

# Variation in Sign Languages: Recent Research on ASL and Beyond

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## Abstract

This article summarizes early approaches to sociolinguistic research and the factors that condition variation in sign languages. The article then examines the methodological issues that arise in the study of sign languages before discussing recent research on variation in several different sign languages and dialects including Black ASL, Australian Sign Language, New Zealand Sign Language, and Italian Sign Language. This research shows that sign languages, like spoken languages, are subject to a wide range of internal and external constraints, some of which are particular to sign languages. We conclude with suggestions for future research.

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Since Stokoe's (1960) pioneering work, linguists have recognized that natural sign languages are autonomous linguistic systems, structurally independent of the spoken languages with which they may co-exist in a given community. This recognition has been followed by extensive research into different aspects of American Sign Language (ASL) structure and accompanied by the recognition that, as natural sign languages are full-fledged autonomous linguistic systems shared by communities of users, the sociolinguistics of sign languages can be described in ways that parallel the description of the sociolinguistics of spoken languages.

Systematic research on variation in sign languages began in the 1960s with Carl Croneberg's two appendices to the Dictionary of American Sign Language (DASL) (Stokoe et al. 1965) and continued in the 1970s in studies by Battison (1978), Woodward (1973, 1976), and others. Reviews of this early work are provided in Lucas et al. (2001a), Lucas and Bayley (2010), and Bayley and Lucas (forthcoming). In this paper, we first outline the general features that characterize variation in sign languages. We then focus on several studies that highlight the main issues and reflect the changing perspective on the nature of sign languages: McCaskill et al.'s (2011) study of the variable lowering of signs such as KNOW<sup>1</sup> in Black ASL, the variety that developed in the African American Deaf community, Schembri et al.'s (2009) study of the same variable in Australian and New Zealand Sign Languages, Geraci et al.'s (2011) study of lexical variation in Italian Sign Language (LIS), and Geraci and Bayley's (2011) study of variation in the position of wh- signs in LIS.

## *Regional and Social Variation*

Sign languages, like spoken languages, exhibit both regional and social variation. This variation has been described mainly at the phonological and lexical levels, and to a much lesser extent at the morphological and syntactic levels.<sup>2</sup> Table 1 compares spoken and sign language variability and shows that the same kinds of variation found in spoken languages

**Table 1. Variability in spoken and sign languages.**

Variable unit	Example	
	Spoken languages	Sign languages
Features of individual segments	Final consonant devoicing, vowel nasalization, vowel raising and lowering	Change in location, movement, orientation, handshape in one or more segments of a sign
Individual segments deleted or added	-t, d deletion, -s deletion, epenthetic vowels and consonants	Hold deletion, movement epenthesis, hold epenthesis
Syllables (i.e., groups of segments) added or deleted	Aphesis, apocope, syncope	First or second element of a compound deleted
Part of segment, segments, or syllables rearranged	Metathesis	Metathesis
Variation in word-sized morphemes or combinations of word-sized morphemes (i.e., syntactic variation)	Copula deletion, negative concord, <i>avoir/être</i> alternation, lexical variation	Null pronoun variation, lexical variation
Variation in discourse units	Text types, lists	Repetition, expectancy chains, deaf/blind discourse, turn taking, back channeling, questions

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can also be found in sign languages. Specifically, the features of individual segments of signs can vary, individual segments and whole syllables can be deleted or added, and parts of segments or syllables can be rearranged. There can be variation in word-sized morphemes (i.e., lexical variation) or in combinations of word-sized morphemes (i.e., syntactic variation). Finally, there can be variation in discourse units. Phonological variation can be seen in the production of the component parts of signs such as handshape, location, palm orientation, number of articulators, non-manual signals, and segmental structure. For example, the ASL signs FUNNY, BLACK, and CUTE might be produced with the thumb extended or with the thumb closed; the ASL signs BORED and DEAF might be produced with the little finger extended or with the little finger closed; the ASL sign WEEK might be produced with the palm of the dominant hand facing upward or the palm facing downward; the ASL sign KNOW might be produced on the forehead or on the cheek.

