

## Sign language in India: regional variation within the deaf population

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*ABSTRACT. Sign Language is used by over 1,000,000 deaf adults and by about 500,000 deaf children in India. This paper attempts to describe the structure of Indian Sign Language, which is not related to European sign languages. Theoretically such a description will help contribute to an understanding of universal and unique characteristics of sign language; it may also provide new perspectives on the nature of language in society. This theoretical information has applied potential for the deaf in India and also elsewhere, particularly for their education. (Ed.)*

Sign language is an integral part of deaf communities in India. It is estimated that Indian Sign Language is used by over 1,000,000 deaf adults and by approximately 500,000 deaf children, less than 5% of whom attend special schools for deaf. Yet, despite the unquestioned existence of Indian sign varieties, very little is known about their structure or use. In contrast to some Western countries, sign language has not been used in education of deaf students in India and in most cases has been actively suppressed by educators of the deaf out of ignorance about the linguistic status of Indian Sign Language and lack of knowledge of the language and how it is used.

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Serious attempts to study India's sign languages have never before been attempted and in view of the size of the language community are certainly long overdue. The program of research which we will discuss below will have both theoretical and applied implications. Theoretically, the study of Indian Sign Languages will enhance the understanding of universal and unique characteristics of sign language. India has also often been studied because of the complex interaction of great linguistic and social variation (Burlings 1970). The interaction of deaf individuals who form a minority group, superimposed on the majority culture, could also provide important new perspectives on the nature of language in society. Further this theoretical information can be used to explore the educational potential of sign language in determining the most effective mode of classroom instruction for deaf students.

As a first step toward this goal a questionnaire was sent to the principals of 117 schools for the deaf in India. The findings from these responses suggested that there was a great interest in implementing a study of Indian Sign Languages. The respondents also showed a positive attitude towards sign language and its role in the education of deaf.

Encouraged by this initial study and with help from the Gallaudet College Research Department and the All India Federation for the Deaf, we traveled to India last summer to collect data for initial research. The present paper attempts to sum up our findings.

We would like to describe now our initial research work on Indian Sign Language and then discuss some of the implications of this work for the deaf community in India and in other countries which have similarly disregarded the linguistic communities of their deaf citizens.

#### DATA AND CONSULTANTS

Consultants for the data for this study were chosen first according to their availability and further according to sociolinguistic background factors that we felt might influence signing. All consultants were born deaf, attended schools for the deaf for part of their lives, and used sign language as their preferred form of communication. Consultants were selected from four different regions: Delhi, Bangalore, Calcutta, and Bombay, and are equally divided between male and female. Each of these cities represents a different geographic, cultural and linguistic region of India.

We gathered data on lexical and formational variation of signs and on some basic syntactic structures. Data were gathered on 8mm film from formal elicitation and free conversation. Sixteen consultants were used for the syntactic portion of the study: two males and two females from each of the four cities. Thirteen consultants were used for the study on lexical and formational variation: two males and two females from Delhi and Calcutta; two males and one female from Bombay and one male and one female from Bangalore.

Although our data are preliminary, we have interesting results in both

lexical and syntactic areas. The formational part of the study looks very promising, but the data are not sufficient for complete reporting at this state of our investigation.

#### LEXICAL DESCRIPTION

*Lexical and formational similarity in basic sign:* One of the myths about sign language is that it is universal. As Battison and Jordan (1976) point out: the belief in the universality of sign language is

directly evident in the things that people write and say when they discuss sign language, and indirectly in the manner of their discussions . . . "Bertheir, another 19th century writer, who was deaf himself, made a statement typical of his time: 'For centuries scholars from every country have sought after a universal language, and failed. Well, it exists all around, it is sign language, ' (1854:5).

