

## Negative incorporation in French and American sign language<sup>1</sup>

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### ABSTRACT

This paper examines Negative Incorporation in various lects of two historically related sign languages, French Sign Language and American Sign Language. Negative Incorporation not only offers interesting insights into the structure of French and American Sign Language, but also into the descriptive and explanatory power of variation theory. By viewing Negative Incorporation in a dynamic framework, we are able to describe the variable usage of Negative Incorporation as a phonological process in French Sign Language and as a grammatical process in American Sign Language, to argue for possible early creolization in American Sign Language, to show the historical continuum between French Sign Language and American Sign Language despite heavy restructuring, and to demonstrate the influences of social variables on language variation and change, especially illustrating the progressive role of women in sign language change and the conservative forces in French Sign Language as compared with American Sign Language. (Sociolinguistics, sign language, creolization, linguistic changes.)

### INTRODUCTION

In this paper, we will examine Negative Incorporation in various lects of two historically related sign languages, French Sign Language (FSL) and American Sign Language (ASL). The framework for the analysis is the dynamic sociolinguistic paradigm discussed by Bailey (1973) and others (Bickerton 1975, Fasold 1975). This will allow us to demonstrate the ways in which Negative Incorporation reveals insights into the dynamic nature of language variation in FSL and ASL and into the power of social variables in influencing language use.

Before discussing informants, data, and analysis, it will be useful to review briefly the historical relationship between FSL and ASL. ASL is historically

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related to the French Sign Language of the early nineteenth century. In 1816, T. H. Gallaudet, a hearing American who had learned FSL, and L. Clerc, a deaf Frenchman, brought FSL to the US. Popular opinion states that ASL later developed from FSL, but there is information that suggests that FSL was creolized with a sign language or languages already existing in the US before 1816 (Woodward 1976a, b).

It has been hypothesized (Woodward 1976b) that there were sign languages in use in the US before 1816, that is before FSL was brought to the US. Because of poor transportation and the absence of any schools for the deaf in the US,<sup>2</sup> these languages probably had great regional variations and more than likely were mutually unintelligible. It appears that FSL was creolized with existing varieties of sign language in the US, producing modern ASL. Glottochronological procedures (cf. Gudschinsky 1964) show extremely large lexical differences between modern FSL and modern ASL, even though they have been separated for only 160 years.

As Hymes (1971) points out, glottochronology has many problems but has been useful in arguing for possible earlier creolization of a language (cf. Hymes 1971; Frake 1971; Southworth 1971). 'The glottochronological distinctiveness of pidgins and creoles was first discovered by Hall (1959), who showed that Neo-Melanesian had diverged from its base language, English, at a rate far exceeding that normally found. Whereas glottochronology normally errs in the direction of underestimating the time-depth of divergence between languages, here it greatly overestimates the time-depth' (Hymes 1971: 198).

Signs are compatible to words in oral languages and rates of change of basic signs in a sign language are comparable to what has been found for oral languages (cf. Gudschinsky 1964). For example, Gelj'man (1957) found a 97.5% rate of cognates (a hypothetical range of 14-130 years at 90% confidence) for 70 pairs of Russian signs in a real 122-year time span. Woodward (1976b) in an analysis of 423 ASL signs from before 1918 showed a 99% rate of cognates and a hypothetical time span of 5-41 years, where the actual time span is at least 58 years. Woodward (1976b) also performed a glottochronological analysis of a 1913 film of Hotchkiss, who as a young boy signed often with Clerc, who brought FSL to the US. There was a 99.6% rate of cognates for 251 pairs of signs. This is a hypothetical time separation of 9 years, where the time span is at least 63 years.

However, when we compare modern FSL and modern ASL with an actual separation of around 160 years, we find a totally different picture. Woodward (1976b) found that with 872 modern FSL and modern ASL signs the rate of cognates was only 57.3%. This would hypothetically date the arrival of FSL in America between 132 BC and AD 163 with a 90% level of confidence. This is a 1,600-1,900-year discrepancy. Even limiting the analysis to words chosen from

[2] See Stokoe (1960) and Croneberg (1965) for the importance of residential schools in maintaining cultural solidarity in the deaf community.

the Swadesh word list, Woodward (1976b) found only a 39% rate of cognates between modern FSL and modern ASL. This would hypothetically date the arrival of FSL in the US even earlier, between 707 BC and 317 AD at a 90% level of confidence.