Sign languages, then, demonstrate the same kind of variation found in spoken languages. However, two kinds of variation in sign languages seem to be artifacts of a language produced with two identical articulators (i.e., two hands as opposed to one tongue). That is, sign languages allow the deletion, addition, or substitution of one of the two articulators. Two-handed signs become one-handed (CAT, COW), one-handed signs become two-handed (DIE), and a table, chair arm or the signer's thigh may be substituted for the base hand in a two-handed sign (RIGHT, SCHOOL). In addition, one-handed signs that the signer normally produces with the dominant hand (i.e., the right hand, if the signer is right-handed) can be signed with the non-dominant hand. Research in ASL has shown that signers in different regions tend to favor different variants. For example, in Boston signers tend to favor the one-handed variant of signs that are traditionally produced with two hands, like DEER or WANT. Signers

in California, Kansas, and Louisiana, however, tend to favor the two-handed variants (Lucas et al. 2007). Variation is also allowed in the relationship between articulators, as in HELP, produced with an ASL A handshape (fist with thumb on the side of the index finger) placed in the upward-turned palm of the base hand. Both hands can move forward as a unit, or the base hand can lightly tap the bottom of the A handshape hand.

Also important are the constraints that operate on variation, which can be either linguistic or social. Table 2 shows the linguistic constraints on spoken and signed language variation. Constraints may be *compositional*, having to do with some feature of the variable sign itself, such as movement of the fingers or the number of fingers extended. For example, the sign FUNNY may allow the thumb to be extended but the fact that the fingers oscillate and that both the index and middle fingers are extended may influence whether the thumb gets extended. *Sequential* constraints are those that have to do with the immediate linguistic environment surrounding the variable sign, such as the handshape, location, or palm orientation of the sign immediately preceding or following the variable sign. Sequential constraints have always been very important in explaining variation in spoken languages and have been assumed to be as important in sign language variation as well. Many examples of handshape, location, and palm orientation assimilation are seen, such that the one handshape in the first person pronoun PRO.1 ('I'), with the thumb and all fingers except the index finger closed, may become an open eight handshape (all fingers open, pads of the middle finger and the thumb almost touching) in the phrase PRO.1 PREFER ('I prefer') or an F handshape (all fingers open, thumb tip and index tip contact) in the phrase PRO.1 CURIOUS ('I'm curious'), by assimilation with the handshapes of the predicates PREFER and CURIOUS. The same appears to be true with the variation in number of articulators described above, whereby the variable sign may be two-handed or one-handed depending on the number of hands in the preceding and following signs (McCaskill et al. 2011).

*Functional* constraints pertain to the role that the grammatical category of the sign plays in the variation. These functional constraints are being found to have a very strong role in sign language variation (Lucas and Bayley 2005). For example, the sign DEAF varies in its location, such that it can be produced starting at the ear and ending near the chin, starting at the chin and ending at the ear or as a single contact on the cheek. Figure 1a–c

**Table 2. Internal constraints on variable units.**

Constraint	Example	
	Spoken	Signed
Compositional	Phonetic features in nasal absence in child language	Other parts of sign in question (e.g., handshape, location, orientation)
Sequential	Following consonant, vowel, or feature thereof	Preceding or following sign or feature thereof
Functional	Morphological status of -s in Spanish -s deletion	Function of sign as noun, predicate, or adjective
Structural incorporation	Preceding or following syntactic environment for copula deletion	Syntactic environment for pronoun variation
Pragmatic	Emphasis	Emphasis (e.g., pinky extension)

