VOLUME 55 - SUMMER 1987

BILINGUALISM & DEAFNESS: AN ANNOTATED BIBLIOGRAPHY

Ceil Lucas, with Anthony Aramburo, Brian Cerney, Lynn Jacobowitz, Patti Levine, Cynthia Patschke, Brian Riley, and Julie Ward

Introductory.

This bibliography is the direct result of frustration experienced as I prepared a list of readings for a graduate seminar on bilingualism I taught in the fall of 1986, in the Department of Linguistics and Interpreting at Gallaudet University. Many studies in the field of deafness deal directly or indirectly with different aspects of bilingualism, but no bibliography unites all the various studies with any semblance of order. Although the frustration was originally mine, I shared it with my students, named above, inducing them to do much of the work. Our goal was a reference tool for students and researchers interested in bilingualism and deafness -- a point of departure, a way to get a handle on a fairly diverse area of study.

My job was to edit, supplement, and organize the final project, which is divided into six major sections:

1. Sociolinguistic Aspects of Bilingualism and Deafness

2. Linguistic Aspects of Bilingualism and Deafness

3. Psycholinguistic Aspects of Bilingualism and Deafness

4. Language Acquisition

5. Language Policy and Bilingual Education

6. Language Attitudes.

A distinction is drawn (Secs. 4 & 5) between descriptive studies in the area of language acquisition and studies in the area of language policy and bilingual education: some of the latter may have language acquisition components, but they focus mainly on policy development and implementation.

I am certain that the bibliography is not exhaustive, and indeed, some of you who regularly read Sign Language Studies may find cause to exclaim over glaring omissions. It is our hope that you will simply make us aware of any such omissions so that we can amend the bibliography. No page references are given; when the document is smaller than book length it can easily be found in the volume noted.

1. Sociolinguistic Aspects of Bilingualism & Deafness.

Bernstein, M. et al. 1985. Bimodal or bilingual communication? Sign Language Studies 47.

Focuses on the investigation of variation in manual communication. Deaf and hearing consultants fluent in American Sign Language and with good command of English provide a closer look at mode changing among signers, as opposed to discussion of variation as a pidgin on a diglossic continuum. Caccamise, F. & D. Hicks, eds. 1978. ASL in a Bilingual, Bicultural Context (Proceedings of 2nd NSSLRT). Silver Spring, MD: National Association of the Deaf.

A comprehensive volume covering a wide range of topics, including linguistic descriptions of sign language, the acquisition of sign language, sign language instruction, and sign language use.

Carmel, S. 1980. Aspects of sociolinguistic segmentation in American urban deaf

communities. MA thesis. American University, Washington, DC.

Describes observations in three deaf social clubs in a large midwestern city to study boundary maintenance mechanisms and related sociocultural and linguistic variables. Finds that differing socioeconomic status, educational background, and sign language styles combine to establish and maintain social cleavages within a deaf community.

Delgado, G. ed. 1984. The Hispanic Deaf: Issues & Challenges for Bimodal Special Education. Washington, DC: Gallaudet University Press.

A comprehensive volume covering Hispanic deaf population, language dynamics, language choices, assessment, education programming, and teacher preparation.

Kannapell, B. 1980. Personal awareness & advocacy in the Deaf community. In Sign Language & the Deaf Community, Baker & Battison eds. Silver Spring, MD: National Association of the Deaf.

Describes the author's personal experience of discovering her identity as a deaf person through understanding of her own language, American Sign Language. She explains how the study of language in its social context led her to support bilingual education, and discusses English and American Sign Language usage in relation to function, using Weinreich's terms "coordinate" and "compound" bilingual in application to the deaf community.

Kannapell, B. 1985. Language choice reflects identity choice: A sociolinguistic study of deaf college students. Ph.D. dissertation. Georgetown University.

Describes the demographic background of a representative sample of students and the linguistic/ communicative diversity underlying their attitudes toward American Sign Language and English and toward users of these. Shows the importance of developing a sociolinguistic profile of deaf students at every level: most deaf people are bilingual in varying degrees, though possibly some deaf people are monolingual in either American Sign

Language or English.

