for rhetorical questions (which ask wh questions) in the following ways: In Larry 11 5.02.0, the sign KISS-FIST, which precedes the rhetorical WHY, involves a tilting movement of the head toward the hand on the right. Thus,

the movement which accompanies WHY involves the same sideways tilting movement in reverse, as the head returns to an upright position.¹ Similarly, in Larry 7.30.2, the head returns from a turn to the right immediately before the rhetorical WHY. However, in addition, the entire body during WHY shifts backward (away from the Addressee) by Larry's shifting his weight to his back foot. Thus, in both cases, some form of sideways or backward movement is present (and 'envelops' the rhetorical in the same manner found with the others -- i.e. begin before and end after).

4.2.3.3 Eye Gaze

As seen in Figure 5.3, 12 (or 80%) of the 15 rhetorical questions involve continuous eye gaze at the Addressee. In two other examples, Larry 9.08.2 and Brian 2.33.0, there is a brief '-' gaze at the beginning of the rhetorical which then changes to '+'. One rhetorical question in the data ends with '-' gaze (Larry II 5.02.0). This is, of course, possible since the rhetorical is not a true question, and no turn exchange is anticipated.

4.2.3.4 Summary

The preceding sections have described the configuration [AU 1+2 + head back/(side) + '+' eye gaze] as the syntactic signal

¹ Furthermore, when asked to reproduce this segment at the same speed but with backward or leftward head movement after the return from the right tilt in KISS-FIST, native signers report an awkwardness or stiltedness in the production and prefer to sign WHY during the return movement from KISS-FIST. Presumably, something about the head movement in KISS-FIST affects the head movement during the rhetorical.

for rhetorical questions. From here on, the symbol 'rhet.q' will be used to refer to that configuration.

The three examples in the data which ask yes-no questions were found to differ from 'rhet.q' and, in fact, to look like 'q' in terms of their components -- i.e. AU 1+2+5 + head forward/(downward) + '+' eye gaze.¹

To account for three instances of a 1+4 brow configuration, a 'distress' hypothesis was proposed based on an analysis of how the conversational topics in these three instances differ from the topics in the other 12 examples. The hypothesis notes that 1+4 is the upperface prediction for the emotion 'sadness' (Ekman and Friesen 1978c) and that some type of Speaker sadness could be reasonably inferred from the contexts in which those three examples occur.

4.2.4 Summary and questions

Noting that contexts arise in which there is no apparent manual signal of the syntactic function of sentences which Addressees then interpret as yes-no questions, wh questions, or rhetorical questions, the preceding (4.2) sections have tried to determine what behaviors of the face, eyes, and head may be occurring in patterned ways to signal the syntactic function of such sentences. The predominant behaviors found within each question type are shown in Figure 5.6, which distinguishes

¹I am assuming that the assertion-related head nod does not constitute a counterexample but conforms to what would be found with a similar yes-no question.

rhetorical questions that ask wh questions from those that ask yes-no questions.

Question Type:	yes-no	wh	rhet(wh)	rhet(y/n)
AU 1+2			+	
AU 1+2+5x	+			+
AU 4		+		
Head forward/(downward)	+			+
Head back/(to side)			+	
(No prediction for head)		(+)		
'+' Eye gaze	+	+	+	+

Fig. 5.6 Predominant behaviors within each question type

This summary chart draws attention to the assumptions stated in Hypothesis 9 (from Chapter III):

Hypothesis 9

Each configuration of nonmanual behaviors which serves a syntactic function can be distinguished from all other configurations of nonmanual behaviors which serve different syntactic functions.

As noted in Figure 5.6, the configuration accompanying yes-no questions differs saliently from that which accompanies rhetorical (wh) questions. The head movements differ and the upper eyelid movements differ. In fact, if the Speaker maintains eye gaze on the Addressee while tilting the head back, the Speaker's eyelids will naturally appear to lower as more of the eye cover fold becomes visible. Thus, the resultant appearance of the upperface during a brow raise with the head tilted back is

visually quite distinct from the appearance created when the brows and upper eyelid are raised with the head tilted forward/downward.



In the same way the configuration of behaviors accompanying the three rhetorical questions in the data which ask yes-no questions differs from the pattern found for rhetorical questions which ask wh questions. That is, the configuration appears to be the same as 'q' -- i.e. 1+2+5 + head forward/(downward) + '+' eye gaze. If true, then is there any visible distinction between actual yes-no questions and those posed rhetorically? This question is addressed in section 6.0, which examines relative onset and offset durations within each question type. Another area for future consideration concerns potential differences in lower face behaviors, for example, the distinct pattern observed in the rhetorical question data (see section 4.1 and 7.0).

As cited in Chapter II, Liddell (1977/80) finds that 'head tilt back' is a component of 't' -- the nonmanual signal for topics; the other component is a brow raise. The analysis of

wh-rhetorical questions here finds these same two behaviors in 'rhet.q'. So are 't' and 'rhet.q' the same? A case can certainly be made that rhetorical questions function pragmatically like topics; both introduce and draw the Addressee's attention to something the Speaker intends to comment on. In section 4.2.2.2, it was suggested that the three wh questions in the data which occur with a head tilt back (but brow squint) may also be functioning as topics. In each case, the Addressee does not respond, and the Speaker immediately continues his/her turn by asking another question (to which the Addressee does then respond). So does the 'head tilt back' itself have morphemic status?

At various points, I have hypothesized that the presence of emotion (felt or otherwise) can affect the occurrence of particular AUs in the syntactic signal and/or affect the intensity level of those AUs. For example, the 'distress' hypothesis in section 4.2.3.1 observes that topic-related Speaker distress can, in a (wh) rhetorical question, change the predicted 1+2 brow configuration to a 1+4 configuration. Or, the hypothesis concerning infelicitous yes-no questions in which Speaker surprise is present says that AU 5 will occur and that the brow raise will be at the 'z' level of intensity.

Similarly, as mentioned above, I have hypothesized that the pragmatic function of a particular (syntactic) type of question can affect the upperface or head behaviors which occur with it. As such, wh questions which may function as topics are found to occur with a head tilt back, and infelicitous yes-no questions generally do not occur with the AU 5 that marks 'true' yes-no

questions.

The information presented in this section enables initial testing of Hypothesis 16, which says:

Hypothesis 16

Combinations of facial actions observed to occur in specific expressions of emotion (e.g. 1+2+5+26 in 'surprise') will not serve as grammatical signals.

Of course, the testing of this hypothesis requires access to a list of those AU combinations which researchers have determined to be signs of particular emotions. The only list presently available is a partial one found in Ekman & Friesen 1978c (pp. 142-143). This list distinguishes "prototypes" from "major variants". For example, the prototypical AU combination of 'surprise' is 1+2+5x+26/27; major variants are 1+2+5x, 1+2+26/27, and 5x+26/27.

Comparison of the AU and AU combinations catalogued in Figure 5.6 as components of the question signals with the lists of AU predictions for the emotions 'surprise', 'fear', 'happiness', 'sadness', 'disgust', and 'anger' reveals that most of the emotion predictions include lower face actions whereas the AUs associated with the question signals are solely upperface actions. Second, of the two emotions (fear and surprise) which list combinations of upperface actions as major variants, only one has a combination which coincides with the facial components of one of the question signals in ASL. That is, a major variant of 'surprise', as listed above, is 1+2+5x — which is also the prediction for felicitous yes-no questions.

Hypothesis 16 was formed with the assumption that the language needs to provide ways of distinguishing linguistic signals

from affect expressions and that one way to do this is to not use the same combinations of facial actions. However, if the description of the effects of Speaker surprise presented in the preceding sections is accurate, then ASL signers use a different device for disambiguating, for example, non-surprised yes-no questions from yes-no questions articulated with surprise -- a change in intensity level. (That such a difference could be salient is partially supported by Ekman & Friesen's listing 1+2+5x as a variant of 'surprise', but 1+2+5z as a variant of 'fear'.)

As more information about the AU combinations in other linguistic signals in ASL becomes available, perhaps we will find a general avoidance of the combinations associated with other emotions. Or, we may again find that such distinctions rely on other behavioral differences within the AU combinations.

Several of the preceding sections also underlined the importance of coding the relative onset and offset locations of each behavior in order to understand its potentially linguistic function. In this way, in many different instances, we were able to explain the presence of non-predicted behaviors -- like AU 4 and head shaking during yes-no questions -- as artifacts of prior events, like the negation of a previous utterance.

In the next several sections, we will examine more closely questions concerning the relative onset/offset locations of facial and head behaviors, differences between the actual duration of such onsets and offsets, and differences in the intensity level of AUs in each configuration.

5.0- Relative apex intensity levels: upper face

As described in Chapter IV, the Facial Action Coding System (FACS) distinguishes three levels of intensity for a given facial action -- i.e. x (low), y (medium), and z (high). Measurement of the intensity level of the upper face actions in 'q', 'wh-q', and 'rhet.q' is one step toward understanding the salience of these grammatical signals. Here what is measured is the intensity level of the AU during its apex.

Figure 5.7 shows the relative intensity level of the brow raise which occurs in the yes-no question examples and rhetorical question examples and the brow squint which occurs in the wh question examples. The numbers under 'q' and 'rhet.q' represent the total number of times either AU 1 or AU 2 is at each intensity level (at apex). Note that the intensity level of these two actions at apex is not always the same; however, when they are not the same, AU 1 is always the greater (in this data). AU 5 is omitted from the analysis of 'q' because it always appears at the 'x' level in the examples.

Signal: Upper face AUs:	q 1+2		rhet.q 1+2		wh-q 4		Total	
	No.	%	No.	%	No.	%		
Intensity level:							No.	%
z	16	52	4	14	2	15	22	30
y	10	32	22	76	8	62	40	55
x	5	16	3	10	3	23	11	15

Fig. 5.7 Apex intensity levels of eyebrow actions in 'q', 'rhet.q', and 'wh-q'

Generally speaking, Figure 5.7 shows two things: (1) that there is a strong tendency toward the medium (y) intensity level in 'rhet.q' and 'wh-q', but a surprisingly high number of z-level actions in 'q', and (2) all three question signals generally use greater-than-x-level brow actions. These findings generally support Hypothesis 5 in chapter III.

Hypothesis 5

Facial actions which serve linguistic functions will, at apex, reach a 'y' (intermediate) or 'z' (peak) intensity level in order to emit a clear visual signal.

That is, of the brow actions in 'q', 84% are at the y/z level; 90% are at the y/z level in 'rhet.q'; and 77% are at the y/z level in 'wh-q'.

However, the findings for AU 5 in 'q' (and in the 'rhet.q' examples) do not support Hypothesis 5 since AU 5 always appears at the 'x' level. As a tentative explanation, I think a greater-than-x-level AU 5 (upper eyelid raise) is too strongly associated with intense emotion (especially fear or anger) for it to appear as part of a non-affect-related syntactic signal.¹ Speaking from a different perspective, the 'bulging' appearance of the eyes created by even an x-level AU 5 also questions whether salience is achieved in the same way (i.e. by increased intensity) for all facial actions.

¹ However, it could also be argued that AU 5 is always affect-related if 'interest' is included under 'affect'. That is, another way of looking at the finding that felicitous yes-no questions are accompanied by AU 5 is to say that when Speakers are interested in the Addressee's response (because they are asking for information they don't already possess), AU 5 will appear.

Noting that not all of the brow actions in the examples of each question type are at the y/z intensity level, it may be helpful to examine more closely the contexts in which the x-level actions occur. This may add to our understanding of salience or, at least, to our understanding of the range of possible variation within the signal. Similarly, it may be helpful to examine more closely the contexts in which z-level actions occur since some of the comments in section 4.0 linked this intensity level to the presence of affect.

5.1 Brow raises in 'q'

5.1.1 'x'-level

The five instances of an x-level brow action in the 'q' signal (see Fig. 5.7) occur in the three examples listed below:

(B) 2.33.0 NOTICE YOU

$1\underline{x}+2\underline{x}+5x$ + head tilt forward + '+' eye gaze

(W) 1.01.3 SUMMER STAY-1f++ THROUGH SUMMER

$1\underline{x}+2\underline{x}+5x$ + head tilt forward + '+' eye gaze

(W) 1.01.3 SHORT+

$1y+2\underline{x}+4x$ + (initial) headshaking + '+' eye gaze

As described in section 4.2.1.1, the first two questions listed above are felicitous; the third is not and follows a negated question ('No?') which gives it the initial AU 4 + headshaking. Other than having identical non-manual signals, the only other relevant similarity between the first and second question concerns the

Speaker's (assumed) certainty that the Addressee will perceive and respond to the question.

That is, in the first example, Brian has just stated his gleeful observation about 'the guys who took in all that money' and with his question, calls for Larry to comment on it. But, as can be seen on the timeline, Larry begins to comment on it before Brian initiates the manual portion of his question. Hence, there is little need for an optimally clear visual signal. In the second example, Wanda clearly has the role of questioner; this is her third question in a series of four. Cinnie is obviously attending and responding to Wanda's questions. Again the need for an optimally clear visual signal appears to be diminished.

5.1.2 'z'-level

The sixteen instances of a z-level (brow) AU in the 'q' signal (see Fig. 5.7) occur in nine of the sixteen yes-no question examples. Ten of these instances occur in the five examples where Speaker surprise has been identified (see section 4.2.1.1). That is, in each of these questions, both AUs 1 and 2 are at the 'z' level of intensity and support the hypothesis stated on page 183, which says that the presence of Speaker 'surprise' during a yes-no question will increase the brow raise to its highest intensity level.

The other six instances of a z-level brow action occur in the following four examples: (L) 9.08.2 (1z+2z+5x), (L) II 2.25.6 (1z+2z), (W) 0.44.1 (1z+2y+4z>), and (L) 8.02.6 (1z+2y+4x). Speaker surprise has not been identified in any of these examples.

However, the first two Larry examples are curiously similar in another way: both are preceded by a y-level brow raise (1+2). In the Larry 9.08.2 example (beginning videofield 37737), the question is preceded by an assertion -- 'he's a passer', identified by the headnod and the repeated, restrained movement of the sign which corresponds to the noun 'passer'. Normally, brow raises do not co-occur with assertions; so why the brow raise here?

Two possible explanations come to mind, which are not necessarily mutually exclusive. One focuses on affect; the other, on the subsequent question. Prior to the assertion, Brian has been talking about a football player named Randy Johnson who has a questionable track record. Larry interrupts Brian, seemingly perturbed by all the focus on Johnson, to ask why the team isn't using Theisman instead. Brian responds that Theisman hasn't been playing well -- to which Larry then responds by shaking his head and saying '(but) he's a passer'. The peak intensity brow squint (AU 4) and the (high) y-level nose wrinkling (and raised chin boss - AU 17) which precede the assertion reveal Larry's consternation and make plausible the explanation that his assertion is articulated with some exasperation. The next step is then to see if 'exasperation', in some contexts, is manifested with a brow raise (and AU 5?), which is intuitively reasonable, but not confirmable with this data. The second possible explanation for the brow raise is that of anticipatory assimilation with the following 'q' signal. This explanation is supported by the observation that all of the components of the 'q' signal are present during the assertion -- i.e. AU 1+2+5 + head (move) forward + '+' gaze.

Returning to the primary question of why a z-level brow raise occurs in this question (in the absence of surprise), we are led to consider the possibility that the brow raise increases in order to distinguish it from the preceding y-level brow raise. This would then help mark the beginning of the question. Similarly, in the Larry II 2.25.6 segment (beginning videofield 86940), the question (ACCEPT SIGN-paper FINISH GET) is preceded by a y-level brow raise and then increases to 'z', clearly marking the beginning of the question.

Observation of similar contexts in the data support the above account. There does seem to be a general tendency to visibly distinguish the onset of utterances which express separate (new) ideas. That is, recognizing that non-manual, syntactic signals are unlike intonation in spoken languages in that they do not have a "contour" which is repeated with each utterance of that syntactic type in a series, we see that it is quite possible for a series of utterances of the same syntactic type to 'share' the same non-manual signal.

For example, the same 'q' signal can mark two successive questions without a change at the onset of the second question. Indeed, this seems to be what occurs in the final portion of Larry II 2.25.6 where the brow raise and head forward position do not change between ACCEPT SIGN-paper and FINISH GET. (However, this lack of change plus the lack of any pause between SIGN-paper and FINISH could also be viewed as evidence that these are not separate questions, but are conjoined clauses in a compound question.)

Whereas it is (at least, physically) possible for utterances of the same syntactic type to be 'umbrella-ed' under the same non-manual signal without marking (non-manually) the onset of each separate utterance, this infrequently occurs. Instead, a change in intensity may mark the onset (e.g. also notice the increase in the y-level brow raise at videofield 86787 in the Larry 11 2.25.6 segment); or another signal is added to the next utterance; or there is a pause between them and the signal goes off, (e.g. see what happens at videofield 6756 in Wanda 1.01.3); or the lower face behaviors change (e.g. see what happens with the sign TRAVEL in Larry 1.26.9).

Thus, in this attempt to account for the z-level brow actions in the yes-no questions examples, two hypotheses have been offered. One concerns the presence of Speaker surprise; the other, the need to distinguish the onset of the question from the utterance which precedes it. These hypotheses account for 14 of the 16 instances of a z-level brow action.

The last two instances occur in Larry 8.02.6 and Wanda 0.44.1. In both examples, AU 1 is at 'z' and AU 2 is at 'y'. The other similarities are that AU 4 is present at the onset of AU 1, and that AU 2 begins about 20 fields after the onset of AU 1. I suspect the resultant initial 1+4 configuration is related to Speaker affect, but don't know what motivates the 'z'-level inner brow raise.