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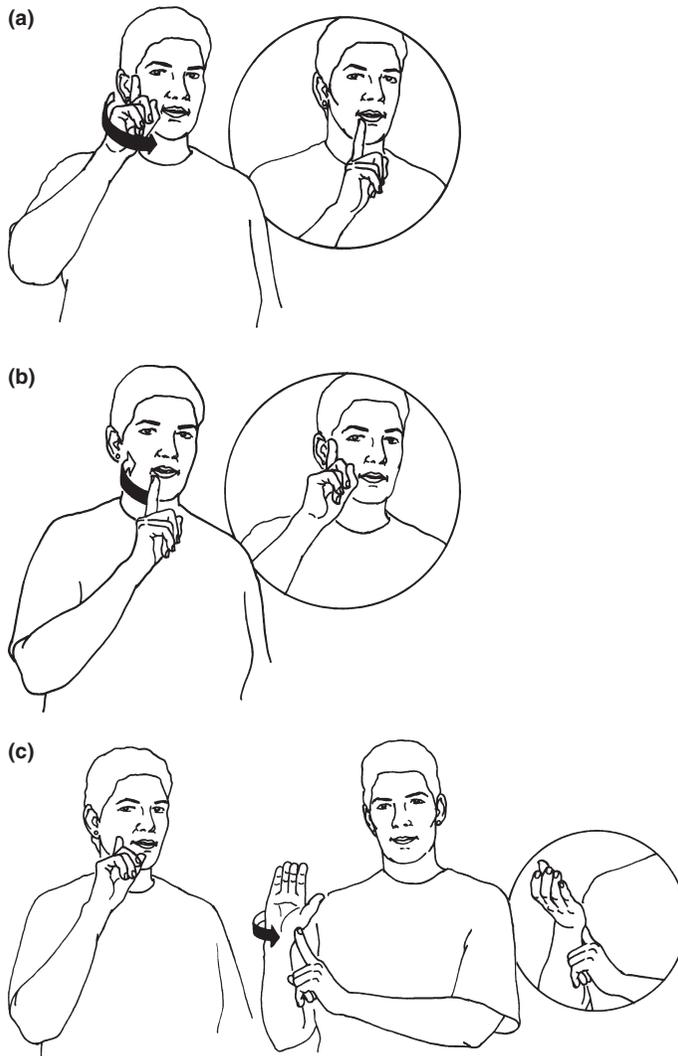


Fig 1. (a) DEAF, citation form (+CF). (b) DEAF, non-citation form 1 (-CF). (c) DEAF, non-citation form 2 (in the compound, DEAF^CULTURE).

illustrates the main variants of this sign. Earlier analyses explained this variation simply in terms of assimilation, i.e., the location of the preceding or following sign conditioned whether the sign DEAF would start at the ear or at the chin or contact the cheek. More recent research (e.g., Lucas et al. 2001a) has found that the grammatical category of the sign DEAF itself plays a central role in the variation, such that DEAF as a predicate ('I am deaf') tends to take the ear to chin form, while DEAF as a noun or adjective ('Deaf [people] understand', 'deaf cat') can be either the ear to chin or chin to ear form, and the sign DEAF in a compound sign such as DEAF^WAY or DEAF^CULTURE tends to be the form that contacts the cheek. Finally, *structural incorporation* has to do with the preceding or following syntactic environment surrounding the variable and *pragmatic* features such as emphasis may help explain the variation being observed.

Sign languages are also differentiated internally according to social criteria, in the same way that spoken languages are. That is, varieties of sign languages exist and the social factors that help define these varieties include both those that play a role in spoken language variation – region, age, gender, socioeconomic status, race – and others that are unique to language use in Deaf communities, such as the language policies implemented in deaf education, the home environment (e.g., Deaf parents in an signing home vs. hearing parents in a non-signing home), and the sightedness or not of the signer, as in the variety used by Deaf-Blind signers. This variety is known as Tactile ASL, used by Deaf-Blind people with the genetic condition Ushers Syndrome I. Individuals with this syndrome are born deaf and later, usually in their teen years, start losing vision in varying degrees due to retinitis pigmentosa. Crucially, most Deaf-Blind people in this category grow up using ASL and are fluent signers by the time they begin to lose their sight. A variety of ASL has emerged in this community that accommodates the loss of sight at all linguistic levels: phonological, morphological, syntactic, and discourse. One of the consequences of the loss of sight is that Deaf-Blind people no longer have access to the numerous ASL grammatical and discourse markers produced on a signer's face. Remarkably, these non-manual (facial) markers are produced on the hands in Tactile ASL. For example, the raised eyebrows required for yes/no questions or the nodding required for back channeling are produced manually (Collins 2004; Collins and Petronio 1998). In addition, research has demonstrated the existence of tactile varieties of other sign languages such as Swedish Sign Language (Mesch 2000) and Norwegian Sign Language (Raanes 2006).<sup>3</sup>