Lane, H. 1980. Some thoughts on language bigotry. An address delivered on Professional Day at Gallaudet College. MS Northeastern University.

Discusses negative attitudes and feelings toward American Sign Language coming from hearing society's resistance to the language of the deaf. Upward mobility for the deaf has been checked by social rejection of their language; e.g. in proportion of deaf persons in manual and unskilled jobs, the non-recognition of sign language as a foreign language, and prejudicial attitudes toward the language.

Lane, H. & F. Grosjean, eds. 1980. Recent Perspectives on American Sign Language. Hillsdale, NJ: L. Erlbaum Associates.

Contains chapters on the linguistic, psycholinguistic, developmental, neurolinguistic, sociolinguistic, and historic perspectives on American Sign Language. Provides a general overview of the field of deafness. Introduction addresses specific misconceptions about deafness.

Lucas, C., ed. (i.p.) The Sociolinguistics of the Deaf Community. New York: Academic Press.

A collection of essays on a variety of topics relevant to bilingualism and deafness, including language contact, policy, attitudes, and interpreting.

Markowicz, H. 1980. Some sociolinguistic considerations of American Sign Language. In Sign Language & the Deaf Community, Baker & Battison eds. Silver Spring, MD: National Association of the Deaf.

Raises key sociolinguistic issues in the Deaf community, including the acquisition of sign language by congenitally deaf persons, the use of sign language as a medium of instruction,

and relations to a hearing society using an oral method of communication with the deaf.

Markowicz, H. & J. Woodward. 1978. Language & the maintenance of ethnic boundaries in the deaf community, Communication & Cognition 11:1.

Suggests that language ability both defines and reflects an individual's status in the Deaf community. Deaf people who have learned signs late in life may be excluded from activity in the community. When it occurs, communication with such outsiders uses a middle of the road system (American Sign Language and English being the extremes).

Meadow, K. 1972. Sociolinguistics, sign language & the deaf subculture. In Psycholinguistics & Total Communication, O'Rourke ed. Silver Spring, MD: National Association of the Deaf.

Presents background material on the deaf community and on sociolinguistics as a field of study and explores codes and code-switching in sign language, the process of socialization to the deaf linguistic community, the history of sign language maintenance, promulgation, and subjugation as compared to other linguistic communities, and the etiquette and ecology of signed conversations.

Padden, C. & H. Markowicz. 1976. Cultural conflicts between hearing & deaf communities. In Proceedings of the Seventh World Congress of the World Federation of the Deaf. Silver Spring, MD: National Association of the Deaf.

Demonstrates that deafness itself does not automatically ensure entry into the deaf community.

For a non-member to enter the community appropriate language skills and behaviors are necessary.

Schein. J. 1968. The Deaf Community. Washington, DC: Gallaudet College Press.

Finds that the majority of hearing-impaired adults in the Washington, DC area are able to communicate both manually and orally. The communication chosen is situation-dependent. (See Section 6)

Washabaugh, W. 1981. Sign language in its social context, Annual Review of Anthropology 10.

Investigates sign language acquisition and sign language variation using sociolinguistic methods. While the sign languages and spoken languages discussed in this study appear to be alike, deaf and hearing communities are different these differences lie in the deaf-deaf and deaf-hearing social relations and the use of respective language's styles for communication.

Wilbur, R. 1979. Sociolinguistic aspects of American Sign Language usage. In American Sign Language & Sign Systems, Wilbur ed. Baltimore: University Park Press.

Various sociolinguistic aspects of American Sign Language are discussed: history, variations in phonology, morphology & syntax, Pidgin Sign English, and how language relates to the deaf community (authors of relevant studies are cited).

Woodward, J. 1980. Sociolinguistic research on American Sign Language: An historical perspective. In Sign Language & the Deaf Community, Baker & Battison eds. Silver Spring, MD: National Association of the Deaf.

Discusses sociolinguistic variation in the U.S. Deaf community according to race, sex, region & social context. Diglossic and bilingual situations are identified and a diglossic continuum described between American Sign Language and English (includes an overview of studies done on this topic).

Woodward, J. 1982. How You Gonna Get to Heaven if You can't Talk with Jesus? Silver Spring, MD: TJ Publishers.