These great differences may be explained through creolization, since massive changes occurring in the process of creolization can happen much faster than natural internal language change. The presence of fairly substantial amounts of restructurings like metathesis also supported the theory of early creolization of FSL upon its arrival in the US.

#### DATA AND INFORMANTS

ASL verbs can be negated by the addition of the ASL sign NOT before the verb or through a Negative suprasegmental facial expression. Several verbs in ASL can also be negated in another way, called Negative Incorporation. Negative Incorporation involves a bound outward twisting movement of the moving hand(s) from the place where the sign is made. Five ASL verbs that variably undergo Negative Incorporation were researched by Woodward (1973, 1974): GOOD, HAVE, KNOW, LIKE, WANT. This paper tests FSL cognates for these same five verbs to determine if FSL also has a Negative Incorporation rule similar to ASL.

Data for this study was collected from 144 American deaf signers<sup>3</sup> in 1972 by Woodward and from 60 French deaf signers during the summer of 1975 by Woodward and DeSantis. There were 108 deaf informants from the northeastern US (Washington, DC, Maryland, and New York) and 36 from the northwestern US (Montana and Washington). The American deaf informants were selected according to three social factors: whether or not they had deaf parents, whether they learned signs before or after the age of six, and whether or not they attended any college. Of the 108 informants from the northeast, 27 had deaf parents and 81 had hearing parents, 56 learned signs before the age of six and 52 learned signs after the age of six, 44 had attended some college and 64 had attended no college. Of the 36 northwestern informants, 6 had deaf parents and 30 had hearing parents, 24 learned signs before the age of six and 12 learned signs after the age of six, and 17 had attended some college, while 19 had attended no college.

The 60 French deaf informants for this study were chosen primarily on the basis of region. 12 informants were from Paris, 10 from Toulouse, 23 from Albi, and 15 from Marseilles. Nine of the informants had deaf parents and 51 had hearing parents. We were not able to obtain information on the age of sign language acquisition for all informants. The variable of college education is totally superfluous for French informants, since French deaf people are prohibited from attending any college in France.

[3] Data was also collected from 33 hearing signers, but it is not included in this study.

TABLE 1. *Negative Incorporation for American signers*

Lect	HAVE	LIKE	WANT	KNOW	GOOD	Northeastern	Northwestern
1	+	+	+	+	+	17	12
2	-	+	+	+	+	23	14
3	-	-	+	+	+	50	7
4	-	-	-	+	+	10	1
5	-	-	-	-	+	8	2
6	-	-	-	-	-	0	0
Total						108	36

AMERICAN SIGNS

The five American verbs found to undergo Negative Incorporation were tested for the northeastern and northwestern informants in two studies (Woodward 1973, 1974). Responses of informants were found to be implicationaly ordered (cf. Bailey 1973) as shown in Table 1 with 97% scalability for northeastern informants.

*Features conditioning the variation in ASL.* We have seen that the Negative Incorporation rule applies for signers first in the environment of GOOD, second in the environment of KNOW, third in the environment of WANT, fourth in the environment of HAVE.

We hypothesize that there are phonological<sup>4</sup> features that are similar in these five verbs, and that are conditioning the variation. Table 2 shows the phonological features necessary to distinguish these verbs.

From Table 2 we see that it is possible to weight these features, assigning  $\alpha$  to that feature that influences operation of the rule most frequently. To successively less important environmental features we can assign  $\beta$ ,  $\gamma$ , etc. Table 3 shows the proper weighting of features.

TABLE 2. *Features on Negative Incorporating verbs*

Feature	HAVE	LIKE	WANT	KNOW	GOOD
Face	-face	-face	-face	+face	+face
Trunk	+trunk	+trunk	-trunk	-trunk	-trunk
Outward movement	-out	+out	-out	-out	+out

[4] Stokoe (1960) uses the term *cherology* defined as 'systematic formational system analogous to but not dependent on the phonological component of oral languages'.

TABLE 3. *Weighted features on Negative Incorporating verbs*

Feature	HAVE	LIKE	WANT	KNOW	GOOD
Face				$\alpha$ face	$\alpha$ face
Trunk			$\beta$ -trunk	$\beta$ -trunk	$\beta$ -trunk
Outward movement		$\gamma$ out			$\gamma$ out

We are now only beginning to approach a natural phonology of sign languages based on physiological (Battison 1974; Siple 1973), developmental (McIntire 1974), and historical (Frishberg 1975; Woodward & Erting 1975) principles. Rationale for these features is tentative but in line with research in naturalness in sign phonology.