Lexical variation concerns different signs for the same concept. Regional differences have been described in British Sign Language (BSL), for example, between Reading and York for the signs LEARN, SUNDAY, and WHO (Deuchar 1984:131). Lexical variation has been studied in many languages including BSL (Kyle and Woll 1985), New Zealand Sign Language (McKee et al. 2008), Italian Sign Language (Geraci et al. 2011; Radutzky 1992), Dutch Sign Language (Schermer 1990), Flemish Sign Language (Vanhecke and De Weerd 2004), Swiss German Sign Language and Swiss French Sign Language (Boyes-Braem 1985), Brazilian Sign Language (Campos de Abreu 1994), and Australian Sign Language (Auslan) (Schembri and Johnston 2004, 2007). In addition, Schembri et al. (2010) have recently reviewed patterns of lexical variation, as well as other sociolinguistic variables, in British, Australian, and New Zealand Sign Languages.<sup>4</sup> Starting with the publication of the DASL by Stokoe et al. 1965, all researchers and community members whose goal has been to prepare dictionaries of their respective sign languages have had to confront significant lexical variation. This variation has most often resulted from the isolation of signing communities even within the geographic boundaries of a recognized country.

With respect of lexical variation in ethnic dialects, Woodward (1976), Aramburo (1989), and Lucas et al. (2001b) have examined differences between African American and White ASL signers in the United States, while Smiler and McKee (2006) have studied differences in White and Maori signing in New Zealand. Researchers have also examined gender variation in ASL and Irish Sign Language (Leeson and Grehan 2004; LeMaster 2006). Finally, Lucas et al. (2001a) examined the effect of social class on variation, with class defined according to Deaf community norms.

### *Methods*

Any account of variation in sign languages must include a discussion of how the data are collected. The main methodological issues that need to be considered when studying linguistic variation are:

1. defining and sampling a community;
2. describing natural language;
3. defining variables and constraints.

In studying communities of signers, however, each of these issues has a number of implications. We discuss each of the issues in turn.

#### DEFINING AND SAMPLING A COMMUNITY

The first issue, which is common to studies of variation in both sign and spoken languages, concerns sampling. The goal of all variation studies is to describe the patterns of variable linguistic structure within and across language communities. Whether the study is qualitative or quantitative, participants must be members of the communities whose language use is described. Further, quantitative sociolinguistic work that seeks to reach conclusions about language use in a community as a whole must ensure that its participants are as representative as possible of the entire community (Sankoff 1988). The language community may be defined in both linguistic and social terms. If the study finds that a group of ASL users have some aspect of their language in common, for example, if the constraints on a particular variable affect all members of the community in the same way, then this is evidence that the group is a linguistic community (Labov 1972b). When defining the language community in social terms, variation studies have taken two main approaches. One approach is to use broad social categories, like socioeconomic status and gender, to draw boundaries around sub-groups within a community (Labov 1966, 1972b). Another is to use community-based social networks. This latter approach looks at a community in terms of the number and nature of connections among individuals, in order to correlate these connections with patterns of language use (Labov 1972a; Milroy 1987). A researcher who employs either approach, however, has an explicit definition of the language community in terms of common social factors.

#### DESCRIBING NATURAL LANGUAGE

The second issue concerns the type of data analyzed. Studies of sociolinguistic variation differ in a fundamental way from formal studies of abstract linguistic competence: studies of variation are committed to studying language in context (Labov 1966, 1972b; Lucas 1995; Milroy 1987). Directly eliciting different variants of a sociolinguistic variable would defeat the purpose of studying how the social and linguistic environments of language use condition variation. The ideal would be to document the full range of the community's styles of language use, from formal lectures given to an audience of strangers to casual daily encounters with friends and acquaintances. In reality, this is impossible. Few people, if any, sit around waiting for linguists to come and record their conversations. Also, the camcorder would be distracting.