5.2 Brow raises in 'rhet.q'

5.2.1 'x'-level

The three instances of an x-level brow action in the 'rhet.q' signal (see Fig. 5.7) occur in two examples (Brian II 0.43.4 and Larry 7.30.2) which were discussed in some depth in section 4.2.3.1. The analysis of the Brian examples (beginning videofield 80179) suggested that Brian has begun to 'turn off' his focus on this utterance and has begun to think about something else (the name of the fourth football team). The low intensity of the brow raise (1x+2x) seems to support this analysis -- i.e. it is reasonable to assume that a decrease in focus/attention would result in a decrease in muscular tension or, from another perspective, in efforts to make the signal optimally clear.

In the Larry example (beginning videofield 31318), the facial configuration 1x+4y occurs during the rhetorical, and then the AU 1 decreases to offset while the AU 4 continues at apex.¹ This 1+4 brow configuration was previously analyzed in conjunction with the 'distress' hypothesis as well as the negation which precedes and follows the rhetorical. I don't know what accounts for the x-level AU 1, but note that the 1+4 initial configuration in Larry 5.58.9 (beginning videofield 25941) which was also linked to Speaker distress also seems to have had the same 'balance' (i.e. AU 4 stronger than AU 1).

¹In support of the hypothesis that a change in intensity may be used to mark the onset of an utterance, notice the 11-field decrease in AU 4 to 'x' between the rhetorical and the topic in the next utterance.

5.2.2 'z'-level

The four instances of z-level brow actions (see Fig. 5.7) occur in two examples -- Wanda 7.49.3 and Wanda 14.41.8. Both of these were previously identified as rhetorical questions which ask yes-no questions and exhibit the same behaviors as those found in 'q'. But why the z-level brow raises? Neither the surprise hypothesis nor the utterance onset hypothesis seem to be relevant to these examples.

Two non-compelling, but possible, explanations are that (a) rhetorical questions which ask yes-no questions are, in part, distinguished from actual yes-no via this difference in intensity; (one could argue that the third instance of such a rhetorical in the data, Brian 9.08.2 TRUE, does not fit the 'z' pattern because it also involves assertion-related behaviors, etc.), or (b) the z-level brow raise is due to individual variation -- since these two examples are the only rhetorical questions from Wanda in the data. However, such a claim would run counter to the (consistent) lack of individual variation in the composition of such syntactic signals in other parts of the data.

This will have to remain a question until more such instances can be analyzed.

5.3 Brow squints in 'wh-q'

5.3.1 'x'-level

The three instances of an x-level brow squint (AU 4) occur in Larry II 2.25.6, Brian II 4.57.2, and Wanda 1.01.3. The

manual portions of each example include a wh-sign -- which we might expect to be the case if the non-manual signal is less salient because of its low intensity.

The Larry and Brian examples are similar in several revealing ways: (a) the AU 4 does not completely overlap the wh-sign, (b) negation, which is also associated with AU 4, is present before/after the wh-sign, (c) the Addressee makes no effort to respond to the question, and (d) the Speaker continues his turn, without any noticeable pause, by asking another question (a yes-no question). On the basis of (c) and (d), we can assume that either the Speaker intended to have the Addressee respond to the question, realized this would not happen, and quickly adjusted in order to immediately pose another (hopefully more 'successful') question, or that the Speaker did not expect a response to the first question.

Analysis of all the available information suggests that the second of the two scenarios is more likely what happened. In the Larry example, the onset of AU 4 is after the onset of WHERE (whereas most instances of question signals show them beginning before the onset of the first manual sign -- see section 8.3), and AU 4 does not reach apex until after the offset of WHERE (i.e. after the completion of the wh question). This is so unusual that we should question whether the AU 4 here is actually functioning as a component of 'wh-q' or if it serves some other purpose. Looking at the following headshaking which negates DECIDE, we see that the AU 4 onsets five fields before the headshaking (which is within what appears to be the usual range for AU 4's

associated with negation) and that the apex of AU 4 'umbrellas' the sign DECIDE.. This is strong evidence that the AU 4 here is at least primarily, if not totally, a component of the negation signal rather than 'wh-q' (although we should ask why AU 4 appears before AU 1).

The Brian example raises similar questions. Here the wh-sign is a contraction, WHY_{NOT}, which occurs at the end of the utterance. AU 4 onsets (as the head tilts back) prior to the first sign, YOU, but offsets six fields before the offset of WHY_{NOT}. The apex of AU 4 begins four fields before the headshake (which negates 'playing quarterback') and ends during the sign/finger-spelling (Q-B) which follows the headshake. So the only thing 'umbrella-ed' by the AU 4 apex is the headshake -- which is evidence that the AU 4 here is related to negation. However, the evidence here is weaker than in the Larry example since the AU 4 onset does precede the entire utterance. In addition, one could argue (as some ASL teachers have informally) that the contraction WHY_{NOT} is influenced by English (e.g. 'Why not try it?') and behaves differently from other wh-signs, and hence may have influenced the early offset of AU 4.

Returning to the original question concerning whether the Speaker intended the Addressee to respond, one more observation from the Brian example is relevant: the head is tilted back at the initiation of the utterance. In section 4.2.2.2, I suggested that the three instances of backward head movement in wh questions may indicate that these questions are functioning in the

discourse as topics. If so, then one would not expect a response from the Addressee.

The evidence is by no means convincing but does point to the likelihood that the wh questions in both examples were not intended to 'stand alone'. The presence of 'wh-q' is questionable; there is no response pause after the utterances; and the Addressee not only doesn't attempt to respond but, in the Brian example, actually lowers his dominant hand to his lap during the end of the 'question'. Thus, the implication of this analysis is that the low, 'x' level of the brow squint in these two examples is influenced by the fact that it is not marking a question for which the Speaker expects an immediate response.

The third instance of an x-level AU 4 occurs in Wanda 1.01.3 (beginning videofield 6475). Here AU 4 onsets before the beginning of the first manual sign, reaches apex shortly after that onset, and continues at apex until Cinnie begins to respond. In this example, AU 4 is clearly part of 'wh-q' and the Speaker does expect a response to her question. (Notice how YOU is held, calling forth the response.)

In trying to understand why the AU 4 is at such a low, and presumably less salient, intensity during this question, two observations are relevant. First of all, this question appears as the second question in a series of four; the third and fourth were described in section 5.1 as also having x-level brow actions. Cinnie attends to each of the questions, responds appropriately, and does not attempt to take control of the 'floor'. Thus, Wanda clearly has the floor and the role of questioner.

Noting that her first question occurs with a y-level brow raise and that the second and third questions involve x-level brow actions, perhaps the strategies signers use to make signals salient (such as by maintaining a higher intensity level) can be relaxed when other factors in the environment help make clear the function of the utterances. That is, in this case, if it's already clear that Wanda is asking questions (and not having to 'work' to control the floor), then perhaps there is less need for an optimally clear facial signal of the question.

The second relevant observation is that an AU 9 (nose wrinkler) also largely co-occurs with the question (as well as Cinnie's response). As noted earlier in Figure 5.2, AU 9 is the most frequently co-occurring lower face AU in wh questions. One of the effects of this action is a lowering (pulling down) of the brows, which is also an effect of the AU 4 action. Thus, when in combination (i.e. AU 4+9) as they are in this example, the effect may be a more intense brow lowering than would occur with AU 4 alone. So, the lessening of salience attributable to the lower intensity of AU 4 may actually be compensated for by the presence of AU 9.

5.3.2 'z'-level

There are two instances of a z-level AU 4 in the wh question data; one occurs in Larry 9.08.2 (beginning videofield 37512) and the other in Larry 12.42.5. Both are alike in that they are pre-

ceded by a y-level AU 4¹ (and these are the only such instances in the data). Thus, following the hypothesis proposed in section 5.1.2, the increase to 'z' in these examples may reflect the need to distinguish the onset of the question from the utterance which precedes it.

5.4 Summary

In the beginning of section 5.0, we saw that the majority of brow actions in the three question signals are at a 'y' level of intensity, although over half of the brow raises in this sample of yes-no questions are at the 'z' intensity level. Assuming, then, that the 'y' level may be the norm for such brow actions, subsequent sections attempted to understand what factors might lead to an increase or decrease from the norm.

In these discussions, it was argued that x-level brow actions may occur when there is "less need" for the more visually clear question signal. Instances of "less need" were defined as: (a) when the Speaker clearly has the floor and has been asking a series of questions to which the Addressee has been faithfully responding, (b) when the Addressee has already begun to respond to (some aspect of) the question before the Speaker begins it, and (c) when the Speaker is asking a question that s/he does not intend the Addressee to respond to (for example, when the wh question is functioning in the discourse as a topic).

¹The preceding intensity level of AU 4 is not indicated on the Larry 9.08.2 timeline. However, the intensity of AU 4 between videofield 37459 and 37525 never goes below 'y'. The y-level AU 4 in Larry 12.42.5 occurs during the segment which was identified as a topic in section 4.2.2.1, FUTURE SATURDAY.

Two major hypotheses were proposed to account for the majority of z-level brow actions. One concerned the presence of Speaker surprise during yes-no questions. The second concerned the way signers mark the onset of the question (by raising the intensity level of the brow action) in order to visually distinguish it from a preceding utterance which is accompanied by the same brow action.

Overall, the results of this analysis of the intensity level of brow actions in 'q', 'wh-q', and 'rhet.q' support Hypothesis 5. However, the underlying assumption of "the bigger the better" (in order to achieve salience of the visual signal) needs to be modified since the highest level of intensity seems to be reserved for special contexts.

Another assumption concerning how salience may be achieved is presented in Chapter III as Hypothesis 6:

Hypothesis 6

No single facial behavior by itself (e.g. brow raise or brow squint) will be found to serve a linguistic function.

Returning to the summary presented in Figure 5.6, we see support for this hypothesis from 'q' and 'rhet.q' (wh and y/n), but possibly counter evidence from 'wh-q'. That is, 'wh-q' involves one brow action and does not, on the basis of this data, include any predictable head movement. However, it does, like the others, involve '+' eye gaze (although this characteristic feature of questions is obviously a byproduct of the modality of the language -- i.e. the Speaker's monitoring of reaction and understanding of the question requires it as well as the Addressee's ability to respond).

In any case, it now appears that an underlying assumption of this hypothesis -- that a linguistic facial behavior simply 'appears' to serve its function and then 'goes off' -- overlooks important details concerning how and where the behavior appears and goes off, details which may also be "components" of the signal. These questions are the subject of the next two sections.

6.0 Relative onset, apex, and offset durations: upper face

As described in Chapter III, Hypothesis 13 makes predictions concerning the duration of the onset and offset of facial actions in linguistic signals as well as the character of their apex.

Hypothesis 13

Facial actions which serve linguistic functions will be characterized by sudden onset (rapid movement to apex), little change during apex duration, and sudden offset.

Figure 5.8 reports some of the information on duration of upperface actions in linguistic signals necessary for evaluating Hypothesis 13. Several very interesting results emerge from this analysis. First of all, we can see that the average onset durations of the upperface actions in all three signals are nearly identical (i.e. 8-9 videofields, or 133-150 milliseconds) when the onsets of 'x', 'y', and 'z'-level actions are added together.

	Avg. Onset	Avg. Offset	Range Onset	Range Offset	Avg. Apex	Range Apex
q						
AU 1+2*	8.5	15	3-17	3-40	31	9-85
AU 1+2+5	8	14	2-17	3-40	30	9-89
wh-q						
AU 4	9	18	1-17	3-73	57	13-176
rhet.q						
AU 1+2	9	9	2-23	2-31	25	5-77

Fig. 5.8 Duration in videofields of upperface actions in 'q', 'wh-q', and 'rhet.q'

Note: The numbers correspond to videofields where one field = 1/60th second or 16.67 msec. The scores for AU combinations (e.g. 1+2+5) were reached by tabulating the scores for each AU independently and then combining them. Here "onset" duration corresponds to the period of time between the onset of the AU and the beginning of its apex. Similarly, "offset" duration corresponds to the period of time between the end of the apex and the offset of the AU.

As seen in Figure 5.9, when the onsets of only the y-level brow actions (presumably the norm) are tabulated, their averages differ somewhat more.

*One highly skewed example has been deleted from the offset tabulation for 'q' (1+2) — that of Wanda 1.01.3(1), which showed an offset from an 'x' apex of 132 fields.

	q: AU 1+2 (N=10)	wh-q: AU 4 (N=5)	rhet.q: AU 1+2 (N=19)
y-level AUs Avg. Onset:	7.6	6.6	8.8

Fig. 5.9 Average onset duration of y-level brow actions*

However, according to neuroanatomist Basmajian¹, the intensity level of the facial action is not a strong determinant of its onset latency (the period between AU onset and apex onset). Instead, psychophysical factors such as emotional state or fatigue level are more predictive of onset duration than neurological or bio-mechanical factors relating to intensity level. And this fact helps explain why, for example, within the same person, an x-level brow raise may appear with a longer onset duration than a z-level brow raise. Similarly, it helps us understand why the range of onset durations may be similar across different intensity levels although their averages may appear to pattern with those intensity levels -- as seen in the case of brow actions in 'q' (Figure 5.10).

AU 1/AU 2:	x-level (N=5)	y-level (N=10)	z-level (N=8)
Average Onset Duration	7.4	7.6	11.5
Range: Onset Duration	3-12	4-13	3-17

Fig. 5.10 Brow actions in 'q': onset duration x intensity level

*The Ns vary from those shown in Fig. 5.7 because the onset duration was not measurable in some cases.

¹Information from Dr. J.V. Basmajian, author of *Muscles Alive* (Baltimore: Williams & Williams, Co. 1974), was obtained during conversations with him about the issues discussed in this and the next section. Dr. Basmajian is presently with the Shedoke Rehabilitation Center in Hamilton, Ontario.

Returning to our discussion of the results presented in Fig. 5.8, we see that whereas the onset durations of the upperface actions are quite similar, they differ markedly in offset duration. Two points are noteworthy: (a) the average offset durations of 'q' and 'wh-q' actions are much longer than their respective onset durations (approximately twice as long), but (b) this is not the case with the 'rhet.q' actions -- which show the same average duration for both onset and offset.

Why the significant difference in onset and offset durations for 'q' and 'wh-q' actions? Again, according to Basmajian, there are no neurological determinants of this difference; instead, this is a learned difference -- which we would expect to be the case because of the 'no difference' offset score for 'rhet.q' actions.

Why would a signer "learn" to, on the average, speed up the onset and stretch out the offset of such actions? I suspect the rapid onset to apex facilitates effective transmission of the message, and that the stretched out offset of question-signaling AUs promotes a more "smooth transition" from the role of questioner to that of receiver of the response. That is, the rapid increase in intensity to apex does two things: it makes the facial signal more 'sharp' (Voila! It's there!), and it also means the signal is clearly visible and identifiable by the time the manual lexical items in that syntactic unit are initiated. (As seen in section 8.3, over 50% of the facial actions in all three signals have reached apex by the time the first manual sign in the utterance is initiated.)

The longer offset durations are intuitively sensible in several ways. First, it is not apparent what would be gained by having a similarly rapid offset. Second, as will be seen in later sections, the location of the offset is much more variable with respect to the termination of the manual signs in the utterance, suggesting that this event is of lesser significance for efficient transmission of the message than the onset event. Third, the state of 'having a question' is not suddenly changed by the fact that the Addressee initiates a response. Thus, we sometimes see that the Speaker's question-related AUs continue on during the Addressee's response. Perhaps, as the Speaker has less and less of a question as the Addressee's response is formed, the question-signaling AUs gradually decrease in intensity.

Why the difference in average offset durations between 'rhet.q' and the other two signals? Obviously, the major difference between rhetorical and the questions signaled with 'q' or 'wh-q' is relevant here: in most 'real' questions, a shift in turns is anticipated, whereas the Speaker will always continue his/her turn after the rhetorical. Since, as described in Chapter II and elsewhere, the facial behavior of signers generally shifts at grammatical boundaries, we would expect at the completion of the rhetorical to see a shift to those facial behaviors appropriate for the next grammatical unit. Looking at the duration of the juncture between the end of the last sign in the rhetorical and the beginning of the next sign, we find an average period of 5 videofields (range 1-13) or 83 msec. Thus, the span of time available for shifting facial behaviors is relatively short and

helps account for the more rapid offset duration of brow actions in the rhetorical.

Returning to the questions raised by Hypothesis 13, are the upperface actions in these linguistic signals "characterized by a sudden onset" (rapid movement to apex) and a "sudden offset" (rapid movement from the end of the apex to AU offset)? Obviously, "sudden" is a relative term and presupposes a knowledge of what is a normal or non-sudden rate, which is information not yet available. What we can say at this point is that both the onset-to-apex and end apex-to-offset periods are, in general, much shorter than the period of the apex between them, as shown in Figure 5.8. In some linguistic signals, here 'q' and 'wh-q', the onset period is much shorter than the offset period and, hence, the onset is faster than the offset. Finally, in the three linguistic signals analyzed here, the apex period is characteristically smooth -- i.e. there is little change in intensity during the apex. These combined observations are reflected in the following illustrations.

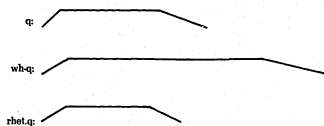


Fig. 5.11 Proportional model of upper face AU parameters
in three question signals

The illustrations above, based on the averages reported in Figure 5.8 for each respective onset, offset, and apex, provide a model of the characteristic behavior of upperface actions in each question signal.

7.0 Relative onset, apex, and offset durations: AU 12 smiles

Hypothesis 14 anticipates ways in which facial actions which express the Speaker's affect will differ from those which signal linguistic meanings.