Battison and Jordan (1976) also point out some interesting examples of American attitudes:

Some signers in America tend to think of all European sign languages as being vaguely the same entity and are often surprised at the complexity and differences among European sign languages. . . . However, European youngsters who had seen many foreign deaf people come and go, had a clear idea of the separation of different sign languages; while the older American college students did not.

Our initial goal then was to obtain empirical evidence to see if Indian Sign Language was related to any European Sign Languages. We thus collected signs from the Swadesh word list, modified for sign language research (see Woodward 1977), for comparison with American Sign Language, the most researched sign language in the French Sign Language Group (Woodward 1978).

As we expected, Indian Sign Language is not related to American Sign Language; nor, from the comparable evidence we have, to any of the European Sign Languages. With a list of 80 words we found no sign that could really be considered cognate with American Sign Language.

Secondly, we wished to discover to what extent Indian Sign Language was a single entity throughout India. Our data also revealed that there is only one Indian Sign Language. Our comparison of all signs collected showed a very uniform pattern for cognates. Table 1 shows the results.

TABLE 1: *Cognate comparison among cities*

	Delhi	Bangalore	Calcutta	Bombay
Delhi	96%			
Bangalore	72%	95%		
Calcutta	79%	79%	99%	
Bombay	86%	80%	84%	91%

The rate of cognates within cities is very high, over 90% for all cities. There are around 95% cognates for Bangalore and Delhi, while Calcutta has almost all sign cognates (99%). Bombay seems to have more internal variation than the other cities, since it has the lowest rate of cognates (91%). However, perhaps because of this variation, Bombay signs have the most cognates across cities, followed by Calcutta, Delhi, and Bangalore.

The average percentage of cognates across cities is: Bombay (83%), Calcutta (81%), Delhi (79%), and Bangalore (77%). While these percentages do indicate variation in basic signs, it seems reasonable from the data to conclude that Indian Sign Varieties in these four cities are one language.

In addition to the variation because of non-cognate signs, we also observed what appears to be systematic formational variation of signs. Formational variation in this case refers to hand positions used to produce specific signs. This variation does not impede communication. Table 2 shows the rate of variation within and among cities.

TABLE 2: *Percent of signs that vary formationally*

	<i>Delhi</i>	<i>Bangalore</i>	<i>Calcutta</i>	<i>Bombay</i>
<i>Delhi</i>	20%			
<i>Bangalore</i>	33%	17%		
<i>Calcutta</i>	29%	33%	3%	
<i>Bombay</i>	35%	29%	19%	34%

Table 2 shows basically the same pattern within cities that we saw in Table 1. Bombay has the highest rate of variation (34%) followed by almost identical percentages of variation in Delhi and Bangalore (20% and 17% respectively), while Calcutta has an extremely low rate of variation (3%). Across cities, Calcutta and Bombay show the most similarity to signs from other cities (27% and 28% respectively) with Delhi and Bangalore showing slightly less similarity at 32%.

#### SYNTACTIC DESCRIPTION

Our investigation of the syntax of Indian Sign Language has goals similar to the investigation of formational aspects of individual word/signs. In addition, we were interested in the types of grammatical markers used in Indian Sign Language for comparison purposes with sign languages from the French Sign Language Group. And, finally, we wanted to note similarities and differences between the sign language used in each city and the dominant spoken language with which our deaf Indian consultants had had most contact.

The materials consisted of pictures representing eight grammatical relations as follows:

- 1 Subject-Verb (e.g., The boy cried)
- 2 Subject-Verb-Objective (e.g., The woman looked at the man)
- 3 Subject-Verb-Objective-Indirect Object (e.g., The man showed the woman the shoes)

- 4 Pronominalization (e.g., The woman chased the man, the woman caught the man (him))
- 5 Adjectival Modification
  - Adjective-Noun (e.g., The sad boy, the blue house)
  - Adjective-Noun-Verb (e.g., The skinny boy ran, the red house burned)
  - Noun-Verb-Adjective-Noun (e.g., The car pulled the big truck)
  - Adjective-Noun-Verb-Adjective-Noun (e.g., The old man kicked the red ball)
- 6 Negative (e.g., The girl is not sleeping)
- 7 Tense (e.g., The man will buy the shoes, the man is buying the shoes, the man bought the shoes)
- 8 Yes-No Question Formation (e.g., Did the monkey jump over the banana?)