Despite these fundamental limitations on linguists' access to 'natural language use', studies such as Lucas et al. (2001a) and McCaskill et al. (2011) made methodological accommodations to gather conversations that were as natural as possible. The conversation types that were recorded differed on many dimensions: how well the participants knew one another, the degree to which the conversations were about language itself, the length of the conversations, and the presence or absence of the researchers during the videotaping. Each of these dimensions might have provided an environment that would affect variation. Therefore, the conclusions take into account these aspects of the conversations.

In McCaskill et al.'s (2011) study, for example, groups of signers were videotaped during one- to two-hour data collection sessions. These sessions were divided into three parts. The first consisted of approximately one hour of free conversation among groups of participants, without the researchers present. In the second part, participants were interviewed in depth by deaf researchers about their educational and linguistic backgrounds, social networks and patterns of language use. The final part involved eliciting lexical variants from the participants who had been interviewed.

#### DEFINING VARIABLES AND CONSTRAINTS

The third issue is a concern that what is being investigated is, in fact, a sociolinguistic variable. The hope is that we now know enough about the structure of the language under investigation to identify what varies, to describe this variation and to quantify it. The first steps in variation analysis are to define the variable and the envelope of variation. That is, what forms count as instances of the variable? Are the forms that vary indeed two ways of saying the same thing?

The studies described in the following section required, first, a consideration of what features were noticeably variable. These variables might be found at any level of linguistic structure, from phonology to discourse. For a quantitative study like McCaskill et al. (2011), the goal is to determine whether and to what extent these variables correlate with both linguistic and social factors.

An additional issue that arises early in a variation study concerns specifying the factors that may potentially influence a signer's choice of a variant. Lucas (1995), for example, investigated the potential effects of eight separate linguistic factors on the choice of a variant of DEAF. As it turned out, most of these factors proved not to be statistically significant. However, the labor of coding for many factors was not in vain. The study demonstrated that Liddell and Johnson's (1989) hypothesis that variation in the form of DEAF is influenced primarily by the location of the preceding sign is, at best, incomplete.

Another central theoretical issue for variation studies is the identification of internal constraints on the variables. As Labov states, the issue 'is to discover whatever constraints may exist on the form, direction or structural character of linguistic change' (1994: 115). Phonological constraints on the variables considered by Lucas et al. (2001a) could include the segmental phonological environment or suprasegmental, or prosodic, environment. Other linguistic constraints could be morphological, syntactic, or related to discourse topic or type of discourse.

As for social constraints, the researcher's knowledge of the community should inform what factors are considered in the model of variation. In McCaskill et al. (2011), for example, information about the history of Black deaf education in the United States was crucial both to the design of the study and to make sense of the findings.

Finally, data collection itself presents a methodological problem. While one goal of sociolinguistic research is to base conclusions on conversation that is as 'natural' as possible, one aspect of the basic method required for the careful study of natural language use impinges on this goal. That is, the conversation being studied needs to be recorded, and yet the fact that the conversation is being recorded makes it less likely to be close to everyday language. Labov (1972b) called this problem the 'Observer's Paradox'. In Deaf communities, this problem may be magnified. Video recording is more intrusive than audio recording. Equally important is the issue of anonymity. While spoken voices cannot easily be connected to a face or a name, except by the researchers, faces on a video

are not anonymous. The Deaf community is small, and signers may be concerned that what they say on videotape will be seen by others in the community and understood out of context. On video, complete anonymity is impossible. Hence, researchers need to be very clear in describing to participants how data will be used.

### *Recent Work*

#### BLACK ASL

In recent years, several projects have shed new light on the nature of variation in sign languages. One such project by McCaskill et al. (2011) examined the variety of ASL known as Black ASL. The Black ASL project began in 2007 with two goals: (i) to determine if specific linguistic features could be identified to characterize the signing of the Black Deaf community as a distinct variety of ASL, and (ii) to describe the socio-historical reality that would make the emergence of this variety possible. Formal education of deaf children began in the United States with the founding of the American School for the Deaf in 1817 and schools for deaf children were never formally segregated in the North. Education was not allowed for Black deaf children in the South until 1869, when the first school was opened in Raleigh, North Carolina. Sixteen other southern states and the District of Columbia established schools for Black deaf children, the last one being Louisiana in 1938. Most resisted the integration mandated by the U.S. Supreme Court in *Brown v. Board of Education* in 1954, finally allowing desegregation in the mid-1960s, with Louisiana desegregating only in 1978. This socio-historical reality allowed for the emergence of a distinct variety of ASL. The project team filmed free conversations and interviews with a total of 96 signers in 6 of the 17 states – North Carolina, Alabama, Arkansas, Texas, Louisiana and Virginia – and these data were used for the linguistic analysis. The signers included individuals over the age of 55 who attended segregated schools, and individuals under the age of 35, who attended integrated and/or mainstreamed schools, with both deaf and hearing White classmates. As seen in Figure 2, the analysis identified a number of linguistic features that distinguish this variety.