Hypothesis 14

Facial actions which express (felt) emotions will be characterized by either (a) comparatively slow onset, (b) comparatively slow offset, and/or (c) variation in intensity during apex.

The most difficult problem encountered when attempting to test this hypothesis concerns the identification of facial actions which express "felt" emotions. That is, Ekman and Friesen's work has clearly shown that certain facial actions will appear when the Speaker actually feels an emotion and does not attempt to control his/her expression of that emotion. However, those same actions may be used (either intentionally or as a learned, out-of-awareness behavior) to "mask" or control the expression of a different affect or to feign an experiencing of the first emotion.

For example, Ekman and Friesen (1982) distinguish three types of "smiles": felt smiles (spontaneous expressions of positive emotion), false smiles (deliberate attempts to appear as if positive emotion is felt when it isn't), and miserable smiles (acknowledgements of feeling unhappy). The category of false smiles includes both masking smiles and feigning smiles. The

authors hypothesize that felt smiles can be distinguished from the other smiles by analyzing three things: (a) which muscle actions compose the smile -- i.e. felt smiles are composed of zygomatic major actions (AU 12) and orbicularis oculi actions (AU 6 and/or 7), but not caninus (AU 13), buccinator (AU 14), or risorius (AU 20) actions, (b) variations in the intensity of the actions¹, and (c) the timing of the actions -- i.e. felt smiles usually have gradual or smooth onset and offset periods², and generally are not shorter than 2/3 second in total length nor longer than 4 seconds.

If we do not distinguish instances of AU 12 (which pulls the lip corners obliquely upward) in this way and simply calculate the onset, apex, and offset times of all such instances in the data, we obtain the results seen in Figure 5.12. These calculations are based on 19 "simple" events for which information on all of the individual measures (e.g. AU onset, apex offset) are available on the timelines. "Simple" means the intensity level of the AU does not vary at apex; this criterion excludes 4 other instances of AU 12 (which include the only instances of z-level actions) from the analysis here.³

¹Ekman & Friesen (1982) do not specify what they expect to occur in felt smiles with respect to variations in intensity other than to say that intensity of AU 12 is correlated with degree of happiness.

²I deduced this feature of felt smiles from the authors' description of false smiles (p. 247).

³These 4 instances are excluded because they can not be measured in the same way as the others. For example, they do not reach a complete offset from their first apex before going on to begin a new increase to another apex. They are mentioned again later in this section.

	Avg. Onset	Avg. Offset	Range Onset	Range Offset	Avg. Apex	Range Apex
(N=11) AU 12x	8	9	1-15	2-30	11	4-31
(N=8) AU 12y	8	11	1-18	4-26	16	3-34
(N=19) x + y	8	10	1-18	2-30	13	3-34

Fig. 5.12 Duration in videofields of AU 12 actions in question data

Comparing these results with those obtained for upperface actions in the question signals yields several general observations: (a) the average and range of the onset scores are very similar to those of all 3 question signals, (b) the average and range of offset scores are very similar to those of the rhetorical questions, and (c) the average and range of the apex duration scores are markedly smaller/lower than the scores for all 3 question signals.

On the basis of these observations, we would need to reject Hypothesis 14 if we assume that all of these instances of AU 12 are expressions of a felt emotion. On the whole, this facial action does not, in comparison with the facial actions in the linguistic signals, have a slow onset nor a slow offset and does not vary in intensity after reaching its first apex.

Another option is to decide that most of these instances of AU 12, though seemingly affect-related, do not express felt emotions. Evidence in favor of this decision focuses on how most of these instances do not fit the criteria proposed by Ekman and Friesen. That is, the average total duration of these AU 12's is

31 fields or 517 milliseconds -- which is below the 2/3 second lower limit criterion; most do not have a comparatively slow onset or offset (although both are generally smooth); and most do not co-occur with AU 6 or 7. On the other hand, 3 of the 4 instances of AU 12 rejected from the previous analysis do appear with AU 6 or 7¹, do show variations in intensity with more than one apex, and do fall within the 2/3 second to 4 second predicted range for "felt" AU 12's. Perhaps these three do express a felt emotion and, thus, are supportive of Hypothesis 14.

Again, the key problem is that of determining the function of each AU 12. Ekman and Friesen (1982) propose various physical criteria for making this judgement, but note that their hypotheses concerning AU 6 and 7 and the timing of AU 12 still need to be tested. Additionally, it is important to note that the experiments which led to the formulation of these criteria involve observations of AU 12 behavior in only certain contexts -- when people are viewing amusing films, when people are lying (intentionally not telling the truth), and when psychiatric patients are being interviewed. Would the same behaviors occur during normal conversations?

¹These three occur in (W) 1.20.3, (B) 2.33.0, and (L) 11 5.02.0. However, due to a scoring error, the AU 6 in the first segment and at the end of the second and third segments is not on the respective timelines. The fourth such AU 12 occurs in (L) 14.50.1 and does not co-occur with AU 6 or 7.

In any case, there are reasons to think that communication via a signed language like ASL may affect the spontaneous facial expression of emotions in ways different from the behaviors found among hearing conversants. Timing, in particular, would likely be affected because facial actions also have linguistic functions which are tied to the manual stream of behavior.

For example, as remarked in section 4.1, lower face, affect-related AUs tend to occur before and after the last sign in a rhetorical question but not during it. Looking at the first rhetorical in Brian II 0.43.4, we see two instances (each less than 384 msec. long) of a y-level AU 12 separated by the sign WHY. Both instances have a short onset and offset and a constant apex (the second of which co-occurs with AU 7 and ends before the onset of the next proposition). So both AU 12's do not meet Ekman and Friesen's criteria with regard to the timing of expressions of the felt emotion. Yet the message is amusing, and there is no reason to think Brian is trying to display an emotion he is not, in some way, experiencing. It is not apparent why the AU 12 disappears during the rhetorical, but the fact that similar behavior occurs in the majority of examples suggests this is a language-related pattern -- which then may be influencing the affect-expressive facial actions.

An even stronger case can be made for the influence of linguistic structure on the expression of affect in Larry II 5.02.0. By the end of this segment, both signers are laughing together at the 'pathetic' situation Larry describes. The last instance of AU 12 in the segment exhibits the kind of behavior predicted by

Ekman and Friesen for felt expressions and does co-occur with an AU 6 (not shown on the timeline) which begins at videofield 96156 and reaches apex at 96170. Thus, if we can assume that this last instance expresses a felt emotion, then (I assume) we can feel a little more confident in evaluating the AU 12 which begins at videofield 96009 as an expression of a similar emotional state. Note that once again there's a break in the "smile" during the rhetorical sign WHYwg. Also note that this smile begins right after the 16+20+25 caused by Larry's mouthing of the word 'end', quickly reaches apex, and then has a relatively long offset (the longest in the y-level data reported in Fig. 5.12). Why the short apex and, hence, long offset? I suspect it's due to the sign KISS-FIST which involves doing what the gloss says -- i.e. kissing the back of one's fist (seen in the 17+18). The AU 12 begins its offset in anticipation of that sign-related facial movement, but does not complete its offset until just before the rhetorical WHYwg.

If we accept that a goodly portion of the AU 12's in the data which do not conform to Ekman and Friesen's description of AU 12's that express felt emotions nonetheless do express felt emotions, then we are led to assume that either their (E & F's) description: (a) is inaccurate, (b) does not fit what happens in signed communications, or (c) concerns only one type of felt-emotion smile. The third alternative is based on: (a) recognition that some of the AU 12 smiles in the data do fit E & F's description, (b) observation that a fair number of the other AU 12 smiles in the data, which do not conform to the description,

still seem to be felt (as opposed to false) smiles, and (c) mention by E & F (1982) of the existence of sixteen other kinds of smiles (Ekman, in preparation).

It may be that the majority of the smiles summarized in Figure 5.11 are voluntary expressions of a felt, positive emotion, but are different from the spontaneous, reactive (?) types of smiles that the E & F article associates with a felt, positive emotion. As Tomkins (1975) notes, because the face is under the joint command of the voluntary and involuntary nervous system, purely innate, involuntary affective responses on the face are rarely seen. Tomkins adds that "normally, what we see on the face of the adult even when an innate affect is triggered, is some transformation of the innate response which is superimposed on the innate response" (p.558). I have suggested that the "transformations" reflected in this data are influenced by the linguistic structure of ASL and the dynamics of communication in a visual-gestural language. However, they (or some of them) may, in fact, be more universal in nature and reflect what happens when friends engage in free conversation. The latter possibility awaits similar study of hearing and speaking friends' smiles.

Returning to Hypothesis 14, we have to conclude for the moment that while some facial actions which (we think) express a felt emotion do conform to the predictions in the hypothesis, others, which also seem to be expressions of felt emotion, do not support the hypothesis. Instead, these actions are better described by the tenets in Hypothesis 13 -- which then raises questions about just how separate are the components of this linguistic

system from the behaviors associated with the expression of affect.

8.0 Relative onset, apex, and offset locations: upperface, head, hands & arms

In this section we will examine the relative temporal locations of each component of 'q', 'wh-q', and 'rhet.q' with respect to the other components in each respective signal and to the manual signs within each question. The results of this analysis will be compared with the predictions stated in Hypotheses 1-4.

8.1 Upperface AUs in 'q' and 'rhet.q'

Hypothesis 1 makes predictions about the apex location of facial actions with respect to each other.

Hypothesis 1

When two or more facial actions are components of the same linguistic signal, they will co-occur (i.e. occur at the same time) in their apex onset, duration, and apex offset.

As described in section 5.0, the linguistic signal 'q' has three upperface actions (i.e. 1+2+5), and the linguistic signal 'rhet.q' has two (i.e. 1+2). (The signal 'wh-q' only has one and thus is not useful for this analysis.) To test Hypothesis 1 with the available data, we need to compare the apex onset and apex offset locations of AUs 1+2+5 in 'q' and AUs 1+2 in 'rhet.q'.

Figure 5.13 provides this comparison and a similar comparison of AU onset and offset for the three facial actions in 'q'. The figure first addresses the question of co-occurrence for AUs 1 and 2 and then for the co-occurrence of AU 5 with 1+2.

	AU Onset		Apex Onset		Apex Offset		AU Offset	
	yes	no	yes	no	yes	no	yes	no
'q'								
AU 1+2 same?	(N=12) 10 2		(N=13) 11 2		(N=14) 14 0		(N=13) 12 1	
AU 1 before 2?	2	0	2	0	0	0	0	1
AU (1+2)+5 same?	(N=10) 1 9		(N=10) 6 4		(N=10) 2 8		(N=10) 1 9	
AU 5 before 1+2?	2	7	3	1	7	1	8	1

Fig. 5.13 Relative locations of upper face AUs in 'q'

Note: The value of N varies according to the information available on each timeline. For example, although there are 16 examples of 'q' in the data, information on the relative AU onset of 1+2 is available in only 12 examples because the 1+2 is already on the face from a prior utterance in 3 examples and AU 2 does not appear in 1 example.

As shown in the first row, all four locations of AUs 1 and 2 generally co-occur. Examination of the timelines shows that where they don't co-occur, it is because AU 1 is involved in a prior event or continues on the face for the next event.

However, as shown in the third row, the onset of AU 5 coincides with the onset of 1+2 in only one example. In general, the onset of AU 5 occurs after the onset of 1+2 (range = 3-20 fields after 1+2 onset). In the two examples where AU 5 onsets before 1+2, the onsets are very close — 2 and 4 fields apart.

In contrast, the apex onsets of AU 5 and 1+2 are much more similar. They are the same in six examples, and in three examples, AU 5 begins its apex only 2-4 fields before the apex of 1+2.

The apex of AU 5 begins after the apex of 1+2 in only one example, where it begins 8 fields later.

In contrast to the apex onset similarities, the apex offsets of AU 5 and 1+2 co-occur in only two examples. Of those seven examples where the apex of AU 5 ends before the apex offset of 1+2, the range is 1-19 fields (although in a few examples, the exact difference is undeterminable because the 1+2 apex continues on for another event).

The AU offsets of AU 5 and 1+2 vary widely, coinciding in only one example. Of the other nine examples, AU 5 ends 4-90 fields before 1+2 in eight examples and over 40 fields after the 1+2 offset in one anomalous example (Brian II 11.46.9).

Summarizing these findings, we see that facial actions 1 and 2 generally coincide with each other but 'umbrella' AU 5. That is, AUs 1+2 generally begin before and end after AU 5. The one location where all three actions tend to coincide is their apex onset.

The data on facial actions 1 and 2 in 'rhet.q' are consistent with those in 'q': in all but one example, all locations are the same; in that one example, AU 1 onsets before AU 2. The AU 5 that may be a component of the signal for rhetorical questions (section 4.2.3.1) is not considered here due to the small number of such examples (3).

Returning to the predictions of Hypothesis 1, we have found support for the idea of a co-occurring apex period with the brow raising actions in 'q' and 'rhet.q'. However, the eyelid raising action in 'q' generally supports this hypothesis only for its

prediction of a co-occurring apex onset. Much more variation occurs in the relative apex offset of AU 5, although it does tend to occur during the apex of 1+2.

8.2 Head movements and facial actions in 'q' and 'rhet.q'

Hypothesis 2 makes predictions about the presence of linguistic behaviors of the head and eye gaze with respect to the apex period of facial actions.

Hypothesis 2

When movements of the head and/or eye gaze are components of a linguistic signal, their simple onset, duration, and offset will co-occur with (i.e. be present during) the apex onset, duration, and apex offset of any facial actions in the same signal.

As described in section 5.0, the linguistic signal 'q' has two alternative or co-occurring behaviors of the head: forward movement and downward movement. Similarly, the signal 'rhet.q' has backward head movement and/or sideways head movement (when asking wh questions). No head behavior is specified for 'wh-q'. To test Hypothesis 2 with the available data concerning head movement, we need to compare the onset and offset locations of the above-mentioned head behaviors with the apex onset and apex offset locations of facial actions which are components of those same signals.¹

¹We already know from the calculations provided in Figure 5.3 that all three question types are characterized by continuous '+' eye gaze. As such, the presence of '+' eye gaze at various locations is not discussed again here.

Figure 5.14 provides this comparison and a similar comparison of the onset and offset of component head movements in relation to the AU onset and offset of component facial actions (i.e. 1+2). This figure shows, in the middle four boxes, a general confirmation of Hypothesis 2 with respect to the presence of component head movements during the apex of facial actions in the same signal. In the exceptions to this finding, the head movements are usually present within 2-4 videofields of the facial apex onset or offset.

Present:	@/before 1+2 onset*	during 1+2 apex onset	during 1+2 apex offset	@/after 1+2 offset
Head in 'q'	(N=11) 5	(N=11) 10	(N=10) 8	(N=8) 5
in 'rhet.q'	(N=11) 2	(N=11) 9	(N=11) 10	(N=11) 8

Fig. 5.14 Presence of head components of 'q' and 'rhet.q' in relation to facial locations

Note: The value of N varies according to the information available on each timeline and the number of examples of each question type which contain the component head behaviors. For example, 11 of the 16 yes-no questions contain forward and/or downward head movement; however, in 3 examples, the 1+2 does not offset after the question but continues on for the next utterance. Hence, the value of N in the upper, right box is '8'.

The figure also shows that the facial 1+2 tends to appear before the head movement begins in rhetorical questions. No clear pattern exists for which begins first — face or head — in yes-no questions, nor for which ends first. However, for both 'q' and

*In the few examples (noted in Fig. 5.13) where AUs 1 and 2 don't coincide, AU 1 was used as the basis for measurement.

'rhet.q', the brow raise and head movement generally onset within 9 fields of each other.

8.3 Facial actions and manual signs in 'q', 'rhet.q', and 'wh-q'

Hypothesis 3 makes predictions about the apex of facial actions with respect to the onset and offset of the manual signs in that grammatical unit.

Hypothesis 3

Facial actions in a linguistic signal will co-occur in their apex onset, duration, and apex offset with (i.e. be present during) the simple onset, duration, and offset of the manual sign(s) in that linguistic unit.

To test the predictions of Hypothesis 3 with the available data on each question type, we need to compare the apex onset and offset of component facial actions with the onset of the first and offset of the last manual sign in each corresponding utterance. Figure 5.15 provides this comparison as well as a comparison of those manual measures with the actual onset and offset of the facial actions.

	AU Onset @/before first sign	Apex Onset @/before first sign	Apex Offset @/after last sign	AU Offset @/after last sign
q (AU 1+2)*	(N=13) 12 92%	(N=13) 9 69%	(N=13) 2 15%	(N=11) 4 36%
wh-q (AU 4)	(N=10) 10 100%	(N=11) 6 54%	(N=10) 7 70%	(N=9) 7 78%
rhet.q (AU 1+2)	(N=14) 13 93%	(N=14) 9 64%	(N=14) 3 21%	(N=14) 13 93%

Fig. 5.15 Facial action locations in relation to lexical string onset/offset (A)

Note: The value of N varies with the information available on the timelines. For example, when a facial action stays on the face after the (lexical) offset of that question because the signer will ask a second question (which uses the same action) it does not have an "AU Offset" in reference to the first question.

Two additional rules were used in scoring apex offset and AU offset because signers often hold the last sign in a yes-no or wh question for long periods of time. If the AU was still at apex at or after the beginning of the final sign hold, the apex offset decision was scored as "yes". If the AU was still present ≥ 12 fields after the beginning of the final sign hold, the AU offset decision was scored as "yes".