The syntax materials consisted of 123 target sentences representing the eight grammatical categories. For each target sentence there was a matching picture and three foils. With each pair of consultants, one would be the sender and the other the receiver. The sender and receiver each had a set of pictures which only he/she could see. The sender would represent each picture in sign language and the receiver would point to what was thought to be the corresponding picture in the receiver's array of four pictures. The sender was filmed during the whole procedure which lasted about twenty minutes.

The results of the referential communication task were felt to be representative of the sign language as it is used naturally by our consultants. The results were as follows:

- (1) In every instance Subject-Verb relations were expressed Subject-Verb sign order. No other grammatical marking was evident.
- (2) Subject-Verb-Object relations were expressed using sign order as well as a variety of grammatical operations observed in the French Sign Language Group. As in American Sign Language, (Kegl 1977), the verb in Indian Sign Language can be highly inflected to designate subject, object and other relations. This may be done by the signer's body orientation (including torso, shoulders, head, face or eye gaze), reference to "self" as either "actor" or "patient," and incorporation of directionality or handshape modification into the verb to indicate subject or object.

Table 3 illustrates the degree of consistency between the subject pairs in each city in expression of subject-verb-object relations. The numbers one through six in the left column of Table 3 represent sentence pairs (e.g., No. 6 THE GIRL PUSHED THE BOY, THE BOY PUSHED THE GIRL). In addition to the six possible sign order permutations of these three term sentences, the more important grammatical features of directionality and

handshape incorporation further increased the options for expressing the relations in the target pictures. Nevertheless, Table 3 illustrates significant consistency between subject pairs with regard to sign order.

TABLE 3: Consistency between subjects in each city in expression of subject-verb-object relations (\*same strategy used by subject pairs in each city)

	Delhi	Bangalore	Calcutta	Bombay
1	*	*	*	*
2	*	*	*	*
3	*		*	*
4	*		*	*
5			*	*
6		*		*

While subject almost always preceded object and verb was in final position in 95% of the sentences, the incorporation of directionality in the verb to express subject and object was also an important and frequently observed grammatical process.

(3) Expression of Subject-Verb-Object-Indirect Object relations further emphasized the role of incorporation in Indian Sign Language. While sign order again indicated subject in the sentence initial position and verb in sentence final position, there was considerable variation in sign order beyond this due to the central role of grammatical incorporation or agreement in the verb.

TABLE 4: Expression of subject, verb, object and indirect object

Delhi	S-O-IO-V (Incorporation of O and IO in V)
Bangalore	S-IO-O-V (Incorporation of O in V)
Calcutta	S-IO-O-V
	IO-S-O-V (Incorporation of O and IO in V)
Bombay	S-IO-O-V
	IO-S-O-V (Incorporation of O in V)

(4) Pronominal forms are used once some context has been established and it is possible to locate the pronoun referent. In contrast to American Sign Language, no specific handshapes (classifiers) were observed as pronoun forms in Indian Sign Language. Instead, effective use of space eliminated the need for specific handshapes in pronominal reference. In the following sentences, (THE WOMAN BOUGHT THE BANANAS, THE MAN GAVE THE WOMAN THE BANANAS), each of the nouns is placed at a specific point in space, so that the GIVE sentence only requires the give motion based on the locations of the three nouns.

(5) Adjectival modification provided the most striking example of a consistent Indian Sign Language grammatical process observed in each of the four cities and yet which does not bear a close relation with the indigenous spoken languages,

Table 5 illustrates that adjectives are always placed after nouns they modify with one exception. Color adjectives, for reasons which are still not clear to us, tend to be placed *before* nouns particularly when modifying object nouns. The consistent pattern we observed has encouraged us to pursue this interesting property of Indian Sign Language.