A collection of articles on sociolinguistic issues in the deaf community; topics include the maintenance of ethnic boundaries, the educational establishment and its relationship with the deaf community, implementation of bilingual education, attitudes about deaf people and sign language, and the depathologizing of deafness.

2. Linguistic Aspects of Bilingualism & Deafness.

Aramburo, A. 1986. Code switching in the Deaf community with implications of variation among Black Deaf individuals. Unpublished MS. Gallaudet University.

Provides an overview of signers' code switching, discusses switching between American Sign Language and English, and focuses on variation and code switching in Black signers.

Battison, R. 1978. Lexical Borrowing in American Sign Language. Silver Spring, MD: Linstok Press.

Reviews sign structure, phonological and morphological processes, and proposes constraints that regulate sign formation. Touches on ASL-English contact. Gives examples of how words are borrowed from English into American Sign Language, including phonological and morphological restructuring and semantic changes.

Charrow, V. 1976. A linguist's view of manual English. In Proceedings of the 7th World Congress of the WFD, Crammatte & Crammatte eds. Silver Spring, MD: NAD.

Cites problems with signed English systems (SEE I, SEE II & LOVE): slow, frustrating mode that loses functions in natural conversation signs created when American Sign Language has a sign already (despite claims by the system's creators that there is none); some created signs violate constraints of American Sign Language thus working against the natural phonological processes that act on a given language.

Cokely, D. 1983. When is a pidgin not a pidgin? An alternate analysis of the ASL-English

contact situation, Sign Language Studies 38.

Suggests that the contact situation of signers and speakers who use signs does not result in a pidgin because the conditions for pidgin development are absent. For deaf and hearing users of signs, the interplay of "foreigner talk," judgments of proficiency, and attempts to master the target language (learners' grammar) may account for the ASL-English variation.

Cokely, D. & R. Gawlik. 1973. Options: A position paper on the relationship between manual English and Sign, The Deaf American, May 1973.

Compares SEE I, SEE II, & LOVE with American Sign Language. Criticizes the systems for signing English, especially the "one word, one sign" principle and the false claim that they use signs of American Sign Language; suggests some alternatives to the current systems; and suggests that both American Sign Language and English should be offered in the education of deaf children.

Lee, D. 1982. Are there really signs of diglossia? Re-examining the situation, Sign Language Studies 35.

Looks back at Stokoe's 1969 analysis of diglossia in the American deaf community, using Ferguson's (1959) nine criteria of diglossia, and suggests that the variation found is better described as code switching and style shifting than as diglossia.

Reilly, J. & M. McIntire. 1980. American Sign Language & Pidgin Sign English: What's the difference? Sign Language Studies 27.

Discusses the differences between ASL and PSE and suggests a simultaneity continuum within the English/ASL continuum, with a gradation from structures that are more obvious to the language learner (classifiers and directional verbs) to structures that are more subtle (sustained signs and facial and other nonmanual behaviors).

Stokoe, W. 1970. Sign language diglossia, Studies in Linguistics 21.

Suggests that diglossia (Ferguson 1959, 1964) in the context of the education of the deaf is a stable "special situation" that has educational implications for teaching signs. English the "H" language is formally taught and has more technical terms. ASL the "L" language is less prestigious, simpler grammatically, and used for informal functions. Speakers of L may deny that L exists or that they use it. (A slightly different version of the paper appears in Semantics & Human Sign Languages by Stokoe. 1972. The Hague: Mouton.)

Woodward, J. 1973. Some characteristics of Pidgin Sign English, Sign Language Studies 3.

Focuses on classifying characteristics of PSE varieties; presents the notion of a "deaf diglossic continuum" between ASL and (signed) Standard English and the possibility of locating a language variety on the continuum. PSE characteristics described include articles, plurality, and aspects.

Woodward, J. & H. Markowicz. 1980 (1975). Some handy new ideas on pidgins & creoles. In Sign & Culture, Stokoe ed. Silver Spring, MD: Linstok Press (Paper presented at International Conference on Pidgin & Creole Languages, Honolulu).

Gives an overview of the language situation in the deaf community, discusses the sociolinguistic reasons for the existence of PSE, suggests the linguistic characteristics of PSE, and discusses the relationship of PSE to a theory of pidgin and creole languages.