As described in Chapter IV (section 2.4.3), the procedures used here to determine the onset and offset of a sign yield a somewhat maximally extended duration. That is, the onset location corresponds to the first videofield in which the (first, dominant hand) handshape of that sign is fully formed, although this formation usually occurs before arrival at the place where the sign is made and before initiation of the sign's movement. In the same

*First, AU 5 is not included here since, as seen in Fig. 5.13, it behaves somewhat differently from AUs 1 and 2. Second, in those few cases where AUs 1 and 2 behave differently, the locations of AU 1 were used for comparison with the corresponding manual onset/offset.

way, the offset location corresponds to the last videofield in which the (last, dominant hand) handshape is fully formed.

Since a fair number of the facial locations were very close to, but not at, the locations counted binarily as "yes" scores and since Figure 5.15 is based on a stretched out definition of a sign's onset and offset, a second calculation was done with a slightly modified definition. This definition made the onset of the first sign 3 videofields later and the offset of the last sign 3 videofields earlier.¹ Results of this second calculation are shown in Figure 5.16.

	AU Onset ‡ 3 fds. after sign onset	Apex Onset ‡ 3 fds. after sign onset	Apex Offset ‡ 3 fds. before sign offset	AU Offset ‡ 3 fds. before sign offset
q (AU 1+2)	(N=13) 12 92%	(N=13) 12 92%	(N=13) 3 23%	(N=11) 5 45%
wh-q (AU 4)	(N=10) 10 100%	(N=11) 6 54%	(N=10) 7 70%	(N=9) 7 78%
rhet.q (AU 1+2)	(N=14) 13 93%	(N=14) 11 79%	(N=14) 8 57%	(N=14) 13 93%

Fig. 5.16 Facial action locations in relation to lexical string onset/offset (B)

Figure 5.16 presents several interesting differences across question types which become understandable when recalling the information about turntaking and end-string lengthening provided

¹Review of the more detailed scores (described in IV.2.4.3) of the internal parts of each sign showed that this later onset score, for most signs, still marked a time before onset of the sign's movement or contact. Similarly, the offset was still after the sign's movement/contact.

in section 3.0. What follows is a discussion of these differences as well as a comparison of relative location scores within each question type.

8.3.1 'q'

The most striking differences between onset and offset scores are seen in the case of the yes-no questions. In all but one example, the brow raise in 'q' has begun and has reached apex by the time the first sign begins. In the counterexample, Larry 8.02.6, AU 1 does actually reach apex (field 33246) before the hand arrives at the face (field 33247) and begins its movement. So the part of Hypothesis 3 which concerns apex onset receives support from the 'q' data.

However, the apex offset scores in the 'q' data show that most of the 1+2 actions are no longer at apex when the manual string offsets. Furthermore, less than half of the 1+2 actions are even on the face when the manual string ends. (Observation of the timelines shows that they reached offset from 4 to 24 fields before the manual offset).

Why this 'early' offset? Two facts about these questions are important to recall. First of all, what was described previously as Addressee overlap (section 3.2) occurs in 13 of the 16 yes-no examples. During this overlap, the intensity level of the 1+2 often drops (unless the Speaker plans to continue) and gradually tapers off (yielding the longer offset durations described in section 6.0) even though the Speaker's manual string may not yet have reached offset.

Second, and perhaps most important, the construction of the manual strings in the yes-no question examples frequently provides redundant information at the end of the question. That is, in 8 of the 16 examples, one or more of the signs in the question is repeated (occurs again) at the end of the question; in three of the examples, the pronoun YOU occurs at the end of the question (although the second person reference is already obvious because of 'q')¹; in another example, the sign QMwg occurs in question-final position (also redundant with 'q', although having additional pragmatic meaning). Looking again at the timelines, we see that if these final signs were deleted and the offset location of the sign before them was used to calculate apex and AU offset for Figure 5.16, 9 of the 10 counterexamples would change to "yes" scores for apex offset and/or AU offset. That is, in these questions, the apex of the facial signal usually continues until the Speaker begins to repeat some of the information. Thus, tying together these two facts concerning Addressee overlap and Speaker repetition, we see that the Addressee generally initiates a response when the Speaker is repeating information, and this is when the facial apex offsets and gradually moves to full offset.

8.3.2 'wh-q'

Figure 5.16 reports that all of the AU 4's in 'wh-q' are

¹In some cases more clearly than others, the question-initial or -final YOU seems to be an attention-getting, turn-taking signal (like the manual gesture glossed as "UMMM" in the Baker & Cokely texts) and perhaps not actually a part of the grammatical structure of the question.

on the face before the onset of the first manual sign in the question. Only slightly over half of them are at apex at or before the manual onset. However, of the 5 counterexamples, 2 show AU 4 reaching apex 5 fields after the manual onset and at or before the (first) contact in the sign. Thus, these examples are still similar to the other 6 "yes" examples.

Of the remaining 3 examples, 2 happen to be the two described in section 4.2.2.2 as wh questions which seem to function like topics (and are accompanied by a head tilt back). It is noteworthy that, contrary to the 'short' onset followed by a smooth (non-pulsating) apex which is characteristic of all the questions, these two examples show a more gradual onset to a relatively short peak and then an offset (see especially Cinnie 5.07.8). That is, instead of 'umbrella-ing' the grammatical unit with their apex, they seem to almost stress one constituent within the unit by having the apex coincide with that constituent. Informal observation of other topics (like the ones Liddell 1977/80 describes) suggests this 'peaking' may be a more general topic-related behavior -- and, if true, a way in which the behavior of facial actions in topics differs from their behavior in questions.

The apex and AU offsets of the AU 4's in wh-q provide some support for the previous analysis of 1+2 offsets in 'q' as influenced by question-final repetition and Addressee overlap. That is, the previous analysis suggested that the relatively high degree of overlap and repetition in the yes-no question examples led to the earlier apex and AU offsets, respectively, 23% and 45%. Recalling that Addressee overlap occurs in only 3 of the 13 wh

questions, that the sign YOU occurs at the end of 2 of the examples, and that final sign repetition occurs in only 1 example, we can see that these differences from the yes-no questions are reflected in the higher apex offset and AU offset scores, respectively, 70% and 78%. Among the 3 counterexamples to the apex offset prediction are the 2 examples recently discussed as topic-related. One of these is also a counterexample for AU offset.¹

8.3.3 'rhet.q'

The calculations in Figure 5.16 for the 1+2 in the rhetorical questions also support the apex onset prediction of Hypothesis 3. All but one of the brow raises are present before the manual onset, and all but three are at apex by the time the first sign onsets. The counterexample in AU onset is also a counterexample in apex onset: Brian II 0.43.4(2). This is the example discussed at length in section 4.2.3.1 which analyzes the "displaced" facial signal as partial evidence of the lack of Speaker attention to his own utterance (while intensely trying to remember information necessary for his next utterance). Of the other two counterexamples in apex onset, one is the direct address rhetorical (Wanda 14.41.8) which builds to a z-level apex toward the end of the question; the other is the rhetorical which shifts from a 1+4 to a 1+2 midway through the sign REASON (Larry 5.58.9).

¹The remaining counterexample within these two offset categories is in Larry 14.50.1 where the question was analyzed as composed of two signs, R- "WHAT", even though the facial onset of 'q' to apex during the second half of "WHAT" is anomalous. Perhaps this reflects the Speaker's confusion?

All but the Brian II 0.43.4(2) example show the facial signal still present at the offset of the last sign in the rhetorical. However, only 57% are still at apex at this time. Of the 6 counterexamples, 2 (Larry 0.16.2 and 5.58.9) are like the 57% in that the facial apex is still present during the movement of the last sign.

Of the remaining 4 examples, one is, again, the Brian II 0.43.4(2) anomalous example; the other three are in (L) 7.30.2 and II 19.06.0 and (B) 5.50.9. The scoring of (L) 7.30.2 was problematic because of uncertainty about the status of the left-handed INDEX-If, but indications from the duration of AU 1, the duration of the AU 4y apex, and location of the body shift that it should be included in the rhetorical. If not included and analysis concerns WHY only, then the apex period of AU 1 does generally correspond to the period of the movement in WHY (which is then followed by a long hold).

Both of the facial signals in the remaining two examples appear to be influenced by other contiguous, facial/head signals. In (L) II 19.06.0, the rhetorical is preceded by a topic, #LEVESQUE. According to the self-analysis of a Deaf, native signer, it "feels natural" to lower the intensity of the brow raise after the topic in order to clearly distinguish it from the following rhetorical. She notes that if the 1+2 apex intensity were maintained during the rhetorical, it would have to be marked with particularly salient head/body movement.¹ In (B) 5.50.9, the

¹Using the same example, the informant moved both her head and body forward during OFF-POINT "WHAT" when she tried maintaining the brow raise intensity.

longest (6-sign) rhetorical in the data occurs and is immediately followed by a headnod which marks the subsequent assertion. According to the native signer mentioned above, the assertion could alternately have been marked by the presence of headnodding during C-O-N-T-R-A-C-T FOLLOW; however, the single, rapid nod after the rhetorical makes the assertion more definite or emphatic -- i.e. "they are really stuck with it". I suspect that anticipation of this nod accounts for the earlier apex offset.

8.3.4 Summary

Hypothesis 3 says we should expect the apex period of a linguistic, facial signal to co-occur with the period during which the manual signs in that linguistic unit are articulated. Discussion of the results presented in Figures 5.15 and 5.16 indicates that the apex onset of the question signals does generally co-occur with the onset of the first manual sign -- especially if the measure of manual onset is changed from "first full handshake" (Fig. 5.15) to something which refers to the beginning of contact or movement.¹

Discussion of the location of the facial, apex offset in these questions indicates that while some do exhibit the kind of simple terminal co-occurrence predicted in Hypothesis 3, others seem to be affected by such factors as Addressee overlap and the redundancy of final constituents, the pragmatic function of the question, and the presence of other contiguous facial signals.

¹This, of course, means the primary movement of the sign, not the transitional movement between signs.

Another prediction implied within Hypothesis 3 is that the facial actions in a linguistic signal will be visible on the face before the first handshake of the first sign is formed — which generally occurs enroute to the location of the sign. How early do these facial AUs appear before the manual onset? Does the activity on the face actually begin before any manual activity, including the activity of forming the first full handshake? If so, why?

On the average, the four signers in this sample took 2-4 fields (33-67 milliseconds) to form the handshake of a sign and rarely more than 5 fields (83 msec). So if we subtracted an average 3 fields from the recorded manual onset times, we would get some idea of when the manual behaviors actually started. Similarly, if we took the average difference between the facial AU onset and the recorded manual onset and then subtracted 3 fields from that number, we would get some idea of the temporal difference between the onset of facial behavior and the onset of manual behavior.

Figure 5.17 shows in the left column by how much the facial AUs precede the first sign onsets (determined by location of first full handshake). This is information available on the timelines. The right column averages were obtained by subtracting the number 3 from the left column averages to gain a ballpark estimate of the difference between facial and manual onsets.

	AU onset before sign onset			AU onset before manual onset	
	Average:		Range:	Average:	
	fields or msec.		fields	fields or msec.	
q	13	217	2-24	10	167
wh-q	7	117	1-15	4	67
rhet.q	10	167	4-17	7	117

Fig. 5.17 Differences between facial and manual onsets

Studies of nerve conduction velocity indicate that we should expect these differences in facial and manual onsets since the hands are located at a greater distance from the brain and because of the limitations of such joint movements (Basmajian, personal communication). Basmajian notes that the conduction time for most motor nerves is 50-60 meters per second. Since the distance from the brain to the hands on the average person is about 1 meter, we would expect initiation of manual activity about 60 milliseconds after the command message is sent. (This includes the few milliseconds added at various synaptic junctures, etc.) However, when a command is sent from the same cortex to the muscle at the corners of the mouth, the response time is only about 10-15 milliseconds. Presumably brow movements would have a similar latency.

That facial linguistic activity onsets before manual linguistic activity is, thus, a phenomenon determined by the mechanics of the body. The numbers quoted above yield an average 45-50 msec difference between the two onsets -- which is close to the wh question average reported in Figure 5.17 (allowing for 1-2 fields

error in the estimate of actual manual onset), but much smaller than the averages shown for yes-no and rhetorical questions. Is this difference due to the difference in brow actions (AU 4 vs 1+2)? Or is the message actually sent to the face before it is sent to the hands when the utterance is a yes-no or rhetorical question? Recalling that the 'q' and 'rhet.q' signals include head movement but that 'wh-q' does not (and that these head movements generally precede the sign onset, as reported in the next section), are these facts relevant?

Whether the language, ASL, actually shapes these differences or whether they are the result of other neuro-physical factors is a question for future research. However, the fact that the facial onset does precede the manual onset by about 50-160 milliseconds is significant for understanding how the language works. Studies of visual perception (Haber & Hershen 1965, Haber 1969, Rose 1974) show that individuals can recognize letters and words at 5 msec, and even at 1 msec with sufficient stimulus lighting. Thus, it is reasonable, on the basis of these facts and what we know about all the nonmanual signals described in Chapter 11, to assume that the Addressee in an ASL conversation is receiving and processing information about the syntactic value (and pragmatic function) of forthcoming utterances fairly continuously. This probably facilitates interpretation of the message as well as, perhaps, the rapid rate of information transmission (which I suspect, contrary to the findings of Bellugi & Fisher 1972¹, is faster than the rate

¹This study, never replicated, suffers from major methodological errors which reflect the limitations of state-of-the-art knowledge at that time, as the authors would probably confirm today.

of transmission for spoken languages like English). These are also questions for future research.

8.4 Head movements and manual signs in 'q' and 'rhet.q'

Hypothesis 4 makes predictions about the presence of head movements/positions and specified gaze direction during the period in which the manual signs in an utterance are produced.

Hypothesis 4

Movements of the head and/or eye gaze in a linguistic signal will co-occur in their simple onset, duration, and offset with (i.e. be present during) the simple onset, duration, and offset of the manual sign(s) in that linguistic unit.

To test the predictions of Hypothesis 4, we need to compare the onset and offset locations of head movements which are components of linguistic signals with the onset and offset locations of the corresponding manual strings. (As mentioned previously, eye gaze direction will not be described here since it is so predictable in the question data.) Figure 5.18 provides this comparison for the head behaviors in 'q' and 'rhet.q'.

	Head Onset @/before Sign Onset	Head Offset @/after Sign Offset
q	(N=11) 11	(N=11) 6
rhet.q	(N=12) 10	(N=12) 10

Fig. 5.18 Head movement locations in relation to lexical string onset/offset

Figure 5.18 shows that Hypothesis 14 is generally confirmed by the rhetorical question data, but that only its onset prediction is supported with the yes-no question data. Looking at the counterexamples in each category also leads to these conclusions. That is, the counterexamples in the rhetorical question data show the head onset/offset is still very close to, though not at, the sign onset/offset. However, the yes-no counterexamples for head offset range from 6 to 66 fields (offset before sign offset).

Recalling the previous discussion of actual facial and manual onsets, it may be useful to raise the same question for these head onsets in reference to the manual onsets. Figure 5.19 presents this comparison, using the same procedures described for Figure 5.17.

	Head onset before sign onset			Head onset before manual onset	
	Average:		Range:	Average:	
	fields or msec.		fields	fields or msec.	
q	7	117	0-18	4	67
rhet.q	6	100	0-14	3	50

Fig. 5.19 Differences between head and manual onsets

The difference reported in Figure 5.16 between AU onset and manual onset in the 'q' and 'rhet.q' data are, respectively, 167 msec and 117 msec. Comparing these numbers with the 67 msec and 50 msec results for the head behaviors in Figure 5.17 reveals that the head onsets are much closer to the manual onsets than are the facial onsets. In fact, recalling the calculations of nerve

conduction velocity in relation to the different distances of the head and hands from the brain, the results presented in Figure 5.17 strongly suggest that the linguistic messages examined here are sent from the brain to both "articulators" at the same time. Second, the relatively similar proximity of the facial musculature and pivot joint which controls head movements in relation to the brain but, in contrast, much earlier onset of some facial AUs suggests that neurophysical factors alone may not account for the large difference between these facial and manual onsets.¹

¹Basmajian has said that joint movements take longer than simple muscle movements (like in the face). However, the above reported differences still appear too great than can be accounted for by this mechanical difference.

Chapter VI

SUMMARY

In Chapter V, we found that the nonmanual syntactic signals of three types of questions are distinguishable from each other in terms of their component head and/or facial behaviors. The one observed exception to this generalization concerns rhetorical questions which ask yes-no questions. The signal accompanying these questions appears to have the same components as 'q', the signal for yes-no questions. However, there was not a sufficient number of such instances in the data to substantiate this claim.

We found evidence that the presence of Speaker emotion can affect the linguistic signal in at least two ways: it can change the intensity of a facial action (e.g. 'surprise' during yes-no questions), or it can actually change the components of the facial configuration (e.g. Speaker 'distress' during rhetorical questions). Evidence was found that the pragmatic function of an utterance can also alter the nonmanual signal. For example, the data on yes-no questions showed that AU 5 did not appear in infelicitous questions (except when Speaker surprise was also present). There were also examples suggesting that backward head movement will co-occur with wh questions which function like topics.¹

¹One tack not taken in this present analysis would be to distinguish only two types of questions, yes-no and wh questions, and then describe what happens when they function rhetorically in an utterance. This, of course, would then add to our evidence of how the pragmatic function of an utterance can alter its nonmanual signal.

We found that the facial actions in these signals tend to be at a medium ('y') level intensity, reserving the highest intensity level for other purposes, such as indicating the presence of affect or visually disambiguating one utterance from another which uses the same facial actions. (In some cases, such same-AU-signaled utterances were disambiguated by a change to a lower, x-level intensity.)

