

What Quantitative Sociolinguistics Has Taught Us about the Structure of Sign Languages

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The Theme of this TISLR: Research Methodologies in Sign Language Linguistics

We constantly observe variation at all levels of language:

- * phonological: e.g. handshape, location, orientation, handedness
- * morpho-syntactic: e.g. pro-drop, repetition of lexical items and phrases
- * lexical: numerous examples
- * discourse: conversation openings and closings, back-channeling

As Bayley (2002: 117) states:

“Understanding of language requires an understanding of variable as well as categorical processes and that the variation that we witness at all levels of language is not random. Rather, linguistic variation is characterized by orderly or “structured heterogeneity” (Weinreich et al. 1968). That is, speakers’ choices between variable linguistic forms are systematically constrained by multiple linguistic and social factors that reflect underlying grammatical systems and that both reflect and partially constitute the social organization of the communities to which users of the language belong.”

I have resisted the term *sociolinguistics* for many years, since it implies that there can be a successful linguistic theory or practice which is not social.

William Labov, 1972

The basic tenet of quantitative sociolinguistics:

if our ultimate goal is to produce a model of language structure, that model must account for variation in a principled and non-dismissive way.

It is only through an analysis of variation that the reality and meaning of a norm can be established at all.

Edward Sapir, 1938

Weinreich et al. (1968) challenged Chomsky’s *homogeneous speech community* (1965) and “ the corresponding theoretical irrelevance of diversity. They instead offer a different view of change, where variation and regularity are both an integral part of language change.”
(Hazen 2007: 74)

Quantitative sociolinguistics provides us a way to study this structured heterogeneity.

Some principles:

1. *The principle of quantitative modeling*: the forms that a variable takes can be closely examined and the features of the context that co-occur with a variable form can be noted. Context includes the surrounding linguistic environment and the social factors that co-occur with the variable.

2. *The principle of multiple causes*: it is unlikely that any single contextual factor can explain the variability observed in natural language data.

“With a large enough set of data, we are able to make statements about the likelihood of co-occurrence of a variable form and any of the contextual features in which we are interested...[with] the focus on actual language as produced by speakers in communities rather than on linguistic intuitions, or grammaticality judgments, as has been the practice in formal linguistics” (Bayley 2002: 118, 122).

A Third Principle

3. *The principle of accountability*: “any variable form (a member of a set of alternative ways of ‘saying the same thing’) should be reported with the cases in which the form did occur in the relevant environment, compared to the total number of cases in which it might have occurred.”

(Labov 1969, Sankoff 1990)

That is, researchers must account for all of the data and not pick and choose examples to fit theories.

The Origins of Quantitative Sociolinguistics

* Quantitative sociolinguistic studies began in the early 1960s, with the work of William Labov in New York and Philadelphia (Labov 1966, 1969, 1972a, 1972b).

* A key early study: the raising and centralization of vowels on Martha’s Vineyard (published in *Word*, 1963, also 1972).

* He found that centralization corresponded with certain age groups and with orientation towards Martha’s Vineyard:

* centralization is a recent development and younger speakers centralize more than do older ones

* the greater the allegiance to the island, the more centralization produced by a speaker

- He demonstrated that sound change was observable in synchronic variation, not necessarily slow across long periods of time.
- He demonstrated that sound changes were connected to social forces in a community.

What Quantitative Sociolinguistics Looks Like in Sign Languages

➤ James Woodward led the first studies of phonological variation in ASL in the 1970s: lowering/centralization, handedness, thumb extension; also lexical variation

➤ 1994- 2001: Lucas, Bayley and Valli, sociolinguistic variation in ASL

➤ 2007- : McCaskill, Lucas, Bayley and Hill, Black ASL

➤ 2003- : Schembri, Johnston et al., Auslan

➤ 2008- 2010 : Schembri et al., BSL

➤ 2005- : McKee, McKee et al., NZSL

➤ 2008- : Geraci, Cardinaletti, Cecchetto, Donati et al., LIS

What we mean by “quantitative”, 1:

☐ Lucas, Bayley and Valli 2001 : 7 US sites, 207 signers

☐ Schembri, McKee, McKee, Pivac, Johnston and Goswell 2009:

5 sites and 205 signers in Australia; 3 regions and 138 signers in New Zealand

☐ McCaskill, Lucas, Bayley and Hill 2011: 6 US sites and 96 signers

☐ Geraci, Cardinaletti, Cecchetto and Donati 2010: 10 sites and 180 signers in Italy

What we mean by “quantitative”, 2

Language	Variable	# of Tokens (examples)
ASL	1 handshape	5195
	location	2862
	DEAF	1618
	Pro- drop	429
Black ASL	2 hand → 1 hand	818 (+ 2258, earlier study)
	location	877 (+ 2862, earlier study)
	Size of signing space	2247
	Clausal or phrasal repetition	172
	Mouthing	221
	Constructed dialogue/ constructed action	1021
Auslan / NZSL	Location	2667, Auslan, 2096 NZSL
LIS	WH elements	884 annotated, 413 coded

Quantitative Sociolinguistics Has Taught Us About :

1. The Nature of the System
2. How the System Changes
3. How Varieties Come About

...and that ain't bad.

Jack Nicholson, *Mars Attacks*

1. The Nature of the System

- Quantitative sociolinguistics has revealed the role of grammatical function in sign language variation.
- As reported at TISLR 9 in 2006, studies prior to 2001 claimed phonological factors as the only factors in explaining phonological variation in sign languages (e.g. Battison, Markowicz and Woodward 1975, Woodward and DeSantis 1977, Liddell and Johnson 1989).
- However, analyses of ASL, Auslan and NZSL have revealed the role of grammatical function in understanding sign language variation:

Linguistic constraints on phonological variation in ASL: DEAF and the location of signs like KNOW

Variable	Analysis	Constraint ranking
DEAF	+cf vs. -cf	Grammatical function > discourse genre
	chin to ear vs. contact cheek	Grammatical function > location of following segment
Location of KNOW, etc.	+cf vs. -cf	Grammatical function > contact of following sign with body > location of preceding sign

Linguistic constraints on phonological variation in ASL: 1 handshape signs

Analysis	Constraint ranking
+cf vs. -cf	Grammatical function > features of preceding and following handshapes
L handshape vs. all others	Features of preceding and following handshapes > grammatical function
1 handshape vs. all others	Grammatical function > features of preceding and following handshapes

Location variation in Auslan and NZSL

Order of constraints:

- Sign type (grammatical function and lexical frequency)
- Preceding location
- Following location
- Following sign or pause
- Preceding contact

Interaction was noticed between grammatical function and frequency, leading to the new factor group, " sign type". Citation forms (at the forehead) were favored by 1) nouns, adjectives, and high frequency verbs; 2) preceding signs as opposed to preceding pauses; 3) following pauses. (Schembri et al. 2009)

So:

- ✓ Grammatical function plays a role in sign language variation that is sometimes more important than phonological factors;
- ✓ Morphology in spoken languages is, by and large, a "boundary phenomenon", i.e. it takes place at the boundaries of units - and this is where we find phonological variation in spoken languages as well;
- ✓ Morphology in sign languages is pretty much not a boundary phenomenon;
- ✓ We see from quantitative analysis that, as linguistic structure goes, so goes variation; quantitative analysis shows us that the modality differences that we already knew about are reflected in the variation.

2. How The System Changes

We know that variation is very often the first indication of change in progress.

Two examples:

1. Age differences in ASL and Auslan, with location : in both languages, younger signers markedly prefer non-citation [lowered] forms and older signers prefer citation forms. Centralization of signs has been documented starting with Frishberg (1976) and these differences may well indicate increased centralization from one generation to the next.