3. Psycholinguistic Aspects of Bilingualism & Deafness

Corina, D. & J. Vaid. 1986. Tapping into bilingualism: Cerebral lateralization for English and American Sign Language. Paper at Conference on Theoretical Issues in Sign Language Research, Rochester, NY, June.

Lateralization in bimodal hearing ASL-English bilinguals indicates that left hemisphere lateralization for sign language may be the result of some inherent characteristics and not a

compensatory process after auditory deprivation.

Hauptman, A. 1981. Bilingualism & cognition: Implications for the deaf or hearing impaired student. In 1980's Schools: Portals to Century XXI Selected Papers, Propp ed. CAID, Inc.

Reviews the relationship between bilingualism and cognition in the context of the information processing of Schroder et al. (1967) and the cognitive differentiation theory of Witkin (1974). Discusses cognitive processes involved in the acquisition of native and second language, the relationship between cognitive style development and bilingualism, the role of bilingualism in the development of attitudes and personality structure, and the implications of the theories for the deaf or hearing-impaired learner.

Herbert, R. 1982. Cerebral asymmetry in bilinguals & the deaf: Perspectives on a common pattern, Journal of Multilingual & Multicultural Development 3.

Considers structural aspects of sign language as well as sociolinguistic aspects of the deaf community needed to explain lateralization patterns in native signers. The frequency of deaf bilingualism is discussed.

Kettrick C. 1986. Cerebral lateralization for American Sign Language & English in deaf & hearing native & non-native signers. Paper at Conference, Theoretical Issues in Sign Language, Rochester, June.

Examines the onset of bilingualism among bilinguals using American Sign Language and English and calls for an objective measure of fluency in the former for both early and late bilinguals.

Morarin, J. & R. Bruning. 1984. A contextualist perspective of language processing by prelingually deaf students. In International Symposium on Cognition, Education & Deafness, Martin ed., vols. I & II. Washington, DC: Gallaudet University Press.

Discusses a test of 30 prelingually deaf high school students on the processing of passages

in signed ASL, signed English, print ASL, and print English. The results indicate that American Sign Language can serve as a primary means for the development of fluency in English.

Panou, L. & D. Sewell. 1981. Cerebral lateralization in the deaf: A bilingual pattern? Journal of Multilingual & Multicultural Development 2.

Reveals through review of the literature that past conclusions have been reached by faulty methodology, which compares language lateralization in the deaf with that in hearing monolinguals.

Poizner, H., R. Battison & H. Lane. 1979. Cerebral asymmetry of American Sign Language: The effects of moving stimuli, Brain & Language 7.

Describes research in which congenitally deaf native users of American Sign language were presented moving signs, static representations of signs, and English words. Hearing English speakers were also asked to identify the English words. The results confirm previous findings that both deaf and hearing subjects show a left-hemisphere advantage to signs presented statically. The deaf subjects showed no lateral asymmetry for the moving signs.

Vernon, McKay. 1967. Relationship of language to the thinking process, Archives of Genetic Psychiatry 5.

Suggests that there appears to be no correlation between ability in a spoken language and cognitive processes or concept formation. Internal thought need not be conveyed by a spoken language.

Vernon, McKay. 1972. Language development's relationship to cognition, affectivity & intelligence, The Canadian Psychologist 13.4.

Discusses the verbal and nonverbal communicative skills of congenitally deaf people in a variety of communication environments and suggests that IQ tests are an inaccurate means

of determining the intelligence of deaf people because of their cultural deprivation .

4. Language Acquisition / Bilingualism & Deafness

Brasel, K. & S. Quigley. 1977. The influence of early language & communication environments on the development of language in deaf children. Manuscript. University of Illinois Institute for Research on Exceptional Children.

Concludes that parental use of manual communication allows the deaf child to acquire aspects of the parents' competence in the language. Manual English appears to provide much better competence in English than do oral methods.

Erting, C. 1980. Sign language & communication between adults & children. In Sign Language & the Deaf Community, Baker & Battison eds. Silver Spring, M~: National Association of the Deaf.