Negative Incorporation requires an outward twisting movement of the hand(s) from the place where the sign is made. These negative signs require more complex movement than their positive counterparts. Siple (1973) has shown that because of constraints on visual perception, signs on the *face* can allow much more complex hand configurations and movements than signs made on other parts of the body. Signs made on the *trunk* appear to allow the least complex configurations and movements. Signs already containing an *outward* movement in their positive form are also favored for Negative Incorporation because of economy of effort.

*Correlation of Linguistic and Social Variation in American Signers.* The use of Negative Incorporation for American signers does not correlate with the variables of parentage, age of sign language acquisition, or college education.<sup>5</sup> However, the relative use of Negative Incorporation does correlate with region. Table 4 shows the distribution of northeastern and northwestern informants in lectal patterns.

TABLE 4. *Membership in lects for American informants by region*

Lects	Northeastern	Northwestern
1-2	40 (37%)	26 (72.2%)
3-6	68 (63%)	10 (27.8%)

[5] Other ASL grammatical variables, e.g. Agent-Beneficiary Directionality, have been shown to correlate strongly with these variables.

A chi square test of the data shows a dependency relationship at  $p < 0.005$  ( $\chi^2 = 11.99$ ,  $df = 1$ ) for region. Northwestern signers pattern primarily in lects 1-2, which use Negative Incorporation in the most environments. North-eastern signers pattern primarily in lects 3-6 which use less Negative Incorporation. This difference may be due to the fact that there is considerably more in Washington D.C., because of Gallaudet College, to modify one's signing to approximate English more closely. As signing approaches English, it loses Negative Incorporation. Hearing signers also use significantly less Negative Incorporation than deaf signers ( $p < 0.005$ ,  $\chi^2 = 10.01$ ,  $df = 1$ , Woodward 1974).

FRENCH SIGNS

The five French cognates were tested to see if they underwent Negative Incorporation. With the exception of GOOD, all cognates did undergo variable Negative Incorporation. The implicational pattern of the four verbs was the same for French signers as for American signers. With 4 signs and 60 informants there was a total of 240 responses. There were 14 exceptions to this implication, yielding a 5.8% rate of exception or a 94.2% rate of scalability. Table 5 shows the pattern and the number of informants in each lect.

TABLE 5. *Negative Incorporation for French signers*

Lect	HAVE	LIKE	WANT	KNOW	Number
1	+	+	+	+	21
2	-	+	+	+	26
3	-	-	+	+	4
4	-	-	-	+	6
5	-	-	-	-	3
Total					60

There is an interesting problem with the data. If Negative Incorporation in FSL and ASL has the same basic patterns of variation in four verbs, why is there the problem of GOOD and BAD? Americans use Negative Incorporation categorically with GOOD to produce BAD, but French signers categorically do not use Negative Incorporation with GOOD. The FSL sign BAD is not formationally related to GOOD; it is a completely separate lexical item.<sup>6</sup>

We hypothesize that Negative Incorporation began in FSL before 1816 as a process of phonological assimilation, affecting in particular the signs KNOW, WANT, LIKE, and HAVE, in that order. When FSL was brought to America

[6] FSL BAD is cognate with ASL WORSE, the only difference being that many French signers do not have assimilated handshapes for the sign, while American signers do.

and mixed or creolized with existing varieties of sign language in the US, Negative Incorporation was restructured as a grammatical process affecting the same four verbs and later GOOD in ASL. Let us look at this hypothesis in a little more detail.

Negative Incorporation is a phonological process of FSL. Word order in old and modern FSL is Verb + NOT. FSL NOT is produced in neutral space in front of the body with a G handshape (index finger extended from the first). The index finger points upward and the palm is outward from the body. The G hand moves repeatedly from side to side. In Negative Incorporation, FSL NOT assimilates location and handshape to that of the preceding verb sign and loses its movement. This results in an outward twisting movement (to obtain the outward orientation of FSL NOT) from the place where the verb sign is made. Thus these negated signs have the same phonological structure in FSL and ASL. However, assimilation adequately describes the process of Negative Incorporation in FSL but not in ASL. The ASL sign NOT is a completely distinct lexical item; ASL Negative Incorporation cannot be derived from it through formational assimilation.