Some two-handed signs can be signed with one hand, such as *DON'T-KNOW*, *TIRED*, and *HAVE*, but we found that Black signers prefer two-handed signs. The usual signing space is between the shoulders and from the top of the head to the waist, but Black signers regularly use a larger signing space. Black signers also use significantly more

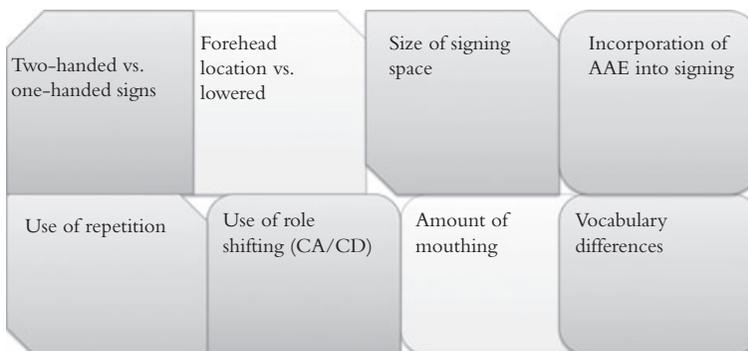


Fig 2. Features of Black ASL.

repetition of single signs or phrases than do White signers. The younger Black signers incorporate features of spoken African American English into their signing and there are many instances of lexical variation with both the older and younger signers. We compared the use of role shifting in Black and White signers but found very little difference.

As for the lowering of signs, there are a number of signs in ASL like KNOW which are produced at the level of the forehead in citation form, i.e., the form of the sign that would appear in a dictionary, but which can also be produced at a lower level, for example, on the cheek, in neutral space. Figure 3a shows TEACHER in its citation (non-lowered) form. Figure 3b shows the same sign in its lowered form.

The lowering of a sign can be affected by both linguistic and social factors. McCaskill et al. analyzed 877 examples and found that the grammatical category to which a sign belongs is the most important linguistic factor. Compounds, nouns, and verbs tend not to be lowered, while prepositions and interrogatives may be lowered. Whether the preceding sign contacts the head or the body also significantly affects the observed variation. When the preceding sign contacts the body, a signer is more likely to choose the lowered variant. When the preceding sign is at the level of the head with no contact, a signer is less likely to choose the lowered form.

Social factors also significantly affect Black signers' choices between the citation and the lowered variants. In comparison to African Americans in other states, signers in Texas favor the use of the lowered variant, while signers in Arkansas and Louisiana are the most likely to select the citation form. Signers in the other three states – Alabama, North Carolina, and Virginia – were in the middle.



Fig 3. (a) Teacher (citation form): initial, middle, and final. (b) Teacher (lowered form): initial, middle, and final.

Age also significantly affected the choice between the two variants in the expected direction. Younger signers, who attended school after integration, were more likely to select a lowered form than older signers who had attended segregated schools.

McCaskill et al. (2011) showed that Black ASL is a distinct variety of ASL and also that, as a result of integration and mainstreaming, the variety is changing. One striking finding is that the Black signers, both young and old, consistently use more traditional and standardized forms of signs, directly challenging perceptions that Black signing is somehow 'inferior'.