2. Repetition in Black ASL

172 examples drawn from 26 10-minute conversations, Black and White signers

What we coded for:

- Noun: #DAY STUDENT, #DAY STUDENT? [question directed at another signer]
- Adjective/Adverb: 2-DAY-AGO... 2-DAY-AGO, 2-DAY-AGO [response]
- Verb/predicate: SAME, LEAVE, LEAVE, LEAVE, LEAVE.
- WH sign: KILL, WHY, WHY?
- Function word (including pronouns): PRO.1, PRO.1, THAT...
- Verb Phrase/full sentence: PRO.2 BRAVE, PRO.2 BRAVE.
- Token response: RIGHT, RIGHT, RIGHT, RIGHT [response]

--McCaskill, Lucas, Bayley, & Hill, in press

Group	Noun	Adj/adv	Verb/pred	WH	Function sign (incl. Pro)	Verb phrase/full sentence	Token response	Total
Black male, old	10	4	20	0	2	14	1	51
Black female, old	3	1	9	2	2	13	7	37
Black male, young	7	1	0	0	0	7	1	16
Black female, young	4	1	1	0	0	12	8	26
White male, old	2	1	6	0	0	7	3	19*
White female, old	2	1	1	0	0	1	0	5
White male, young	2	1	1	0	0	4	0	8
White female, young	1	1	2	0	1	5	0	10
Total	31	11	40	2	5	63	20	172

Table 6.2. Repetition by grammatical function by race, gender, and age
Note: *18 from one signer.

Repetition Results

We see a marked difference

- 1) between Black signers and White signers
- 2) between older and younger Black signers- this seems to be a feature of Black ASL that is changing.

3. How the System Changes: How Varieties Come About

The History and Structure of Black ASL: project funded by the Spencer Foundation and the National Science Foundation, 2007- 2011.

Basic research question:

What are the features of the variety of ASL that people call “Black ASL”?

There are many anecdotal reports about its existence, “Yeah, I see something different...”; and, we have considerable evidence of lexical variation.

Can the same kind of unique features that have been identified for AAVE be identified for Black ASL, to show that it is a distinct variety of ASL?

That is the focus of our project ... BUT there is a question that needs to be asked BEFORE we try to answer the basic research question:

With study of the socio-historical situation and the quantitative analysis of conversational and interview data from 96 signers in 6 of the 17 states, we have been able to describe Black ASL as a variety of ASL, a variety that is changing.

Without stealing Joseph’s thunder for the panel this afternoon, here are the features that we analyzed as possibly making up this variety:

Hairston and Smith (1983): there is “a Black way of signing used by Black deaf people in their own cultural milieu- among families and friends, in social gatherings, and in deaf clubs” (55).

There also exists a 50-year tradition of research on African American Vernacular English (AAVE), with unique features identified at all levels of the language – phonology, morphology, syntax, lexicon – showing that AAVE is a distinct variety of English (see Mufwene et al. 1998 and Green 2004 for reviews).

What was the socio-historical reality that would make Black ASL possible? That is, what conditions might lead to the creation of a separate African American variety?

- ✓ Starting in 1869 in North Carolina and until 1978 in Louisiana, 17 states and the District of Columbia had separate schools or departments for Black deaf children
- ✓ A mix of teachers: some Black deaf signers, some Black hearing non-signers, some White deaf signers
- ✓ Some children from signing, Deaf families

Possible Features of Black ASL

Two-handed vs. one-handed signs	Size of the signing space
Forehead location vs. lowered	Incorporation of AAE into signing
Use of repetition	Amount of mouthing
Use of role shifting (CA/CD)	Vocabulary differences

So.....

Without quantitative sociolinguistics, we run the risk of missing

- The nature of the system
- How the system changes
- How varieties come about

If quantitative analysis did NOT reveal facts about how the system works and how it comes about and changes, then it would simply be an interesting parlor game; but it clearly does, so we need to pay attention to what it tells us about the claims we make about structure and use and what we include in our model of language.

In addition, as Hazen (2007: 88) observes, quantitative sociolinguistics has produced important changes in linguistic practice in general: " It is more common today by claims to be supported by empirical evidence; in addition claims of more or less now require statistical support."

And...

We run the risk of missing the community, i.e the heart of the sign languages that we study.

I leave you with data clips from that community.

Thank you to the TISLR organizers for inviting me, to the interpreters, and to Bob Bayley, Paul Filiatreault, and Viola Kozak. For works cited, contact me at ceillucas@aol.com