TABLE 5: *Adjectival modification in Indian Sign Language (expressed in percentages)*

Context	Non-color		Color	
	Before N	After N	Before N	After N
<i>N+Adj</i>	0	100	6	94
<i>N+Adj+V</i>	0	100	31	69
<i>N+Adj+V+N+Adj</i>	2	98	75	25
<i>N+V+N+Adj</i>	10	90	100	0
<i>Other</i>	11	89	100	0
<i>Averaged Totals</i>	3	97	48	52

- (6) Negation of Indian Sign Language was expressed with a single negative sign attached to end of the sentence after the verb. This rule was applied consistently in Bangalore, Calcutta and Bombay. In Delhi, the negative element was placed before the verb in 5 out of 22 instances.
- (7) The study of tense marking revealed a single past marker which occurs in sentence final position in Indian Sign Language. It also appears that in Indian Sign Language as in American Sign Language, a time frame is set by use of the past marker and no further reference is made until a tense shift is made.
- (8) Question formation was elicited by showing an action which has several consequences (e.g., a picture of THE GIRL THROWS THE BALL, and then a picture of THE BALL GOES OVER THE BOY'S HEAD, THE BOY CATCHES THE BALL, THE BALL HITS THE BOY'S HEAD). In attempting to question which outcome would take place the signer would produce the equivalent of a declarative sentence followed by tilting forward or sideward of the head, raised eyebrows or holding the hands in the position of the last sign.

It is clear that Indian Sign Language has a definite set of grammatical rules for expressing sentence relations. Moreover, these rules are relatively constant in the four deaf communities we visited. It is also important to note that the regular nature of Indian Sign Language syntax does not parallel the syntax of spoken languages with which the various deaf communities have contact, although naturally there may be some influence of those language contacts.

#### SUMMARY AND IMPLICATIONS

The research in this paper has shown (1) that varieties of Indian signing are not related to European Sign Languages, (2) that varieties of Indian signing constitute one language, (3) that there is systemic variation in and between regions in India and (4) that the amount of differences in signing

should allow communication among cities without any major problems in language standardization and planning that are faced by the oral language communities. In terms of the syntactic structure of Indian Sign Language, there is clear evidence that an underlying rule structure exists which shares some borrowed features from contact with Indian spoken languages. Moreover, the SOV ordering of Indian Sign Language corresponds to a putative universal for constraints in basic sign order (You 1976).

Clearly, the Indian Sign Language used by over one million people in the deaf community is just as much a linguistic system as the spoken language used by the hearing communities. As a result of this first investigation we have been very encouraged to continue the study of Indian Sign Language, a sign language used by possibly more deaf people than any other sign language in the world's deaf community.

#### T O W A R D T H E F U T U R E

As we pointed out in the introduction to this paper, we consider our study very preliminary. We plan to continue collecting signs for a dictionary of Indian Sign Language, with regional variations clearly noted. Such a dictionary should aid professionals associated with the deaf community in India. For example we feel it could be extremely useful for the newly founded educational-legal-medical interpreter service center serving the deaf community in Bombay.

In addition to the dictionary, we also plan on continuing formational and syntactic analyses of Indian Sign Language. From a theoretical point of view, such information will be particularly useful, since the majority of research in sign languages has concentrated on the French Sign Language Group. Since Indian Sign Language does not belong to this group, any findings will be of further use in determining universal and unique constraints in sign languages.

From an applied point of view, we hope that our initial and subsequent research will help alleviate some of the basic misunderstandings about Indian Sign Language and the resultant discrimination against sign language and deaf people in India. Furthermore, we hope that our studies will also make a contribution to field research methodology for similar projects to aid deaf communities in other developing nations.

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