This assimilation began affecting FSL verbs KNOW, WANT, LIKE, HAVE in that order before 1816. Otherwise, there could be no Negative Incorporation in ASL, since ASL NOT has no formational relationship to FSL NOT. ASL NOT probably came from some sign variety in America, since old and modern FSL do not have cognates for ASL NOT. ASL NOT may have been in competition for a time with FSL NOT in America, however ASL NOT appears to have won fairly quickly. The assimilated Negative forms of KNOW, WANT, LIKE, and HAVE remained as single units in ASL.

These lexical units became generalized into a grammatical rule in ASL with the Negative Incorporation of ASL GOOD into ASL BAD during the creolization of FSL and existing varieties of signing in the US. FSL and ASL GOOD are cognates. FSL BAD became ASL WORSE. Creolized ASL then had no single lexical unit for BAD or this unit lost in competition with BAD as a Negative Incorporation of GOOD. GOOD then gradually moved to its appropriate place in the implicational pattern because of its phonological characteristics. Finally, Negative Incorporation of ASL GOOD has become categorical.

Further support for the salience of the Negative Incorporation grammatical rule in ASL comes from observation of children's signing in which it is overgeneralized. There have been reported overgeneralizations by a child who already had the full implication. This child used the overgeneralized form \*DON'T-LOVE.<sup>7</sup> It is also interesting to note that hearing signers, once they realize that Negative Incorporation can apply to several verbs in ASL, begin making hypercorrections, e.g. \*DON'T-THINK.

*Features conditioning the variation in FSL.* Because the implicational patterns

[7] We would like to thank Dennis Cokely for pointing out this example to us.

of variation were the same for the signs that underwent Negative Incorporation in both French and American Sign Language, the same weighted features can be postulated for both the French and American signs.<sup>8</sup> This strengthens the argument for the naturalness of the phonological features that condition the variation.

*Correlation of linguistic and social variation in French signers.* The use of Negative Incorporation for French signers does not correlate with the variables of parentage or region. However, the relative use of Negative Incorporation in FSL does correlate with sex. Table 6 shows the distribution of male and female French informants in lectal patterns.

TABLE 6. *Membership in lects for French informants by sex*

Lects	Male	Female
1-2	27 (69.2%)	20 (96.2%)
3-5	12 (30.8%)	1 (4.8%)

A chi square test of this data reveals a dependency relationship at  $p < 0.05$  ( $\chi^2 = 4.01$ ,  $df = 1$ ) for sex. Female signers use more Negative Incorporation than male signers. This is an interesting development, since this is the first time a sex difference has been demonstrated empirically for a sign language. This sex difference in FSL patterns very nicely with what is known about sex differentiation in oral languages. Labov (1972) points out that women are generally ahead of men in relation to linguistic change. This is exactly what we find here. Negative Incorporation in FSL is still a type of assimilation for French signers; it is a type of language change. Since women are using more negatively assimilated forms than men, they are using new linguistic forms more than males.

CONCLUSION

This paper has examined the process of Negative Incorporation in both French and American Sign Language. The patterns of variability were shown to be the same for the signs KNOW, WANT, LIKE, and HAVE. For the 144 American signers and the 60 French signers: (1) signs made on the face undergo Negative Incorporation more often than signs that are made elsewhere; (2) signs that are not made on the trunk undergo Negative Incorporation more often than signs that are

[8] The fact that French GOOD does not undergo Negative Incorporation does not affect the relative weightings of features.



made on the trunk; (3) signs containing an outward movement in their positive forms undergo Negative Incorporation more often than signs that do not have an outward movement.

GOOD undergoes categorical Negative Incorporation in ASL, while no French signers use Negative Incorporation with GOOD. We have hypothesized that this difference is due to early creolization of ASL. This creolization also restructured Negative Incorporation from phonological assimilation in FSL to a grammatical rule in ASL.<sup>9</sup>

The amount of Negative Incorporation varied with social background factors of signers. French signers used less Negative Incorporation than American signers, since French signers had categorical absence of Negative Incorporation with GOOD. Among French signers, women used more Negative Incorporation than men. Among American signers, northwestern signers used more Negative Incorporation than northeastern signers. The trend for French signers to use historically more conservative forms more often than Americans was also found in earlier studies by Woodward (1976a) and Woodward & DeSantis (1975). The fact that French women signers use more negatively assimilated forms than French men follows the expected situation that women are generally ahead of men in relation to linguistic change. Northeastern signers may use less Negative Incorporation than northwestern signers, because of Gallaudet College's pressure on eastern signers to approximate English in their signing.