Reviews some of the research on how deaf children learn to communicate from adults and other children, how communication is influenced by the environment in schools, and the role of "native signers" in a language-learning situation. The hearing teacher's and the deaf assistant's code switching in the classroom is given special consideration, and it is observed that the greatest number of total turns was by the group of children whose native language is American Sign Language.

Erting, C. 1982. Deafness, communication & social identity: An anthropological analysis of interaction among parents, teachers & deaf children in a preschool. Ph.D. dissertation in Anthropology. American University, Washington, DC.

Shows how schools for deaf children are complex linguistic and social environments in which interaction among parents, teachers, and children are shaped by tensions between two competing social identities, "Deaf" and "hearing." Data suggest how an individual's choice of language and expressed language attitudes serve to indicate, construct, and maintain

Deaf, or hearing, social identity during social interaction with others.

Griffith, P. 1985. Mode-switching & mode-finding in a hearing child of deaf parents, Sign Language Studies 48.

Case history of child between 17th and 23rd month, using diary method. Different linguistic devices used by the child when communicating with familiar and unfamiliar individuals and in small groups are described to demonstrate mode switching.

Hatfield, N. 1983. An investigation of bilingualism in two signed languages. Doctoral dissertation, University of Rochester.

Variables traditionally associated with bilingual proficiency (e.g. age of acquisition and context for language learning) were predictive of sign language performance. Age of acquisition was the single best predictor of ASL skill, while type of schools attended was the best predictor of skill in manually encoded English (MCE). Data suggest that deaf children exposed to both ASL and MCE from early age become balanced bilinguals, while those who learn to sign later are more apt to be dominant in one or the other, depending on language-learning contact and other factors.

Johnson, R. & C. Erting. 1984. Linguistic socialization in the context of emergent & deaf ethnicity. Working Papers in Anthropology. NY: Wenner-Gren Foundation.

Develops the theoretical claim that Deafness is an ethnic phenomenon -- not primarily a disability but fundamentally a way of behaving that emerges from interaction both among Deaf people and between Deaf people and hearing people. Describes communicative interaction in a preschool classroom for deaf children, where manifestations of emergent Deaf ethnicity are isolated and some mechanics of socialization into patterns of ethnically salient symbolic language use are demonstrated.

Jones, M. & S. Quigley. 1979. The acquisition of question formation in spoken English and American Sign Language by two hearing children of deaf parents, Journal of Speech &

Two young hearing children of deaf parents learn question formation in a linguistic environment that includes varying amounts of exposure and interaction with manual speech and the nonstandard speech of their parents.

Livingston, S. 1983. Levels of development in the language of deaf children: ASL grammatical processes, signed English structures & semantic features, Sign Language Studies 40.

A 90+ page abridgment of below.

Livingston, S. 1981. The acquisition & development of sign language in deaf children of hearing parents. Ph.D. dissertation. New York University.

To hypothesize stages in acquisition of American Sign Language, analyzes the sign language of six profoundly deaf children (6 to 16 years) of parents who knew no sign language. Development in signed English (used exclusively in the school) was also examined. Comparison of the structures in the children's language revealed that they express most of their intentions in ASL more than in signed English, using ASL grammatical processes at initial stages of development. At each stage more complicated ideas were processed in ASL; however, at later stages, hierarchically arranged constituent groups could be expressed in either ASL or signed English. Five levels of complexity in ASL are suggested.

Maestas y Moores, J. 1980. Early linguistic environments: Interactions of deaf parents with their infants. Sign Language Studies 26.

A brief abridgment and addition (fathers' communicative strategies also included here) to dissertation (below). It should be noted that at the ages of 1 to 6 months the babies' hearing status was not yet determined.

Maestas y Moores, J. 1980. A descriptive study of communication modes and pragmatic functions used by three prelinguistically profoundly deaf mothers with their infants 1-6 months of age in their homes. Ph.D. dissertation. University of Minnesota.

In this study with deaf mothers and their deaf children, the results suggest that profoundly deaf mothers use the same pragmatic functions as hearing mothers in communication with babies but use vocal and manual language systems complementarily.

Mayberry, R. 1976. An assessment of some oral and manual language skills of hearing children of deaf parents. American Annals of the Deaf 121.5.