We found that the facial actions in each signal tend to increase rapidly to apex during their onset period but that the AUs in 'q' and 'wh-q' decrease to offset much more slowly. This rapid onset seems to facilitate effective transmission of the message while the slower offset may facilitate a smooth transition from the role of questioner to that of receiver of the response.

In trying to examine assumed differences between the facial actions which serve linguistic functions and those which express the Speaker's affective state, we ran into a major Achilles Heel: how do we know when a given facial action is expressing a "felt" emotion, or when it is being used to signal the presence of a emotion or to encourage a particular response from the Addressee? An initial examination of AU 12 smiles in the data raised the possibility that communication in a signed language like ASL may affect the spontaneous facial expression of emotions in ways different from the behavior of hearing conversants. The timing of such expressions in particular may be affected in order to accommodate the manual stream of behavior and the rule-governed co-occurrence of facial signals with it.

We found that component head behaviors are generally present during the apex of the facial actions, and that both actions (facial and head) usually begin before the onset of the first manual sign in the string. In fact, the facial actions are often at or close to apex when the first sign begins. However, the presence of facial actions at the end of the manual string seems to be strongly influenced by such factors as Addressee overlap and the redundancy of final constituents, the pragmatic function of the question, and the presence of other, contiguous facial signals.

A highly simplified generalization of the different location analyses is that first we see the face move, then the head, and then the hands. The earlier onset of the head in relation to the hands and the degree of difference between the two seems predictable from what we know about nerve conduction at varying distances from the brain. However, the much earlier than anticipated onset of some facial actions raises the possibility that the language has shaped this aspect of its transmission. Finally, we have observed that, whether by design or happenstance, these differences in the onsets of different channel behaviors in relation to their different linguistic roles work to the advantage of the language users in enabling both effective information processing and efficient message transmission.

REFERENCES

- Anthony, D. 1974. The Seeing Essential English Manual. Greeley, Colorado: Univ. of Northern Colorado, The University Bookstore. (first distributed in 1971)
- Baker, C. 1976a. What's not on the other hand in American Sign Language. Papers from the Twelfth Regional Meeting of the Chicago Linguistic Society. Chicago: University of Chicago Press.
- 1976b. Eye-openers in ASL. Sixth California Linguistic Association Conference Proceedings. San Diego State University, 1-13.
- 1977. Regulators and turn-taking in American Sign Language discourse. In L. Friedman (Ed.) On The Other Hand: New Perspectives on American Sign Language. New York: Academic Press, 215-236.
- 1978. Nonmanual behaviors in American Sign Language discourse. Grant proposal (with W. Stokoe) to the National Science Foundation.
- 1979. Nonmanual components of the sign language signal. Paper presented at the NATO Advanced Study Institute, Copenhagen, August.
- 1980a. How does "Sim-Com" fit into a bilingual approach to education? In F. Caccamise & D. Hicks (Eds.), 13-26.
- 1980b. Sentences in American Sign Language. In C. Baker & R. Battison (Eds.), 75-86.
- 1980c. On the terms "verbal" and "nonverbal". In I. Ahlgren & B. Bergman (Eds.) Papers From the First International Symposium on Sign Language Research, 41-52.
- and R. Battison (Eds.) 1980. Sign Language and the Deaf Community: essays in honor of William C. Stokoe. Silver Spring, MD: National Association of the Deaf.
- and D. Cokely. 1980. American Sign Language: a teacher's resource text on grammar and culture. Silver Spring, MD: T.J. Publishers, Inc.
- and D. Cokely. 1981. American Sign Language: a student text (units 10-18). Silver Spring, MD: T.J. Publishers, Inc.

- and C. Padden. 1978. Focusing on the nonmanual components of American Sign Language. In P. Siple (Ed.) Understanding Language Through Sign Language Research. New York: Academic Press, 27-57.
- Battison, R. 1978. Lexical Borrowing in American Sign Language. Silver Spring, MD: Linstok Press.
- Bell, A.G. 1884. Fallacies concerning the deaf. American Annals of the Deaf, 29, 1, 32-60.
- Bellugi, U. 1980. Formal devices for creating new signs in ASL. In Proceedings of the 1977 National Symposium on Sign Language Research and Teaching. Silver Spring, MD: National Association of the Deaf.
- and S. Fischer. 1972. A comparison of sign language and spoken language: rate and grammatical mechanisms. Cognition, 1, 173-200.
- Bender, R. 1970. The Conquest of Deafness. Cleveland: Case Western Reserve.
- Berthier, F. 1840. Les Sourds-Muets avant et depuis l'Abbé de l'Epée.... Paris: J. Ledoyen.
- Bienvenu, M.J. 1982. Interview: M.J. Bienvenu (by E. Beck). The Buff and Blue, March, 22-23. Reprinted in The Deaf American 1982, 34, 7, 13-16.
- Bornstein, H., L. Hamilton, K. Saulnier, and H. Roy. 1975. The Signed English Dictionary. Washington, D.C.: Gallaudet College Press.
- Brauer, B. 1980. The psychological evaluation of deaf adults. Paper presented at the Continuing Education Seminar on Deafness for the Mental Health Professional, Gallaudet College, December.
- Caccamise, F. and D. Hicks (Eds.) 1980. American Sign Language in a Bilingual, Bicultural Context: Proceedings of the 1978 National Symposium on Sign Language Research and Teaching. Silver Spring, MD: National Association of the Deaf.
- Chaves, T. & J. Soler. 1974. Pedro Ponce de Leon: first teacher of the deaf. Sign Language Studies, 5, 1, 48-63.
- Cokely, D. 1980. Sign Language: teaching, interpreting, and educational policy. In C. Baker & R. Battison (Eds.), 137-158.
- (Ed.) 1982. College level Sign Language programs: a resource list. The Reflector, 2, 15-16.

- . 1983. When is a pidgin not a pidgin? An alternative analysis of the ASL-English contact situation. Sign Language Studies, 38, 1-24.
- and C. Baker. 1980a. American Sign Language: a teacher's resource text on curriculum, methods, and evaluation. Silver Spring, MD: T.J. Publishers, Inc.
- and C. Baker. 1980b. American Sign Language: a student text (units 1-9). Silver Spring, MD: T.J. Publishers, Inc.
- and C. Baker. 1981. American Sign Language: a student text (units 19-27). Silver Spring, MD: T.J. Publishers, Inc.
- Coulter, G. 1979. American Sign Language Typology. Unpublished Ph.D. dissertation, Univ. of California, San Diego.
- . 1980. Raised eyebrows and wrinkled noses: the grammatical function of facial expression in relative clauses and related constructions. In F. Caccamise & D. Hicks (Eds.), 65-74.
- Craig, W. and H. Craig (Eds.) 1980. American Annals of the Deaf, Reference Issue, 125, 2, 179.
- Crandall, K. 1974. A Study of the Production of Chers and Related Sign Language Aspects by Deaf Children Between the Ages of Three and Seven Years. Unpublished Ph.D. dissertation, Northwestern University.
- Dalgarno, G. 1680. Didascopholus: or the Deaf and Dumb Man's Tutor. Oxford: Timothy Halton (reprinted in American Annals of the Deaf, 1857, 9, 14-64).
- Davies, S. 1983. The tongue is quicker than the eye: non-manual behaviors in ASL. Paper presented at the third International Symposium on Sign Language Research, Rome, June.
- Deland, F. 1931. The Story of Lipreading. Washington, D.C.: Volta Bureau.
- Doctor, D. (Ed.) 1962. Directory of services for the deaf. American Annals of the Deaf, 107.
- Ekman, P. 1976. Movements with precise meanings. Journal of Communication, 26, 3, 14-26.
- . In preparation. Liars and lie catchers.
- and W. Friesen. 1969. Origin, usage, and coding: the basis for five categories of nonverbal behavior. Semiotica, 1, 1, 49-98.

- and W. Friesen. 1975. Unmasking The Face. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- and W. Friesen. 1978a. Facial Action Coding System. Palo Alto, CA: Consulting Psychologists Press.
- and W. Friesen. 1978b. Facial Action Coding System: Investigators Guide. Palo Alto, CA: Consulting Psychologists Press.
- and W. Friesen. 1978c. Facial Action Coding System: Investigators Guide, Part Two. Palo Alto, CA: Consulting Psychologists Press.
- and W. Friesen. 1982. Felt, false, and miserable smiles. Journal of Nonverbal Behavior, 6, 4, Summer, 238-252.
- Fay, E.A. (Ed.) 1909. American Annals of the Deaf, 54, 38-47.
- Ferguson, C. 1959. Diglossia. Word, 15, 325-340.
- Fischer, S. 1973. Sign language and linguistic universals. Paper presented at the Colloque franco-allemand sur la grammaire transformationnelle du francais. In Rohrer & Ruwet (Eds.) 1974. Conference Proceedings. Tübingen: Max Niemeyer Verlag, 187-204.
- . 1975. Influences on word-order change in American Sign Language. In C. Li (Ed.) Word Order and Word Order Change. Austin: University of Texas Press, 1-25.
- Fishman, J. 1972. The Sociology of Language. Rowley, MA: Newburg House.
- Freeman, R., C. Carbin, and R. Boese. 1981. Can't Your Child Hear?. Baltimore, MD: University Park Press.
- Friedman, L. 1975. Space, time and person reference in American Sign Language. Language, 51, 940-961.
- . 1976. The manifestation of subject, object, and topic in American Sign Language. In C. Li (Ed.) Subject and Topic. New York: Academic Press, 125-148.
- and R. Battison. 1973. Phonological structures in American Sign Language. NEH Grant report AY-8218-73-136.
- Frishberg, N. 1975. Arbitrariness and iconicity: historical change in American Sign Language. Language, 51, 696-719.
- Gallaudet, E.M. 1868. Panel discussion on articulation. Proceedings of the National Conference of Principals of Institutions for the Deaf and Dumb. Washington, D.C., 60-90.

- . 1871. Is the sign language used to excess in teaching deaf mutes? American Annals of the Deaf, 16, 1, 26-33.
- . 1881. The Milan convention. American Annals of the Deaf, 26, 1-16.
- Garnett, C. 1968. The Exchange of Letters between Samuel Heinicke and Abbé Charles Michel de l'Epée, New York: Vantage Press.
- Gordon, J. 1885. Deaf mutes and the public schools from 1815 to the present day. American Annals of the Deaf, 30, 2, 121-143.
- Groce, N. 1980. Everyone spoke sign language here. Natural History, 89, 6, 10-16.
- Grosjean, F. 1980. Cross-linguistic research in the perception and production of English and American Sign Language. In F. Caccamise & D. Hicks (Eds.), 75-84.
- and H. Lane. 1977. Pauses and syntax in American Sign Language. Cognition, 5, 101-117.
- Gustason, G., D. Pfetzing, and E. Zawolkow. 1972. Signing Exact English. Rossmoor, California: Modern Signs Press.
- Haber, R. (Ed.) 1969. Information Processing Approaches to Visual Perception. New York: Holt, Rinehart & Winston.
- and M. Hershen. 1965. Effects of repeated brief exposures on the growth of a percept. Journal of Experimental Psychology, 69, 40-46.
- Hockett, C. 1963. The problem of universals of language. In J. Greenberg (Ed.) Universals of Language. Cambridge, MA: MIT Press, 1-29.
- Itard, J.M. 1821. Traite des maladies de l'oreille et de l'audition. Paris: Méquignon-Marvis.
- . 1827. Notes. In J.C. Hoffbauer. Médecine legale relative aux aliénés et aux sourds-muets.
- Jaffe, J. and S. Feldstein. 1970. Rhythms of Dialogue. New York: Academic Press.
- Johnson, R. and C. Erting. 1982. Linguistic socialization in the context of emergent deaf ethnicity. Paper presented at the National Research Conference on the Social Aspects of Deafness, Gallaudet College, June.
- Jones, J. 1918. One hundred years of history in the education of the deaf in America and its present status. American Annals of the Deaf, 63, 1, 1-43.

- Jordan, I.K., G. Gustason, and R. Rosen. 1976. Current communication trends at programs for the deaf. American Annals of the Deaf, 121, 5, 527-531.
- . 1979. An update on communication trends at programs for the deaf. American Annals of the Deaf, 125, 3, 350-357.
- Kannapell, B. 1980. Personal awareness and advocacy in the deaf community. In C. Baker & R. Battison (Eds.), 105-116.
- Karchmer, M., R. Trybus, and M. Pacquin. 1978. Early manual communication, parental hearing status, and the academic achievement of deaf students. Paper presented at the American Educational Research Association Annual Meeting, Toronto.
- Kendon, A. 1967. Some functions of gaze direction in social interaction. Acta Psychologica, 26, 22-63.
- Kluwin, T. 1981. The grammaticality of manual representations of English in classroom settings. American Annals of the Deaf, June, 417-421.
- Koneya, M. 1981. Unresolved theoretical issues in nonverbal communication. Semiotica, 37, 1/2, 1-14.
- Lacy, R. 1974. Putting some of the syntax back into semantics. ms, Dept. of Linguistics, Univ. of California, San Diego.
- Lane, H. 1976. The Wild Boy of Aveyron. Cambridge, MA: Harvard University Press.
- . 1977. Notes for a psycho-history of American Sign Language. The Deaf American, September, 3-7.
- . 1980. Some thoughts on language bigotry. Address given on Professional Day at Gallaudet College, Washington, D.C.
- Lawson, L. 1983. Multi-channel signs. In J. Kyle & B. Woll (Eds.) Language In Sign: an international perspective on sign language. London: Croom Helm, 97-105.
- Liddell, S. 1977. An Investigation into the Syntactic Structure of American Sign Language. Ph.D. dissertation, University of California, San Diego. Published in 1980. American Sign Language Syntax. The Hague: Mouton.
- Long, J.S. 1918. The Sign Language: a manual of signs. Washington, D.C.: Gallaudet College Press.
- Markowicz, H. 1972. Some sociolinguistic considerations of American Sign Language. Sign Language Studies, 1, 15-41.

- . 1977-78. Educational goals and the deaf image. Teaching English to the Deaf, 4, 3, 11-15.
- and J. Woodward. 1978. Language and the maintenance of ethnic boundaries in the deaf community. Communication and Cognition 11, 1, 29-38.
- Marmor, G. and L. Petitto. 1979. Simultaneous communication in the classroom: how grammatical is it?. Sign Language Studies, 23, 99-136.
- McIntire, M. 1980. Locatives in American Sign Language. Unpublished Ph.D. dissertation, Univ. of California, Los Angeles.
- Meadow, K. 1968. Early manual communication in relation to the deaf child's intellectual, social, and communicative functioning. American Annals of the Deaf, 113, 1, 29-41.
- . 1972. Sociolinguistics, sign language, and the deaf subculture. In T.J. O'Rourke (Ed.) Psycholinguistics and Total Communication: the State of the Art. Washington, D.C.: American Annals of the Deaf, 19-33.
- Moore, D. 1970. Evaluation of preschool programs. Proceedings of the International Congress on Education of the Deaf. Stockholm, 1964-1968.
- . 1982. Educating the Deaf, Second Edition. Boston, MA: Houghton Mifflin Co.
- Padden, C. 1980. The deaf community and the culture of deaf people. In C. Baker & R. Battison (Eds.), 89-103.
- and H. Markowicz. 1976. Cultural conflicts between hearing and deaf communities. In F.B. & A.B. Crammatte (Eds.) Proceedings of the VII World Congress of the World Federation of the Deaf. Washington, D.C.: National Association of the Deaf, 407-412.
- Peet, H. 1851. Memoir on the origin and early history of the art of teaching the deaf and dumb. American Annals of the Deaf, 4, 2, 129-161.
- Rae, L. 1852. Dr. Peet's European tour. American Annals of the Deaf, 4, 243-252.
- Rainer, J., K. Altshuler, and F. Kallman (Eds.) 1963. Family and Mental Health Problems in a Deaf Population. New York: New York State Psychiatric Institute, Columbia University Press.
- Reilly, J. and M. McIntire. 1980. American Sign Language and Pidgin Sign English: what's the difference? Sign Language Studies, 27, 151-192.