#### AUSTRALIAN SIGN LANGUAGE AND NEW ZEALAND SIGN LANGUAGE

Variation in location has also been studied in Australian (AUSLAN) and New Zealand Sign Languages (NZSL) (Schembri et al. 2009). With 2667 examples from AUSLAN and 2096 from NZSL, the researchers showed that, as in ASL, variation in location in a similar class of signs in AUSLAN and NZSL is constrained by a complex array of social and linguistic factors, although citation forms are more common in both AUSLAN and NZSL than in ASL. In all three languages, we see the influence of the preceding and following signs. Nevertheless, as might be expected when dealing with different languages, the details differ. In addition, as in ASL, grammatical category influences variation in both AUSLAN and NZSL, although the influence of grammatical category interacts with lexical frequency in the southern hemisphere sign languages. Of particular interest are the results for age in AUSLAN and ethnicity in NZSL. Just as in ASL, younger AUSLAN signers are less likely to use citation forms than their elders. Moreover, in NZSL, minority signers, in this case Maori, are less likely to use non-citation forms than Deaf New Zealanders of European descent.

#### ITALIAN SIGN LANGUAGE

Recently, a team led by Caterina Donati, Anna Cardinaletti, Carlo Cecchetto, and Carlo Geraci set out to investigate variation in Italian Sign Language (*Lengua dei Segni Italiana*, LIS). Working in a manner similar to Lucas et al. (2001a), they collected data from 165 Deaf signers in 10 Italian cities ranging from Turin and Milan in the north to Bari in the south. To date, they have analyzed lexical variation (Geraci et al. 2011), the placement of *wh*-signs (Geraci and Bayley 2011), and a non-manual feature, eyebrow raising (Conte et al. 2010).

To investigate lexical variation, Geraci et al. (2011) presented signers with 42 pictures to elicit signs for colors, family members, and months, all of which have been reported to show variability. They also elicited signs for 'bank', 'goat', 'color', and 'chocolate' because these signs have also been reported to exhibit social or regional variability. The researchers also elicited a variety of signs including compounds such as 'vending machine', initialized signs, pictures for which there is no known sign in LIS (e.g., 'flamingo'), and objects referred to by a classifier handshape (e.g., 'bottle'). Finally, some objects were pictured because the signs for the objects depicted are considered especially prone to phonological variation and/or diachronic change.

Geraci et al. (2011) analyzed data from 128 of the 165 signers in the LIS corpus. Variants were divided into national variants, which were found in every city, and local variants, generally found in only one or two cities. Overall, signers produced far more national variants (85.4%) than local variants (14.6%). Interestingly, multivariate analysis

indicated that older signers were more likely to produce local variants, as were signers in the north and the south.

Researchers have also examined syntactic variation in the LIS corpus. Recently, Geraci and Bayley (2011) reported results from a study of variation in the position *wh*- signs. Previous work, based on grammaticality judgments by native signers, indicated that there is considerable variability in the position of *wh*- signs (Cecchetto et al. 2009), which may come before the predicate, after the predicate, or which may be reduplicated. For example, 1a, 1b, 1c below were produced by a single signer during the course of an elicitation task concerning an auto accident report:

- 1a. HAPPEN WHERE  
'Where did that happen?'
- 1b. IX-2 WHERE BUMP  
'Which part of the care did you bump?'
- 1c. IX-2 WHERE CRASH WHERE  
'Where did the accident happen?'

Geraci and Bayley (2011) performed multivariate analysis of 646 signs elicited in several tasks that required the use of numerous questions. Overall, they found that slightly more than 60% of the *wh*- signs analyzed came after the predicate. The position of *wh*- signs was significantly constrained by both clause-type (with direct questions more likely to come after the predicate) and grammatical function (with objects more likely than subjects or adjuncts to come after the predicate than subjects). Interestingly, results for age and education, which showed evidence of interaction, suggest that we may be looking at a late stage of a change in progress. Signers over 55 with relatively low levels of education were most likely to place the *wh*- sign before the predicate, the position that is congruent with Italian, while signers under age 55 with relatively high levels of education were less likely to place the *wh*- sign before the predicate. The results, then, suggest that in at least one respect, LIS is becoming less like spoken Italian, a development that may be partially attributed to the increasing awareness among younger educated signers of the distinctiveness of LIS and Deaf culture.

