

If historical sign language materials were assembled, how might they  
be presented and made accessible to users?

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Because American Sign Language (ASL) is a language without a writing system, the study of historical change in ASL has been almost impossible; no data are available from written materials on early forms of the language, except a few sketchy descriptions of how some early individual signs looked. However, in the early part of this century, the National Association of the Deaf (NAD) created a set of films of the most fluent 'sign masters' of the time. Their goal was to preserve and demonstrate the sign language of the epoch. Twenty-two films were made between 1910 and 1920, fourteen of which have survived. They featured speeches, poetry and stories performed by 12 master signers. The master signers were of different ages, providing a sample of three generations of ASL users at the time. The original copies of the NAD films are stored in the archives of Gallaudet University and the Library of Congress. In 1997, Sign Media, Inc. produced a videotape copy of the NAD films. These films have turned out to be a rich source of material for analyses of historical change in ASL (Frishberg (1975), Woodward & Erting (1975), Woodward (1976, 1978), Supalla, 1998 and in progress). It is believed that ASL was formed in the natural interactions of Deaf children and adults (plus some contribution of Langue des Signes Francaise from Deaf educator Laurent Clerc), beginning with the establishment of the first American school for the deaf in 1817. The period from 1910 to 1920 is therefore approximately halfway through the history of language, and comparisons with current ASL provide significant and revealing insights into the formation of the structure of a natural sign language.

Three years ago we began to develop a transcription and linguistic coding of these historical NAD films, with an interest in examining whether between that time and the present one could see evidence of significant historical change in the structure of signs and sentences in the language. To date, we have performed three different types of database work with the NAD films: 1) transcription and translation of the signed performances; 2) the creation of inventories of lexical items and grammatical categories; and 3) the development of a prototype for a computer-assisted storage and retrieval system.

A transcription/translation file was created for each film using Excel. For each sentence, the time code at the beginning of each sentence was noted, and the sentence was transcribed using 'glosses.' Glosses encode each ASL sign using an English word having roughly the same meaning as the sign. We have used previously established glossing conventions (Baker & Cokely, 1980; Mikos, Lentz & Smith, 1992) with a few additional glosses we developed ourselves. The gloss transcription was expanded using descriptions of the form and morphology of grammatically complex signs, such as noting the beginning and ending locations of a sign inflected for subject and object agreement. A transcription key was created that lists all the abbreviations used in this morphophonological description. At present, the transcription does not include a description of the nonmanual components of the sentence (i.e. facial expressions and body postures which are used as part of grammar of ASL), which we plan to include in future work. For each sentence, a NOTES field was created to contain information such as transcription questions, idiosyncrasies about a particular sign, or variations between the early and current form of a sign.

The transcription/translation file also includes a full English translation for each ASL sentence. In many cases, the master signer performed an ASL version of a poem or story adapted from English literature. In these cases, we used the original English text as the translation. Some films had previously been translated, in which case we used the existing translation, filling in gaps and correcting any errors. At present, all 14 of the NAD films have been fully transcribed and translated (see Table 1 below).

**Table 1**  
**NAD Films: Sentence and Sign Counts**

<u>Signer</u>	<u>Title</u>	<u>Sentences</u>	<u>Signs</u>
Cloud/McCarthy	A Plea for a Statue of de l'Epee in America	19	284
G. T. Dougherty	The Discovery of Chloroform	38	360
A. G. Draper	The Signing of the Charter of Gallaudet College	26	239
Mary Erd	The Death of Minnehaha	41	402
E. A. Fay	Dom Pedro's Visit	21	259
T. H. Fox	Gettysburg Address	27	362
E. M. Gallaudet	Lorna Doone	106	879
J. B. Hotchkiss	Memories of Old Hartford	87	747
W. Hubbard	Address at the Tomb of Garfield	38	356
W. E. Marshall	Yankee Doodle	32	219
McGregor	Lay Sermon	74	674
McGregor2	The Irishman's Flea	17	88
McGregor3	The Lady & the Cake	14	90
G. W. Veditz	The Preservation of Sign Language	60	574

The transcription and translation have thus been completed on a database of 5533 signs and 600 sentences of early ASL. But the transcription and translations our research group has developed for our own purposes, if available in an appropriate format and accompanied by other materials standardized in a similar way, could be just as valuable to a much larger audience of users.