- Rittenhouse, R. and R. Spiro. 1979. Conservation-interrogation of deaf and normal hearing children. Journal of Childhood Communication Disorders, 3, 2, 120-127.
- Rose, A. 1974. Human Information Processing: an assessment and research battery. Unpublished Ph.D. dissertation, Univ. of Michigan.
- Rosenthal, R. and L. Jacobson. 1968. Pygmalion in the Classroom. New York: Holt, Rinehart and Winston.
- Sachs, B. 1977. Psychological assessment of the deaf person. Mental Health in Deafness, 1, 93-95.
- Schein, J. and M. Delk. 1974. The Deaf Population of the United States. Silver Spring, MD: National Association of the Deaf.
- Scherer, K. 1975. Vocal emblems. Paper presented at the Semiotics Kolloquium, Berlin.
- Schreiber, F. 1974-75. And the cons. Gallaudet Today, Winter, 5-6.
- , 1977. Mental health needs of deaf adults. Mental Health in Deafness, 1, 79-81.
- Sequin, E. 1876. Medical Thermometry and Human Temperature. New York: William Wood.
- Sicard, R.A. 1800. Cours d'instruction d'un sourd-muet de naissance, Paris: Le Clere.
- Silverman, S.R. 1972. The education of deaf children. In L. Travis (Ed.) Handbook of Speech Pathology and Audiology. New York: Appleton-Century-Crofts, 399-430.
- Siple, P. 1978. Visual constraints for sign language communication. Sign Language Studies, 19, 95-110.
- Smith, W. 1977. A study of nonmanual signals in Taiwan Sign Language. ms, Anthropology, California State University at Northridge, 32pp.
- Stevens, R. 1980. Education in schools for deaf children. In C. Baker & R. Battison (Eds.), 177-191.
- Stevenson, E. 1964. A study of the educational achievement of deaf children of deaf parents. The California News, 80, 1-3.
- Stokoe, W. 1960. Sign Language Structure: An Outline of the Visual Communication Systems of the American Deaf. University of Buffalo, Occasional Papers 8. [Revised 1978, Silver Spring, MD: Linstok Press]

- , 1970. Sign language diglossia. Studies in Linguistics, 21, 27-41.
- , 1972. Semiotics and Human Sign Languages. The Hague: Mouton.
- , 1980. Afterword. In C. Baker & R. Battison (Eds.), 265-267.
- , D. Casterline, and C. Croneberg. 1965. A Dictionary of American Sign Language on Linguistic Principles. Washington, D.C.: Gallaudet College Press. Second Edition, Silver Spring, MD: Linstok Press, 1976.
- Stuckless, E.R. and J. Birch. 1966. The influence of early manual communication on the linguistic development of deaf children. American Annals of the Deaf, 111, 2, 452-460, 3, 499-504.
- Sullivan, P. and M. Vernon. 1979. Psychological assessment of hearing impaired children. School Psychology Digest, 8, 4, 271-290.
- Supalla, T. 1980. Morphology of verbs of motion and location in American Sign Language. In F. Caccamise & D. Hicks (Eds.), 27-45.
- , 1982. Structure and Acquisition of Verbs of Motion and Location in American Sign Language. Unpublished Ph.D. dissertation, Univ. of California, San Diego.
- and E. Newport. 1978. How many seats in a chair? The derivation of nouns and verbs in American Sign Language. In P. Siple (Ed.) Understanding Language Through Sign Language Research. New York: Academic Press, 91-132.
- Sussman, A. 1976. Attitudes toward deafness: psychology's role, past, present and potential. In F.B. & A.B. Crammatte (Eds.) VII World Congress of the World Federation of the Deaf. Silver Spring, MD: National Association of the Deaf, 254-258.
- Tomkins, S. 1975. The phantasy behind the face. Journal of Personality Assessment, 39, 6, 551-562.
- Trybus, R. 1980. Sign Language, power, and mental health. In C. Baker & R. Battison (Eds.), 201-217.
- and C. Jensema 1978. Communication patterns and educational achievement of hearing impaired students. Office of Demographic Studies, series T, No. 2, Washington, D.C.: Gallaudet College.
- van Uden, A. 1968. A Word of Language for Deaf Children, Part I: Basic Principles. St. Michielsgestel, The Netherlands: Rotterdam University Press.

- Veditz, G. 1913. The Preservation of Sign Language. Film made by the National Association of the Deaf (available on videotape from the Gallaudet College Library).
- Vernon, M. and S. Koh. 1970. Effects of manual communication on deaf children's education achievement, linguistic competence, oral skills, and psychological development. American Annals of the Deaf, 115, 5, 527-536.
- Vogt-Svendsen, M. 1981. Mouth position and mouth movement in Norwegian Sign Language. Sign Language Studies, 33, 363-376.
- . 1983. Norske Døves Tegnspråk. Trondheim: Tapir.
- Walker, B. and H. Pearson. 1979. Signfest: Teacher Resource Manual. Washington, D.C.: Model Secondary School for the Deaf.
- Wampler, D. 1972. Linguistics of Visual English. Linguistics of Visual English, 2322 Maher Drive, No. 35, Santa Rosa, California 94505 (booklets).
- Washabaugh, W. 1981. Sign language in its social context. Annual Review of Anthropology, 10, 237-252.
- , W. Woodward, and S. DeSantis. 1976. Providence Island Sign Language. Paper presented at the Annual Meeting of the Linguistic Society of America, Philadelphia, December.
- Woodward, J. 1972. Implications for sociolinguistic research among the deaf. Sign Language Studies, 1, 1-7.
- . 1973. Implicational lects on the deaf diglossic continuum. Unpublished Ph.D. dissertation, Georgetown University.
- . 1975. How you gonna get to heaven if you can't talk with Jesus: the educational establishment vs. the deaf community. Paper presented at the Society for Applied Anthropology meeting, Amsterdam, March.
- . 1978. Historical bases of American Sign Language. In P. Siple (Ed.) Understanding Language Through Sign Language Research. New York: Academic Press, 333-348.
- . 1980. Some sociolinguistic problems in the implementation of bilingual education for deaf students. In F. Caccamise & D. Hicks (Eds.), 183-209.
- and S. DeSantis, in preparation. Towards A Phonological Dictionary of Providence Island Sign Language.
- and C. Erting. 1975. Synchronic variation and historical change in American Sign Language. Language Sciences, 37, 9-12.

Appendix A: DATA TIMELINES

The data timelines are ordered by dyad and temporal sequence. Segments from the male-male dyad appear first, followed by segments from the female-female dyad. Within each dyad, the segments are ordered according to their position on the videotape - e.g. 0.16.2 before 2.12.2. Segments which are marked "Part II" appear in the second half of the videotape and are sequenced after the segments not so marked - e.g. Pt. II 0.43.4 after 14.50.1.

To read segments which are transcribed on more than one sheet of paper will require lining up the pages in exact sequence, following the videofield numbers at the top of the timeline. This is necessary since the AU numbers appear only on the first page left-hand column (and because the cost of continuous roll printing is too prohibitive).

Contextual information necessary for understanding the segments and their translations can be found in Appendix B.

[illegible]

247	242	245	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697
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13101 13102 13103 13104 13105 13106 13107 13108 13109 13110 13111 13112 13113 13114 13115 13116 13117 13118 13119 13120 13121 13122 13123 13124 13125 13126 13127 13128 13129 13130 13131 13132 13133 13134 13135 13136 13137 13138 13139 13140 13141 13142 13143 13144 13145 13146 13147 13148 13149 13150 13151 13152 13153 13154 13155 13156 13157 13158 13159 13160 13161 13162 13163 13164 13165 13166 13167 13168 13169 13170 13171 13172 13173 13174 13175 13176 13177 13178 13179 13180 13181 13182 13183 13184 13185 13186 13187 13188 13189 13190 13191 13192 13193 13194 13195 13196 13197 13198 13199 13200

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[illegible]

[illegible]

—Tl— FOLLOW—
their [Union] contract.

SUBJECT: LARRY
 BEGIN = 5:58:0 END = 6:02:16
 25946

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 100

Eye/Gaze (4)
 Head/Body
 Hands
 Translation

TRUE WANT DISMISS
 Really, they want to lay off [many more] leaving only three.

THREE
 (hand) (four-fret)

THREE
 (hand)

REASON
 Why? Because the

[illegible][illegible]

SUBJECT: LARRY
 BEGIN * 7.30.2 END * 7.36.5
 31314 31697

1 31118 31324 31328 31348 31354 31372 31396 31402 31418 31428 31438 31448 31458

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25

26

32

41

44

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R45 310

EYE GAZE (P) 317 331

Head/Body (Left/Right) 328

Hands down WHY 318 320

Translation They can't! Why? Well, for example, Washington doesn't have its own stadium.

Brian NOW + + + +

314 316 318 320 322 324 326 328 330 332 334 336 338 340 342 344 346 348 350 352 354 356 358 360 362 364 366 368 370 372 374 376 378 380 382 384 386 388 390 392 394 396 398 400

Begin shaking (8 beats)

DOWN FOOTBALL CHY-CL arena

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SUBJECT: LARRY
 BEGIN = 91002
 3195 3196

37198 37208 37218 37228 37238 37248 37258 37268 37278 37288 37298 37308 37318 37328 37338 37348

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294

Eye Gaze (+)

Head/Body

Hands

Translation

Now

WASHINGTON

What Pass (n)

Index-It

Why? He says it's because he's playing with

37340	37350	37360	37370	37380	37390	37400	37410	37420	37430	37440	37450	37460	37470	37480	37490	37500
WITH GOOD TEAM That makes him play better. PLAY IF high lower to wait BETTER WELL So... In the																

37505 37516 37526 37536 37546 37556 37566 37576 37586 37596 37606 37616 37626 37636 37646 37656 37666 37676 37686 37696 37706 37716 37726 37736 37746 37756 37766 37776 37786 37796 37806 37816 37826 37836 37846 37856 37866 37876 37886 37896 37906 37916 37926 37936 37946 37956 37966 37976 37986 37996 38006 38016 38026 38036 38046 38056 38066 38076 38086 38096 38106 38116 38126 38136 38146 38156 38166 38176 38186 38196 38206 38216 38226 38236 38246 38256 38266 38276 38286 38296 38306 38316 38326 38336 38346 38356 38366 38376 38386 38396 38406 38416 38426 38436 38446 38456 38466 38476 38486 38496 38506 38516 38526 38536 38546 38556 38566 38576 38586 38596 38606 38616 38626 38636 38646 38656 38666 38676 38686 38696 38706 38716 38726 38736 38746 38756 38766 38776 38786 38796 38806 38816 38826 38836 38846 38856 38866 38876 38886 38896 38906 38916 38926 38936 38946 38956 38966 38976 38986 38996 39006 39016 39026 39036 39046 39056 39066 39076 39086 39096 39106 39116 39126 39136 39146 39156 39166 39176 39186 39196 39206 39216 39226 39236 39246 39256 39266 39276 39286 39296 39306 39316 39326 39336 39346 39356 39366 39376 39386 39396 39406 39416 39426 39436 39446 39456 39466 39476 39486 39496 39506 39516 39526 39536 39546 39556 39566 39576 39586 39596 39606 39616 39626 39636 39646 39656 39666 39676 39686 39696 39706 39716 39726 39736 39746 39756 39766 39776 39786 39796 39806 39816 39826 39836 39846 39856 39866 39876 39886 39896 39906 39916 39926 39936 39946 39956 39966 39976 39986 39996 40006 40016 40026 40036 40046 40056 40066 40076 40086 40096 40106 40116 40126 40136 40146 40156 40166 40176 40186 40196 40206 40216 40226 40236 40246 40256 40266 40276 40286 40296 40306 40316 40326 40336 40346 40356 40366 40376 40386 40396 40406 40416 40426 40436 40446 40456 40466 40476 40486 40496 40506 40516 40526 40536 40546 40556 40566 40576 40586 40596 40606 40616 40626 40636 40646 40656 40666 40676 40686 40696 40706 40716 40726 40736 40746 40756 40766 40776 40786 40796 40806 40816 40826 40836 40846 40856 40866 40876 40886 40896 40906 40916 40926 40936 40946 40956 40966 40976 40986 40996 41006 41016 41026 41036 41046 41056 41066 41076 41086 41096 41106 41116 41126 41136 41146 41156 41166 41176 41186 41196 41206 41216 41226 41236 41246 41256 41266 41276 41286 41296 41306 41316 41326 41336 41346 41356 41366 41376 41386 41396 41406 41416 41426 41436 41446 41456 41466 41476 41486 41496 41506 41516 41526 41536 41546 41556 41566 41576 41586 41596 41606 41616 41626 41636 41646 41656 41666 41676 41686 41696 41706 41716 41726 41736 41746 41756 41766 41776 41786 41796 41806 41816 41826 41836 41846 41856 41866 41876 41886 41896 41906 41916 41926 41936 41946 41956 41966 41976 41986 41996 42006 42016 42026 42036 42046 42056 42066 42076 42086 42096 42106 42116 42126 42136 42146 42156 42166 42176 42186 42196 42206 42216 42226 42236 42246 42256 42266 42276 42286 42296 42306 42316 42326 42336 42346 42356 42366 42376 42386 42396 42406 42416 42426 42436 42446 42456 42466 42476 42486 42496 42506 42516 42526 42536 42546 42556 42566 42576 42586 42596 42606 42616 42626 42636 42646 42656 42666 42676 42686 42696 42706 42716 42726 42736 42746 42756 42766 42776 42786 42796 42806 42816 42826 42836 42846 42856 42866 42876 42886 42896 42906 42916 42926 42936 42946 42956 42966 42976 42986 42996 43006 43016 43026 43036 43046 43056 43066 43076 43086 43096 43106 43116 43126 43136 43146 43156 43166 43176 43186 43196 43206 43216 43226 43236 43246 43256 43266 43276 43286 43296 43306 43316 43326 43336 43346 43356 43366 43376 43386 43396 43406 43416 43426 43436 43446 43456 43466 43476 43486 43496 43506 43516 43526 43536 43546 43556 43566 43576 43586 43596 43606 43616 43626 43636 43646 43656 43666 43676 43686 43696 43706 43716 43726 43736 43746 43756 43766 43776 43786 43796 43806 43816 43826 43836 43846 43856 43866 43876 43886 43896 43906 43916 43926 43936 43946 43956 43966 43976 43986 43996 44006 44016 44026 44036 44046 44056 44066 44076 44086 44096 44106 44116 44126 44136 44146 44156 44166 44176 44186 44196 44206 44216 44226 44236 44246 44256 44266 44276 44286 44296 44306 44316 44

why? He says it's because he's playin

15698 15699 15700 15701 15702 15703 15704 15705 15706 15707 15708 15709 15710 15711 15712 15713 15714 15715 15716 15717 15718 15719 15720 15721 15722 15723 15724 15725 15726 15727 15728 15729 15730 15731 15732 15733 15734 15735 15736 15737 15738 15739 15740 15741 15742 15743 15744 15745 15746 15747 15748 15749 15750 15751 15752 15753 15754 15755 15756 15757 15758 15759 15760 15761 15762 15763 15764 15765 15766 15767 15768 15769 15770 15771 15772 15773 15774 15775 15776 15777 15778 15779 15780 15781 15782 15783 15784 15785 15786 15787 15788 15789 15790 15791 15792 15793 15794 15795 15796 15797 15798 15799 15800 15801 15802 15803 15804 15805 15806 15807 15808 15809 15810 15811 15812 15813 15814 15815 15816 15817 15818 15819 15820 15821 15822 15823 15824 15825 15826 15827 15828 15829 15830 15831 15832 15833 15834 15835 15836 15837 15838 15839 15840 15841 15842 15843 15844 15845 15846 15847 15848 15849 15850 15851 15852 15853 15854 15855 15856 15857 15858 15859 15860 15861 15862 15863 15864 15865 15866 15867 15868 15869 15870 15871 15872 15873 15874 15875 15876 15877 15878 15879 15880 15881 15882 15883 15884 15885 15886 15887 15888 15889 15890 15891 15892 15893 15894 15895 15896 15897 15898 15899 15900 15901 15902 15903 15904 15905 15906 15907 15908 15909 15910 15911 15912 15913 15914 15915 15916 15917 15918 15919 15920 15921 15922 15923 15924 15925 15926 15927 15928 15929 15930 15931 15932 15933 15934 15935 15936 15937 15938 15939 15940 15941 15942 15943 15944 15945 15946 15947 15948 15949 15950 15951 15952 15953 15954 15955 15956 15957 15958 15959 15960 15961 15962 15963 15964 15965 15966 15967 15968 15969 15970 15971 15972 15973 15974 15975 15976 15977 15978 15979 15980 15981 15982 15983 15984 15985 15986 15987 15988 15989 15990 15991 15992 15993 15994 15995 15996 15997 15998 15999 16000

301

WITH GOOD TEAM
 lying with a good team.
 (2) INDEX (1) - AT PLAY - BETTER
 That makes him play better.
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SECRET: LEGAL
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 Eye Gaze (+)
 Head/Body (return from body lean rt)
 Hands (will in conversation) leftest
 Translation
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715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	

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(Hand blocks 223-225)

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<<<<<YYYYYY.YYYYYY>>>

[illegible]

017

017

200

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178

$$E - A - M$$

---(2h)alt. GET---

SSad

—7WO—

50W

ST

HEARING—

Who's he getting?

His two sons - who are hearing.