Finally, Conte et al. (2010) have used the LIS corpus to examine eyebrow raising. They analyzed 410 examples extracted from the narrative production of 16 signers in Turin. Their results showed that, as in ASL, eyebrow raising is widely used in a number of different constructions including yes/no questions, *if* clauses, relative clauses, topicalized elements, and subordinate and complement clauses, all of which had been previously documented in the literature. They also identified three uses of eyebrow raising that had previously gone unnoticed: broad focus, contrastive focus, and emphatic discourse attitude.

Clearly, data from additional signers in other cities need to be analyzed, but the results of the preliminary study are intriguing. Conte et al. (2010) found that young signers tend to use eyebrow raising to mark broad focus more than older signers while older signers tend to use eyebrow raising as an attitude marker.

To summarize, recent research on a variety of ASL, Black ASL, and several sign languages that had not previously been the objects of variationist study has shown convincingly that variation in sign languages can be studied in much the same way as variation in spoken languages. Importantly, the large-scale corpora gathered for studies such as those reviewed here provide a major resource for future work on a range of variables as well as

on features that may distinguish languages in the visual–gestural modality from languages in the aural–oral modality.

### Conclusion

In their study of sociolinguistic variation in ASL, Lucas et al. (2001a) raised two main questions: ‘(i) Can the internal constraints on variation such as those defined and described in spoken languages be identified and described for ASL? and (ii) Can the external social constraints on variation such as those defined and described in spoken languages be identified and described for ASL?’ (192). Based on the analysis of approximately 10 000 tokens from more than 200 signers living across the United States, they were able to answer both questions affirmatively. Subsequent work has confirmed those answers, not only for ASL, but also for the sign languages of the Deaf communities in Australia, Italy, New Zealand, and elsewhere. That is, research has shown convincingly that sign languages, like spoken languages, are characterized by structured or orderly heterogeneity (Weinreich et al. 1968:100). Nevertheless, a great deal remains to be done. Thus, far researchers have conducted a number of large-scale studies involving signers in many different sites. These studies represent a necessary first step in examining sociolinguistic variation in any widely used sign language. However, we do not yet have the kind of in-depth studies of particular communities that have long been typical of sociolinguistic studies of spoken languages. In addition, although researchers have examined a number of variables at the phonological, syntactic, and lexical levels, many additional variables remain to be explored. Finally, there have been no sociolinguistic studies of many well-documented sign languages. Research conducted during the past 15 years has established a good foundation for further work on variation in sign languages. However, to gain a full picture, we need studies of additional variables and additional languages as well as detailed studies of particular Deaf communities.

### Short Biographies

Ceil Lucas is a Professor of Linguistics at Gallaudet University and Editor of *Sign Language Studies*. She has conducted extensive sociolinguistic research on ASL as well as research on African American English. Her books include *Sociolinguistic Variation in American Sign Language* (2001, with Robert Bayley and Clayton Valli), *The Linguistics of American Sign Language*, 4th ed. (2005, with Clayton Valli and Kristen Mulrooney), and *The Hidden Treasure of Black ASL: Its History and Structure* (2011, with Carolyn McCaskill, Robert Bayley, and Joseph Hill).

Robert Bayley is a Professor of Linguistics at the University of California, Davis. He has conducted research on variation in English, Spanish, ASL, and Chinese, as well as ethnographic research in Latino communities in California and Texas. His books include *Language as Cultural Practice: Mexicanos en el norte* (2002, with Sandra Schecter) and *Sociolinguistic Variation: Theories, Methods, and Applications* (2007, ed. with Ceil Lucas).

### Notes

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<sup>1</sup> English glosses of signs are typically written in upper case. KNOW, for example, refers to the ASL sign rather than the English word.

<sup>2</sup> The term *phonology* is used in sign linguistics to describe the same area of linguistics that it refers to in spoken language studies, i.e., the study of the basic units of the language, in this case the handshape, location, palm orientation, movement, and facial expressions.

<sup>3</sup> Throughout this article, we follow the current convention of using *Deaf* to refer to people who are culturally Deaf, and lower-case *deaf* to refer to audiological status. People who are deaf may or may not be culturally Deaf.

<sup>4</sup> Australian Sign Language and New Zealand Sign Language are both descendants of BSL. Despite the fact that they developed in English-speaking countries, they are unrelated to ASL.

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