To this end we are currently developing a prototype of a computer-assisted storage and retrieval system for the NAD data. The video copies of films are digitized, then compressed and stored in a QuickTime file. The transcriptions, translations and notes on the signed performances have been transferred from the Excel files to a HyperCard stack, so that each card contains the

information on a single sentence. Then each card is linked to that portion of the digitized film containing the signed sentence transcribed on the card. The result is a sequence of cards, each with fields displaying the digitized version of the NAD signer performing the sentence, its transcription, translation and notes. To date we have entered all 14 NAD films with their transcriptions into this HyperCard multimedia system.

Our ultimate goal is to build a comprehensive platform to store and access the NAD films, equipped with a variety of different search engines, and links to other relevant data. At present we are working on creating links from the historical ASL data to other tokens of the same sign within the early ASL materials and to a digitized video of the same sign in modern ASL; links to entries in historical dictionaries we have located and have begun reconstructing; and links to the equivalent sign in historically related foreign sign languages (for example, *Langue des Signes Francaise*). As the first step in this process, we have created a new Excel inventory file which organizes the information, sign by sign, across the filmed materials. The gloss for each sign from the transcription is listed in a column. In a separate column is listed the video clip index in which the sign is used, and its grammatical category. A separate inventory is made for each signer, listing the signs in their order of appearance. In addition, a comprehensive inventory of all signs produced across all the films has been created and alphabetized. A Lexical Item Frequency Inventory records the number of times each lexical item occurs, and inventories for each grammatical category lists the number of times signs from different grammatical categories were produced. The inventories have been expanded to include columns in which features of morphology usage (inflections for aspect, person, number, etc.) are indicated for each sign. This morphophonological information is particularly important for future grammatical and historical analyses.

Given these many types of linguistic information which need to be linked, it is obvious that we should choose an approach in which the linguistic content is identified in a multiple-level catalog of records, with levels in the catalog representing linguistic layers of information (i.e., phonetic, morphemic, lexical, phrasal and semantic). Links and search routines under such a platform will enable users to access the NAD data either by sentence or by individual signs, and will link these to

gloss and phonetic transcriptions, translations, and dictionary entries. To provide access to supplementary historical information, each sign gloss will also be co-referenced to indicate if that sign was found in either of three sign language dictionaries of the time: Long (1910), Higgins (1923) and Michaels (1923). The co-referencing for each sign will include the name of the dictionary, the page number of the entry, and whether the dictionary shows a variant form of the sign. Later modern forms and related forms from other sign languages could be added to the database and linked to the historical ASL signs. In addition, supplementary materials will be linked to the database, including biographies of the master signers and historical background of the film collection.

At present, we have not created a phonetic transcription of the NAD film performances. Such a transcription would describe at a detailed level the form of each sign, as it is produced, including its handshape, location, orientation and movement. There are a variety of phonetic transcription systems available for sign languages, and we plan to select one or more to create a phonetic transcription. When completed, the user will be able to click on the gloss for a sign to access its phonetic transcription, other examples of the same sign in the NAD database, its modern ASL equivalent, and references to locations in dictionaries where the sign is listed. Such links will permit users to determine the phonological variants of individual signs, as well as any phonological changes of this sign through time. We will also create another search engine that will search for signs by handshape, movement and location features, so that a user could, for example, search for all signs used in the NAD films which contained a specific handshape. Other search routines will allow users to search for individual lexical items, glosses, morphological and phonetic features of signs and non-manual markers.

This multimedia integration of historical corpora, hypertext cross referencing, and linguistic knowledge base on a personal computer platform will require the addition of at least three tools: 1) an interface technology for synchronization of video and text (i.e., SignStream or Video Tagger); 2) an effective transcription tool that will allow us to convert sign glosses and phonetic notation into digital forms; and 3) a relational database to allow cross-indexing of linguistic elements (i.e., SignPhon). This system would constitute a unique database of historical ASL data, and also a powerful

comparative tool which could be used by sign language researchers studying different contemporary sign languages.

We also need to design an indexing system that would be consistent with current technology for collecting and organizing language data. We need to review various technical approaches for cataloguing and indexing, to determine what we can adapt for presenting our multi-level and multi-type linguistic information. By this route we hope to maximize interoperability to other current computerized language corpora, thus enhancing the potential of this project to contribute to better understanding of language universals and variation and their formation through time.

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