(Return to lap)

SUBJECT: LARRY, P. II  
 BEGIN \* 8259 END \* 8259  
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Eye Gaze (+)  
 Head Body  
 Hands (both resting in lap)  
 Translation  
 Brian ... "WELL" NOW SAY #WILL (assimilated) Hey, you said MEETING decide SATURDAY (ALL) MORNING "JF"  
 Translation So they say there's gonna be a meeting to decide on that tonight and -

[illegible]







[illegible]

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86630 86640 86650 86660 86670 86680 86690 86700 86710 86720 86730 86740 86750 86760 86770 86780 86790 86800 86810 86820 86830 86840 86850 86860 86870 86880 86890 86900 86910 86920 86930 86940 86950 86960 86970 86980 86990 87000

87010 87020 87030 87040 87050 87060 87070 87080 87090 87100 87110 87120 87130 87140 87150 87160 87170 87180 87190 87200 87210 87220 87230 87240 87250 87260 87270 87280 87290 87300 87310 87320 87330 87340 87350 87360 87370 87380 87390 87400 87410 87420 87430 87440 87450 87460 87470 87480 87490 87500 87510 87520 87530 87540 87550 87560 87570 87580 87590 87600 87610 87620 87630 87640 87650 87660 87670 87680 87690 87700 87710 87720 87730 87740 87750 87760 87770 87780 87790 87800 87810 87820 87830 87840 87850 87860 87870 87880 87890 87900 87910 87920 87930 87940 87950 87960 87970 87980 87990 88000

88010 88020 88030 88040 88050 88060 88070 88080 88090 88100 88110 88120 88130 88140 88150 88160 88170 88180 88190 88200 88210 88220 88230 88240 88250 88260 88270 88280 88290 88300 88310 88320 88330 88340 88350 88360 88370 88380 88390 88400 88410 88420 88430 88440 88450 88460 88470 88480 88490 88500 88510 88520 88530 88540 88550 88560 88570 88580 88590 88600 88610 88620 88630 88640 88650 88660 88670 88680 88690 88700 88710 88720 88730 88740 88750 88760 88770 88780 88790 88800 88810 88820 88830 88840 88850 88860 88870 88880 88890 88900 88910 88920 88930 88940 88950 88960 88970 88980 88990 89000

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90010 90020 90030 90040 90050 90060 90070 90080 90090 90100 90110 90120 90130 90140 90150 90160 90170 90180 90190 90200 90210 90220 90230 90240 90250 90260 90270 90280 90290 90300 90310 90320 90330 90340 90350 90360 90370 90380 90390 90400 90410 90420 90430 90440 90450 90460 90470 90480 90490 90500 90510 90520 90530 90540 90550 90560 90570 90580 90590 90600 90610 90620 90630 90640 90650 90660 90670 90680 90690 90700 90710 90720 90730 90740 90750 90760 90770 90780 90790 90800 90810 90820 90830 90840 90850 90860 90870 90880 90890 90900 90910 90920 90930 90940 90950 90960 90970 90980 90990 91000

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92010 92020 92030 92040 92050 92060 92070 92080 92090 92100 92110 92120 92130 92140 92150 92160 92170 92180 92190 92200 92210 92220 92230 92240 92250 92260 92270 92280 92290 92300 92310 92320 92330 92340 92350 92360 92370 92380 92390 92400 92410 92420 92430 92440 92450 92460 92470 92480 92490 92500 92510 92520 92530 92540 92550 92560 92570 92580 92590 92600 92610 92620 92630 92640 92650 92660 92670 92680 92690 92700 92710 92720 92730 92740 92750 92760 92770 92780 92790 92800 92810 92820 92830 92840 92850 92860 92870 92880 92890 92900 92910 92920 92930 92940 92950 92960 92970 92980 92990 93000

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**Conclusions**

<<XXXXX>

[illegible][illegible]

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| 141 | 651 | (+) |
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63  
(Return)

SIGN-PAPER THREE YEAR

ed [a contract with Rivdale?]. Did you get [the field]?  
SIGN-PAPER FINISH GET  
Oh yeah. I just found out that the contract  
wasn't signed.



92284 92293 92302 92311 92320 92329 92338 92347 92356 92365 92374 92383 92392 92401 92410 92419 92428 92437 92446 92455 92464 92473 92482 92491 92500 92509 92518 92527 92536 92545 92554 92563 92572 92581 92590 92599 92608 92617 92626 92635 92644 92653 92662 92671 92680 92689 92698 92707 92716 92725 92734 92743 92752 92761 92770 92779 92788 92797 92806 92815 92824 92833 92842 92851 92860 92869 92878 92887 92896 92905 92914 92923 92932 92941 92950 92959 92968 92977 92986 92995 93004 93013 93022 93031 93040 93049 93058 93067 93076 93085 93094 93103 93112 93121 93130 93139 93148 93157 93166 93175 93184 93193 93202 93211 93220 93229 93238 93247 93256 93265 93274 93283 93292 93301 93310 93319 93328 93337 93346 93355 93364 93373 93382 93391 93400 93409 93418 93427 93436 93445 93454 93463 93472 93481 93490 93499 93508 93517 93526 93535 93544 93553 93562 93571 93580 93589 93598 93607 93616 93625 93634 93643 93652 93661 93670 93679 93688 93697 93706 93715 93724 93733 93742 93751 93760 93769 93778 93787 93796 93805 93814 93823 93832 93841 93850 93859 93868 93877 93886 93895 93904 93913 93922 93931 93940 93949 93958 93967 93976 93985 93994 94003 94012 94021 94030 94039 94048 94057 94066 94075 94084 94093 94102 94111 94120 94129 94138 94147 94156 94165 94174 94183 94192 94201 94210 94219 94228 94237 94246 94255 94264 94273 94282 94291 94300 94309 94318 94327 94336 94345 94354 94363 94372 94381 94390 94399 94408 94417 94426 94435 94444 94453 94462 94471 94480 94489 94498 94507 94516 94525 94534 94543 94552 94561 94570 94579 94588 94597 94606 94615 94624 94633 94642 94651 94660 94669 94678 94687 94696 94705 94714 94723 94732 94741 94750 94759 94768 94777 94786 94795 94804 94813 94822 94831 94840 94849 94858 94867 94876 94885 94894 94903 94912 94921 94930 94939 94948 94957 94966 94975 94984 94993 95002 95011 95020 95029 95038 95047 95056 95065 95074 95083 95092 95101 95110 95119 95128 95137 95146 95155 95164 95173 95182 95191 95200 95209 95218 95227 95236 95245 95254 95263 95272 95281 95290 95299 95308 95317 95326 95335 95344 95353 95362 95371 95380 95389 95398 95407 95416 95425 95434 95443 95452 95461 95470 95479 95488 95497 95506 95515 95524 95533 95542 95551 95560 95569 95578 95587 95596 95605 95614 95623 95632 95641 95650 95659 95668 95677 95686 95695 95704 95713 95722 95731 95740 95749 95758 95767 95776 95785 95794 95803 95812 95821 95830 95839 95848 95857 95866 95875 95884 95893 95902 95911 95920 95929 95938 95947 95956 95965 95974 95983 95992 96001 96010 96019 96028 96037 96046 96055 96064 96073 96082 96091 96100 96109 96118 96127 96136 96145 96154 96163 96172 96181 96190 96200 96209 96218 96227 96236 96245 96254 96263 96272 96281 96290 96300 96309 96318 96327 96336 96345 96354 96363 96372 96381 96390 96400 96409 96418 96427 96436 96445 96454 96463 96472 96481 96490 96500 96509 96518 96527 96536 96545 96554 96563 96572 96581 96590 96600 96609 96618 96627 96636 96645 96654 96663 96672 96681 96690 96700 96709 96718 96727 96736 96745 96754 96763 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SUBJECT: LARRY PT. II 5.06.9  
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|-----------------|-------|--------------|-------|-------|-------|-------|-------|
| SUBJECT - HANNA |       | END - 0.44.8 |       | 5421  |       | 5431  |       |
| BEGIN - 0.33.1  |       | 5440         |       | 5401  |       | 5411  |       |
| 1               | 5301  | 5311         | 5321  | 5331  | 5341  | 5351  | 5361  |
| 2               | 5371  | 5381         | 5391  | 5401  | 5411  | 5421  | 5431  |
| 3               | 5441  | 5451         | 5461  | 5471  | 5481  | 5491  | 5501  |
| 4               | 5511  | 5521         | 5531  | 5541  | 5551  | 5561  | 5571  |
| 5               | 5581  | 5591         | 5601  | 5611  | 5621  | 5631  | 5641  |
| 6               | 5651  | 5661         | 5671  | 5681  | 5691  | 5701  | 5711  |
| 7               | 5721  | 5731         | 5741  | 5751  | 5761  | 5771  | 5781  |
| 8               | 5791  | 5801         | 5811  | 5821  | 5831  | 5841  | 5851  |
| 9               | 5861  | 5871         | 5881  | 5891  | 5901  | 5911  | 5921  |
| 10              | 5931  | 5941         | 5951  | 5961  | 5971  | 5981  | 5991  |
| 11              | 6001  | 6011         | 6021  | 6031  | 6041  | 6051  | 6061  |
| 12              | 6071  | 6081         | 6091  | 6101  | 6111  | 6121  | 6131  |
| 13              | 6141  | 6151         | 6161  | 6171  | 6181  | 6191  | 6201  |
| 14              | 6211  | 6221         | 6231  | 6241  | 6251  | 6261  | 6271  |
| 15              | 6281  | 6291         | 6301  | 6311  | 6321  | 6331  | 6341  |
| 16              | 6351  | 6361         | 6371  | 6381  | 6391  | 6401  | 6411  |
| 17              | 6421  | 6431         | 6441  | 6451  | 6461  | 6471  | 6481  |
| 18              | 6491  | 6501         | 6511  | 6521  | 6531  | 6541  | 6551  |
| 19              | 6561  | 6571         | 6581  | 6591  | 6601  | 6611  | 6621  |
| 20              | 6631  | 6641         | 6651  | 6661  | 6671  | 6681  | 6691  |
| 21              | 6701  | 6711         | 6721  | 6731  | 6741  | 6751  | 6761  |
| 22              | 6771  | 6781         | 6791  | 6801  | 6811  | 6821  | 6831  |
| 23              | 6841  | 6851         | 6861  | 6871  | 6881  | 6891  | 6901  |
| 24              | 6911  | 6921         | 6931  | 6941  | 6951  | 6961  | 6971  |
| 25              | 6981  | 6991         | 7001  | 7011  | 7021  | 7031  | 7041  |
| 26              | 7051  | 7061         | 7071  | 7081  | 7091  | 7101  | 7111  |
| 27              | 7121  | 7131         | 7141  | 7151  | 7161  | 7171  | 7181  |
| 28              | 7191  | 7201         | 7211  | 7221  | 7231  | 7241  | 7251  |
| 29              | 7261  | 7271         | 7281  | 7291  | 7301  | 7311  | 7321  |
| 30              | 7331  | 7341         | 7351  | 7361  | 7371  | 7381  | 7391  |
| 31              | 7401  | 7411         | 7421  | 7431  | 7441  | 7451  | 7461  |
| 32              | 7471  | 7481         | 7491  | 7501  | 7511  | 7521  | 7531  |
| 33              | 7541  | 7551         | 7561  | 7571  | 7581  | 7591  | 7601  |
| 34              | 7611  | 7621         | 7631  | 7641  | 7651  | 7661  | 7671  |
| 35              | 7681  | 7691         | 7701  | 7711  | 7721  | 7731  | 7741  |
| 36              | 7751  | 7761         | 7771  | 7781  | 7791  | 7801  | 7811  |
| 37              | 7821  | 7831         | 7841  | 7851  | 7861  | 7871  | 7881  |
| 38              | 7891  | 7901         | 7911  | 7921  | 7931  | 7941  | 7951  |
| 39              | 7961  | 7971         | 7981  | 7991  | 8001  | 8011  | 8021  |
| 40              | 8031  | 8041         | 8051  | 8061  | 8071  | 8081  | 8091  |
| 41              | 8101  | 8111         | 8121  | 8131  | 8141  | 8151  | 8161  |
| 42              | 8171  | 8181         | 8191  | 8201  | 8211  | 8221  | 8231  |
| 43              | 8241  | 8251         | 8261  | 8271  | 8281  | 8291  | 8301  |
| 44              | 8311  | 8321         | 8331  | 8341  | 8351  | 8361  | 8371  |
| 45              | 8381  | 8391         | 8401  | 8411  | 8421  | 8431  | 8441  |
| 46              | 8451  | 8461         | 8471  | 8481  | 8491  | 8501  | 8511  |
| 47              | 8521  | 8531         | 8541  | 8551  | 8561  | 8571  | 8581  |
| 48              | 8591  | 8601         | 8611  | 8621  | 8631  | 8641  | 8651  |
| 49              | 8661  | 8671         | 8681  | 8691  | 8701  | 8711  | 8721  |
| 50              | 8731  | 8741         | 8751  | 8761  | 8771  | 8781  | 8791  |
| 51              | 8801  | 8811         | 8821  | 8831  | 8841  | 8851  | 8861  |
| 52              | 8871  | 8881         | 8891  | 8901  | 8911  | 8921  | 8931  |
| 53              | 8941  | 8951         | 8961  | 8971  | 8981  | 8991  | 9001  |
| 54              | 9011  | 9021         | 9031  | 9041  | 9051  | 9061  | 9071  |
| 55              | 9081  | 9091         | 9101  | 9111  | 9121  | 9131  | 9141  |
| 56              | 9151  | 9161         | 9171  | 9181  | 9191  | 9201  | 9211  |
| 57              | 9221  | 9231         | 9241  | 9251  | 9261  | 9271  | 9281  |
| 58              | 9291  | 9301         | 9311  | 9321  | 9331  | 9341  | 9351  |
| 59              | 9361  | 9371         | 9381  | 9391  | 9401  | 9411  | 9421  |
| 60              | 9431  | 9441         | 9451  | 9461  | 9471  | 9481  | 9491  |
| 61              | 9501  | 9511         | 9521  | 9531  | 9541  | 9551  | 9561  |
| 62              | 9571  | 9581         | 9591  | 9601  | 9611  | 9621  | 9631  |
| 63              | 9641  | 9651         | 9661  | 9671  | 9681  | 9691  | 9701  |
| 64              | 9711  | 9721         | 9731  | 9741  | 9751  | 9761  | 9771  |
| 65              | 9781  | 9791         | 9801  | 9811  | 9821  | 9831  | 9841  |
| 66              | 9851  | 9861         | 9871  | 9881  | 9891  | 9901  | 9911  |
| 67              | 9921  | 9931         | 9941  | 9951  | 9961  | 9971  | 9981  |
| 68              | 9991  | 10001        | 10011 | 10021 | 10031 | 10041 | 10051 |
| 69              | 10061 | 10071        | 10081 | 10091 | 10101 | 10111 | 10121 |
| 70              | 10131 | 10141        | 10151 | 10161 | 10171 | 10181 | 10191 |
| 71              | 10201 | 10211        | 10221 | 10231 | 10241 | 10251 | 10261 |
| 72              | 10271 | 10281        | 10291 | 10301 | 10311 | 10321 | 10331 |
| 73              | 10341 | 10351        | 10361 | 10371 | 10381 | 10391 | 10401 |
| 74              | 10411 | 10421        | 10431 | 10441 | 10451 | 10461 | 10471 |
| 75              | 10481 | 10491        | 10501 | 10511 | 10521 | 10531 | 10541 |
| 76              | 10551 | 10561        | 10571 | 10581 | 10591 | 10601 | 10611 |
| 77              | 10621 | 10631        | 10641 | 10651 | 10661 | 10671 | 10681 |
| 78              | 10691 | 10701        | 10711 | 10721 | 10731 | 10741 | 10751 |
| 79              | 10761 | 10771        | 10781 | 10791 | 10801 | 10811 | 10821 |
| 80              | 10831 | 10841        | 10851 | 10861 | 10871 | 10881 | 10891 |
| 81              | 10901 | 10911        | 10921 | 10931 | 10941 | 10951 | 10961 |
| 82              | 10971 | 10981        | 10991 | 11001 | 11011 | 11021 | 11031 |
| 83              | 11041 | 11051        | 11061 | 11071 | 11081 | 11091 | 11101 |
| 84              | 11111 | 11121        | 11131 | 11141 | 11151 | 11161 | 11171 |
| 85              | 11181 | 11191        | 11201 | 11211 | 11221 | 11231 | 11241 |
| 86              | 11251 | 11261        | 11271 | 11281 | 11291 | 11301 | 11311 |
| 87              | 11321 | 11331        | 11341 | 11351 | 11361 | 11371 | 11381 |
| 88              | 11391 | 11401        | 11411 | 11421 | 11431 | 11441 | 11451 |
| 89              | 11461 | 11471        | 11481 | 11491 | 11501 | 11511 | 11521 |
| 90              | 11531 | 11541        | 11551 | 11561 | 11571 | 11581 | 11591 |
| 91              | 11601 | 11611        | 11621 | 11631 | 11641 | 11651 | 11661 |
| 92              | 11671 | 11681        | 11691 | 11701 | 11711 | 11721 | 11731 |
| 93              | 11741 | 11751        | 11761 | 11771 | 11781 | 11791 | 11801 |
| 94              | 11811 | 11821        | 11831 | 11841 | 11851 | 11861 | 11871 |
| 95              | 11881 | 11891        | 11901 | 11911 | 11921 | 11931 | 11941 |
| 96              | 11951 | 11961        | 11971 | 11981 | 11991 | 12001 | 12011 |
| 97              | 12021 | 12031        | 12041 | 12051 | 12061 | 12071 | 12081 |
| 98              | 12091 | 12101        | 12111 | 12121 | 12131 | 12141 | 12151 |
| 99              | 12161 | 12171        | 12181 | 12191 | 12201 | 12211 | 12221 |
| 100             | 12231 | 12241        | 12251 | 12261 | 12271 | 12281 | 12291 |
| 101             | 12301 | 12311        | 12321 | 12331 | 12341 | 12351 | 12361 |
| 102             | 12371 | 12381        | 12391 | 12401 | 12411 | 12421 | 12431 |
| 103             | 12441 | 12451        | 12461 | 12471 | 12481 | 12491 | 12501 |
| 104             | 12511 | 12521        | 12531 | 12541 | 12551 | 12561 | 12571 |
| 105             | 12581 | 12591        | 12601 | 12611 | 12621 | 12631 | 12641 |
| 106             | 12651 | 12661        | 12671 | 12681 | 12691 | 12701 | 12711 |
| 107             | 12721 | 12731        | 12741 | 12751 | 12761 | 12771 | 12781 |
| 108             | 12791 | 12801        | 12811 | 12821 | 12831 | 12841 | 12851 |
| 109             | 12861 | 12871        | 12881 | 12891 | 12901 | 12911 | 12921 |
| 110             | 12931 | 12941        | 12951 | 12961 | 12971 | 12981 | 12991 |
| 111             | 13001 | 13011        | 13021 | 13031 | 13041 | 13051 | 13061 |
| 112             | 13071 | 13081        | 13091 | 13101 | 13111 | 13121 | 13131 |
| 113             | 13141 | 13151        | 13161 | 13171 | 13181 | 13191 | 13201 |
| 114             | 13211 | 13221        | 13231 | 13241 | 13251 | 13261 | 13271 |
| 115             | 13281 | 13291        | 13301 | 13311 | 13321 | 13331 | 13341 |
| 116             | 13351 | 13361        | 13371 | 13381 | 13391 | 13401 | 13411 |
| 117             | 13421 | 13431        | 13441 | 13451 | 13461 | 13471 | 13481 |
| 118             | 13491 | 13501        | 13511 | 13521 | 13531 | 13541 | 13551 |
| 119             | 13561 | 13571        | 13581 | 13591 | 13601 | 13611 | 13621 |
| 120             | 13631 | 13641        | 13651 | 13661 | 13671 | 13681 | 13691 |
| 121             | 13701 | 13711        | 13721 | 13731 | 13741 | 13751 | 13761 |
| 122             | 13771 | 13781        | 13791 | 13801 | 13811 | 13821 | 13831 |
| 123             | 13841 | 13851        | 13861 | 13871 | 13881 | 13891 | 13901 |
| 124             | 13911 | 13921        | 13931 | 13941 | 13951 | 13961 | 13971 |
| 125             | 13981 | 13991        | 14001 | 14011 | 14021 | 14031 | 14041 |
| 126             | 14051 | 14061        | 14071 | 14081 | 14091 | 14101 | 14111 |
| 127             | 14121 | 14131        | 14141 | 14151 | 14161 | 14171 | 14181 |
| 128             | 14191 | 14201        | 14211 | 14221 | 14231 | 14241 | 14251 |
| 129             | 14261 | 14271        | 14281 | 14291 | 14301 | 14311 | 14321 |
| 130             | 14331 | 14341        | 14351 | 14361 | 14371 | 14381 | 14391 |
| 131             | 14401 | 14411        | 14421 | 14431 | 14441 | 14451 | 14461 |
| 132             | 14471 | 14481        | 14491 | 14501 | 14511 | 14521 | 14531 |
| 133             | 14541 | 14551        | 14561 | 14571 | 14581 | 14591 | 14601 |
| 134             | 14611 | 14621        | 14631 | 14641 | 14651 | 14661 | 14671 |
| 135             | 14681 | 14691        | 14701 | 14711 | 14721 | 14731 | 14741 |
| 136             | 14751 | 14761        | 14771 | 14781 | 14791 | 14801 | 14811 |
| 137             | 14821 | 14831        | 14841 | 14851 | 14861 | 14871 | 14881 |
| 138             | 14891 |              |       |       |       |       |       |



336









SUBJECT: CUNNIE  
 BEGIN 3 3 32.3  
 1480 15100

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Printing...