Negative Incorporation not only offers interesting insights into the structure of FSL and ASL, but also into the descriptive and explanatory power of variation theory. By viewing Negative Incorporation in a dynamic framework, we are able (1) to describe the *variable* usage of Negative Incorporation as a phonological process in FSL and as a grammatical process in ASL, (2) to show the historical continuum between FLS and ASL despite heavy restructuring, and (3) to demonstrate the influences of social variables on language variation and change, especially illustrating the progressive role of women in sign language change and the conservative forces in FSL as compared with ASL.

## REFERENCES

- Bailey, C. (1973). *Variation and linguistic theory*. Washington, D.C.: Center for Applied Linguistics.  
 Battison, R. (1974) Phonological deletion in American Sign Language. *Sign Language Studies (SLS)* 5. 1-19.  
 Bickerton, D. (1975) *Dynamics of a creole system*. New York: Cambridge University Press.

[9] The restructuring of a grammatical variation to a phonological variation occurs in natural language change in oral languages, e.g. is deletion in Black English (Fasold 1976). Since phonology is more subject to change than grammar, this situation is expected. However, the restructuring of a phonological change to a grammatical change is quite a different matter. We feel that such restructuring as we have found would be more likely caused by creolization than by natural internal language change.

- Croneberg, C. (1965) The linguistic community. In W. Stokoe, D. Casterline & C. Croneberg, *A dictionary of American Sign Language*. Washington, D.C.: Gallaudet College Press.
- Fasold, R. (1975). The Bailey wave model. In R. Fasold & R. Shuy (eds), *Analyzing variation in language*. Washington, D.C.: Georgetown University Press.
- Fasold, R. (1976). One hundred years from syntax to phonology. In *Diachronic Syntax*. Chicago: Chicago Linguistic Society.
- Frake, C. (1971) Lexical origins and semantic structure in Philippine Creole Spanish. In D. Hymes (1971), 223-242.
- Frishberg, N. (1975) Arbitrariness and iconicity: Historical change in American Sign Language. *Lg* 51 (3). 696-719.
- Gej'man, I. F. (1957). *The manual alphabet and the signs of the deaf and dumb*. Moscow: Vsesojuznoe Kooperativnoe Izdatel'stvo.
- Gudinschinsky, S. (1964). The ABCs of lexicostatistics (glottochronology). In D. Hymes (ed.), *Language in Culture and Society*. New York: Harper and Row. 612-23.
- Hall, R. (1959) Neo-Melanesian and glottochronology. *IJAL* 25. 265-7.
- Hotchkiss, J. B. (1913). *Memories of Old Hartford*. National Association of the Deaf film. Gallaudet College Library, Washington, D.C.
- Hymes, D. (1971). *Pidginization and creolization of languages*. New York: Cambridge University Press.
- Labov, W. (1972). A modified model for the description of language acquisition in a deaf child. M.A. thesis, California State University, Northridge.
- Siple, P. (1973). Constraints for sign language from visual perception data. Working paper, Salk Institute for Biological Studies, La Jolla, California.
- Southworth, F. (1971). Detecting prior creolization: An analysis of the historical origins of Marathi. In D. Hymes (ed.) *Pidginization and creolization of languages*. New York: Cambridge University Press. 255-74.
- Stokoe, W. (1960). Sign language structure: an outline of the visual communication system of the American deaf. *Studies in Linguistics*, Occasional Paper 8.
- Woodward, J. (1973). A report on Montana-Washington implicational research. *Sign Language Studies* 4. 77-101.
- (1974). Implicational variation in American Sign Language: negative incorporation. *Sign Language Studies* 5. 20-30.
- (1976a). Signs of change: historical variation in American Sign Language. *Sign Language Studies* 10. 81-94.
- (1976b). Historical bases of American Sign Language. A paper presented at the Conference on Sign Language and Neurolinguistics, Rochester, New York, September 1976. Forthcoming in P. Siple (ed.), *Understanding language through sign language research*. New York: Academic Press.
- Woodward, J. & DeSantis, S. (1975). Two to one it happens. A paper presented at the 50th annual meeting of the Linguistic Society of America, San Francisco, December, 1975. Forthcoming in *Sign Language Studies*.
- Woodward, J. & Erting, C. (1975). Synchronic variation and historical change in American Sign Language. *Language Sciences* 37. 9-12.