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43 ..... 14900 14990 15000 15010 15020 15030 15040 15050 15060 15070 15080 15090 15100 15110 15120

928 916 003

Turn right (Road)

Begin for full forward

WHERE

LIVE

where does Lopez live?

Exactly

"WELL"

"UMM"

ME...



...TALL\* BUILDING-  
y tall building...

It was really (that tall) when you saw it?

6P19-333

... (etc.)

595  
855

628

PUT-ON-top of building

628

| Line | 30811 | 30821 | 30831 | 30841 | 30851 | 30861 | 30871 | 30881 | 30891 | 30901 | 30911 | 30921 | 30931 | 30941 | 30951 |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1    | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 2    | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 3    | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 4    | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 5    | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 10   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 12   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 13   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 15   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 17   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
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| 26   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 32   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 45   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

905 939

Begin Robin

ME

905 (with light) 935

Begin head down (with)

FAR

DEAF

CAN

LIPREAD

early

Can deaf people really lipread that easily [from that far away] ? well, [you and I both know they can't]. I rem

ME

Translation

[illegible]

<<XXXXXXXXXXXX>>

<<000000000000>>

<<<<<<vYyYyY>>>>>

«X»

.....

[illegible]

**00000000000000000000000000000000**

122. | (neck tightened) 835  
head down → (hold)

506 6E6

Can deaf people really lipread that easily [from that far away]? Well, [you and I both know they can't]. I remember that. ...

DEAF — CAN — LIPREAD-easily — ME — REMEMBER ...

(Begin Return)

(read down) — (hold)

(then, up again)



[illegible]

XXXXXXXXXXXXXXXXXXXX

[illegible]

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|           |                   | begin hand straight back            |               |        |       |
|           |                   | begin slow shake (straight) pt down |               |        |       |

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Hands

Translation

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| 25-34     | 100       | 100      | 100        | 100      | 100        |
| 35-44     | 100       | 100      | 100        | 100      | 100        |
| 45-54     | 100       | 100      | 100        | 100      | 100        |
| 55-64     | 100       | 100      | 100        | 100      | 100        |
| 65-74     | 100       | 100      | 100        | 100      | 100        |
| 75+       | 100       | 100      | 100        | 100      | 100        |

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## Appendix B: CONTENTS

## A. Male Dyad:

(L) 0.16.2-0.17.6

Discussing the printing business and how a person can get I-T-U (International Typesetters Union) card and pass it around on the sly. But it's hard to get the card. (Carol interrupts dyad, then Brian continues.) Brian's KNOW-THAT refers to how you can trick folks with the card..."many can"...

(L) 0.28.4-0.30.3

(con't. from previous segment) Larry went to the Washington Post and gave the card to the shop steward who looked at it and said "OK, go ahead and work". L- "So I did computer typesetting. (I'm a really good typist.) And I was doing fine"...

(L) 1.26.9-1.30.5

(still on experiences in printing business, then lull in conversation, then Larry begins...)

(L) 2.12.2-2.14.8

Discussing how union members take advantage of the travel card to rip off the printing companies. For example, you can take a job at one place, work there until you get permanent status, then quit and get the money for four weeks paid vacation. Brian- "I lost out. I started in this thing at the wrong time." L- "It was better a long time ago?" B- "Oh yeah! Folks used to hop from job to job - like at the Star, just work there for a week, become (the equivalent of permanent status - S-I-T?), get the paid vacation, and really take advantage of the set-up, drawing in a thousand dollars"...

(L) 2.25.5-2.27-8

Brian's been describing how you can make a lot of money by doing that join-quit routine, working your way all around. "But now I think that's stopped." L- "I heard the Washington Post proposed that if you wanna quit, they will buy you out and".... (During first part of L's utterance, B says "Yeah, they'd pay you off in one lump sum"...) "Buy out" is a way of paying employees to leave the business; the union membership gives employees the right to stay on, but they can opt for the money and leave. The change in type from hot to cold meant less need for workers, so businesses devised this way to get rid of employees.

(B) 2.33.0-2.37.7

Brian is saying "Yeah, it's closed. Now anyone who quits gets nothing, unless they were forcefully removed/kicked out. Then the union will give them some financial compensation."... During B's next utterances, Larry begins "I doubt it" (that union will pay compensation?). At end of B's turn, he chimes in, "Yeah, like Jack, for example. It's awful. He doesn't have any money"...

(B) 5.50.9-5.53.3

Brian says that at the GPO (Government Printing Office), you need to keep track of your time via a time card. And if you get behind, they'll warn you. And they measure your job performance in reference to your time card. But the commercial newspaper companies really don't care about that time card stuff. "I think they now have 400 men but really need only 50."...

(L) 5.58.9-6.02.6

Larry says "Where my father works, whew!, they used to have 200 men. But now they've cut down to 20. Why? Cuz the men didn't have much to do."...

(L) 7.30.0-7.36.5

They've been discussing football team problems with personnel and finance. Brian says that the players have proposed ending the reserve clause and increasing the minimum wage, etc. Larry says that's crazy, that they'd go in the hole if they did that. Brian responds that the players think the owners can afford these changes. Larry responds "They can't!"...

(L) 8.02.2-8.03.7

Joe Namath plays for the New York Jets. Washington's most recent game was with the Jets. L & B are talking about how quarterbacks make a lot of money - for example, Joe Namath. Brian says "Yeah, all he has to do is drop back and pass" as Larry says "He gets a million easy"... After L's question, Brian responds "The Washington game, yeah, I saw it"...

(L) 8.59.6-9.00.7

They're talking about various football players, and Brian says "I like Randy Johnson. He seems good." Larry then responds...

(L) & (B) 9.08.2-9.21.2

They're talking about the football player, Randy Johnson, saying that he used to play with the New York Giants, then the Atlanta Falcons. But he used to get sacked a lot. Then Brian begins "But now with Washington..."... At end of dialogue, Larry asks "Oh, you saw them?" and Brian responds "Yeah, I saw..." as Larry says "Oh...".

(B) 11.17.0-11.20.3

They're talking about football injuries; Larry tells about his, then Brian, his. A Gallaudet player named Mike Wallace who played last week badly injured his knee, tearing his ligament. Brian describes it...

(L) 12.42.5-12.44.0

Talking about football, then there's a lull in the conversation after which Larry asks the question.... And Brian responds, "I think it's a church team"...

(L) 13.22.3-13.25.5

They're talking about Gallaudet's football record. Larry says that Gallaudet's been losing again and again. Brian responds "Well, I expected that would happen..." as Larry interrupts to ask about Suiter... Brian says he has a tendon injury in his right hand. Larry responds "That's awful!"

(L) 14.50.1-14.54.0

Brian says "Hey! This is really off the subject but let me ask you - Charlie Garabrant, do you know where he is now?" Larry responds... and Brian then responds to Larry "Noooo, Charlie? I read in the newspaper that he's here now."

(B) II 0.43.4-0.47.2

They're talking about a new football team that's been set up. There will be a meeting about it tonight. Brian is also mentioning different teams that will be in this league - East Baltimore, Block G, "third is my team"...

(B) II 1.01.2-1.05.1

Discussing teams in this new league. Brian sets up "Kurtz" on his left (twice) and says "You know Kurtz, he's"...

(B) & (L) II 2.25.6-2.35.7

Discussing new teams. In the past they have been playing at Riverdale. They also wanted to get to use the Gallaudet intramural facilities for two years, but there have been problems due to time conflicts (because Gallaudet has changed its time schedule). Brian says his team now can use the Gallaudet facilities (only) all day Saturday and part of Sunday. But Gallaudet's intramural games are on Sunday morning and that's a problem because Brian's team wants to play on Sunday morning so they can watch the other football games on TV on Sunday afternoon. Brian says "So they say..." At the end of the segment, the contract that is for three years was signed two years ago so they have one year left. Brian says "Ray signed it and this is the last year." Larry responds "That's terrific. Three years." Brian adds "We'll hold the contract so if things don't work out with Gallaudet, we'll still have a field to play on."

(B) II 4.57.2-5.00.7

Discussing last year's football season, how it was so poorly managed. And a major problem was that players who knew they wouldn't be eligible for the playoffs later stopped coming to the games during the season. The same thing happened to Larry; he lost motivation and started cutting games, especially because of this one guy on the team who really didn't take the game seriously. He would just pass the ball in any old direction and played really poorly. The guy got on Larry's nerves. And Larry says the guy "just didn't care" as Brian asks his question... Larry answers "Yeah, I used to play quarterback, but I preferred playing end"...

(L) II 5.02.0-5.06.9

(continues from segment above)...

At end of Larry's turn, Brian corroborates Larry's comments, "Yeah, they really make you look bad."

(B) II 6.06.6-6.08.2

Talking about how, in their student days, everyone was buying huge cars. But now they're buying vans. Brian says "like Suiter, and so many I can't count 'em"... Larry responds to Brian's comment "Yeah, those deaf folks are rich!" and both erupt into sarcastic laughter.

(B) II 8.23.4-8.26.8

Brian is telling about this Gallaudet student who was speeding when the D.C. police started chasing him. He raced into Gallaudet and ran into several cars, doing a lot of damage. The cops caught him and started to take him off campus (Larry says "They should have put him in jail!") for all that, plus he could have been charged with"... (trying to think of the word "murder")

(B) II 11.46.9-11.49.3

Larry's talking about his 1972 motorcycle that's in good shape and has 34,000 miles on it. He decided to sell it, posted an ad on the bike, but then kept changing his mind about selling it. Brian asks... Larry responds "Yeah, same (make) as mine, but mine's a little different." Brian says "He (Miller) says he wants to keep his 'cuz it might become an antique."

(L) II 15.30.4-15.31.8

Brian describes a close call on his motorcycle during a trip to Richmond, how his cycling friends stopped at 7-11's on the way for beer and how they were all drunk by the time they got there. Then Larry begins to describe his undergraduate years at Gallaudet when he used to go with a group to Ocean City. His motorcycle was new when he bought it. And each person in the group in turn bought one too. So in the group, they had a total of seven motorcycles that would be all lined up side by side. Larry says the 7 cycles were "all the same make"... "One was blue, two were green, several were red - a real mixture of colors."

(B) II 16.20.9-16.24.1

Larry's describing a tour of the U.S. he took on his motorcycle. He went 11,700 miles with no oil check, no maintenance, etc. Then he started to have some problems with it. So when he returned from the tour, he overhauled and tested it and then sold it to a deaf guy. Brian asks "Before that you had a Harley Davidson?" Larry responds "Before that I had a Triumph but had problems with it and traded it in for a Harley; and I haven't changed from Harleys ever since..." Brian then asks his question...

(B) II 17.23.5-17.27.2

Larry's talking about this guy who borrowed his car and had an accident with it while up north. The guy ran into something, flipped the car over, and the front and roof and everything was bashed in. The thing was all wrecked but he brought it back here. "I told him he was crazy. He drove it all the way from (Brian-"Awful!") South Dakota"... After Brian's question, Larry responds "Oh yeah. The police nabbed him and warned him..."

(L) II 19.06.0-19.09.7

Larry's describing his work on his car, trying to take out the transmission with the help of his friends, Levesque and Gordon. "I told 'em we were gonna need muscles"...

## B. Female Dyad:

(W) 0.44.1-0.46.8

Wanda is talking about the smog in California. A male friend of hers who works at the Riverside School for the Deaf (in southern California) says he wants to move up north to get away from the smog but that ironically, the north has smog too. "So I looked at him and thought"... At the end, getting no support from Cinnie, Wanda says "Well, I think Berkeley's much better." (The school for the deaf up north was in Berkeley at that time.)

(W) 1.01.3-1.11.9

Talking about schools for the deaf. Cinnie says that when she compares Fremont (city that the Berkeley school was scheduled to move to) with Berkeley, "Berkeley's much better. But Berkeley still has fire hazards, earthquakes, etc. Ugh! I'd move to Fremont." Wanda then asks "Ohhh...".... After the sequence of turn exchanges, Cinnie replies "I went down to San Diego..."

(W) 1.20.3-1.21.6

Cinnie says that she went to San Diego for the "Across the Lines" tournaments and asks if Wanda has heard of them. Wanda says "Yes, I was there! I remember." and Cinnie responds "Oh, that's right, you were there, yes." Then Wanda asks "Oh, so you went for a short time to see the tournament - Who'd you go with?" Cinnie responds "Ummm, I forget, oh, Jake Ruth..."

(C) 3.20.2-3.22.3

Talking about the climate in California. Cinnie doesn't like the summer heat in the Central Valley where it's around 100°-150°F. Wanda says "Yeah, I felt the same way when I was staying at my friend, Lopez's house in that area. Cinnie asks her question.... then W responds "I forget exactly..."

(C) 5.07.8-5.11.4

Talking about a movie, "Towering Inferno", that was being shot in San Francisco when Wanda was there. (Both later saw the movie.) Wanda was at the movie site, waiting with the crowd to see Paul Newman and watching the make-up crew. Wanda says they were waiting and waiting.... and then Cinnie interrupts with her question.... (Cinnie knows the SF area well and knows that the tall building in the movie doesn't really exist in SF so they had to have added something to another building or something.) At end, Wanda replies "It was really a hotel, no, a bank - not that tall, but made to look that way with the camera."

(W) 7.49.3-7.51.6

Talking a film in which a hearing person played a deaf person, then about another Japanese film, then a TV program called "Mannix" where a man said on the phone "I killed (someone)" and a deaf person saw him say that and reported it to the police who caught they guy. Wanda says "Oh yeah, from lipreading. I remember that episode. But many folks who watched it said it was exaggerated a bit because the distance was so great (for lipreading)"... Later she adds, "I remember that. When I saw it, I thought "Hah! Really exaggerated!..."

(W) 9.03.1-9.06.5

Talking about a TV program, "Family Affair", that has two kids on it. The TV crew went to the Berkeley school to get a deaf girl. In the show, the mother thought the girl couldn't learn anything, that she was hopeless and didn't know her name. But in actuality, she was intelligent. The two kids met her and tried to help her. The kid, Buffy, acted like a speech therapist. Anyway the mother was surprised at her daughter's accomplishments after Buffy's training and said "Oh my! My child can learn!" Cinnie has been describing all this and then Wanda jumps in to ask "How'd"... At the end, Cinnie says, "Yes, the girl was able then to say her name."

(C) 9.34.5-9.35.5

Wanda's describing a TV show which depicted a guy who was supposed to be a "low verbal" deaf guy. a dumb guy. She asks Cinnie if she saw it. After a short pause, Cinnie asks... and Wanda responds "It was last spring..."

(W) 14.41.8-14.41.3

Cinnie is asking about Wanda's graduate program at Gallaudet. Wanda explains that it was a last minute decision for her to enter grad school. She had thought it would require too much work and energy. And she had decided to drop it because her major was "different" from those she thought were acceptable. (At that time, the only grad program at Gallaudet was in Education.) She explains... "I didn't think so because I had heard that they preferred English majors, history majors..."

(C) 16.04.2-16.05.7

Wanda is describing her grad classes, including a course in Sim-Com (Simultaneous Communication) which meant voice with sign. But she wonders why did she have to take that. "In my class, in our group, many of us were deaf..." Cinnie interrupts to ask "You say that..." to which Wanda replies "Ten of us were deaf."