Compares the vocal, manual & combined language skills of eight first-born normally hearing children between the ages of 3 and 7, whose parents used manual communication. Describes modes of parent-child communication. The children's spoken language performance showed deficits or delays; manual language performance ranged both below and above expectation. No relation found between parental use of either mode and children's language skills, but manual language proficiency appeared inversely related to parental use of spoken language.

Meadow, K., M. Greenberg, C. Erting & H. Carmichael. 1981. Interactions of deaf mothers & deaf preschool children: Comparisons with three other groups of deaf & hearing dyads, American Annals of the Deaf 126.4.

Videotapes of deaf mothers and deaf children, hearing mothers and deaf children (one group oral-only communication, one oral+sign), and hearing mothers and hearing children showed that the oral-only group of hearing mothers and deaf children spent by far the least amount of time interacting. The greatest similarities were found between deaf children with deaf mothers and hearing children with hearing mothers.

Prinz, P. & E. Prinz. 1981. Acquisition of American Sign Language and spoken English by a hearing child of a deaf mother & hearing father: Phase II, early combinatorial patterns. Sign Language Studies 30.

Investigates the transitional stage between the child's use of one-word utterances and combinations of words. Four major aspects of language acquisition were found.

Schlesinger, H. 1978. The acquisition of signed & spoken language. In Deaf Children: Developmental Perspectives, Liben ed. New York: Academic Press.

Examines aspects of language acquisition in deaf children raised by hearing parents who have learned both manual and spoken representation of English; i.e. bimodal English. Suggests that bimodal language acquisition shares many of the known features of spoken language acquisition; i.e. that bimodal perceptual salience affects the order of morpheme acquisition. Notes some special features of bimodalism and bilingualism.

Stewart, D. 1985. Language dominance in deaf students, Sign Language Studies 49.

Discusses bilingual research and its implications for the deaf community in considering bilingual education. In order to measure the decoding process in the dominant language and the non-dominant language, subjects were asked to retell a story presented in English. Although it was hypothesized that they would use their dominant language for retelling, the results showed that regardless of their dominant language, all students preferred to retell English stories in American Sign Language.

Wilbur, R. & M. Jones. 1974. some aspects of the acquisition of American Sign Language & English by 3 hearing children of deaf parents. In Papers from the 10th Regional Meeting of the Chicago Linguistic Society. Chicago.

Describes a longitudinal study and suggests the maintenance of separate language systems (American Sign Language and English) and a hierarchy of sign features.

5. Language Policy & Bilingual Education

Baker, C. 1978. How does "sim-com" fit into a bilingual approach to education? In Proceedings of the 2nd National Symposium on Sign Language research & Teaching,

Caccamise & Hicks eds. Silver Spring, MD: National Association of the Deaf.

Discusses three questions: (1) What is sim-com (simultaneous communication)? (2) Why do schools advocate using sim-com? (3) How well does sim-com work as a method for teaching English? Examines problems encountered when hearing teachers use sim-com with deaf children; e.g. deletion (of English words from signed representation) and differences in rates of signing with and without voice.

Bockmiller, P. 1981. Hearing impaired children: Learning to read a second language, American Annals of the Deaf 126.7.

Compares reading skills of hearing and hearing-impaired children on achievement tests; the latter had poorer scores than the former. Deaf children of deaf parents score higher because of earlier acquisition of American Sign Language. Results used to argue for bilingualism, ASL and English, in education of the deaf.

Brasel, K. 1975. The influence of early language & communication environments on the development of language in deaf children. Ph.D. dissertation. University of Illinois.

Reports on the development of two groups of deaf children with deaf parents and two groups of deaf children with hearing parents respectively identified as Manual English, Average manual, Intensive oral, and Average oral. On every test the two groups with deaf parents were significantly superior to the two with hearing parents. The Manual English group scored highest on each of ten measures and the Average oral group scored lowest.

Caccamise, F. & R. Blaisdell. 1977. Reception of sentences under oral, manual, interpreted & simultaneous conditions, American Annals of the Deaf 122.

Reports on the reception of sentences from the CID (Central Institute for the Deaf) Everyday Sentence List by 298 NTID students under five conditions: sound only, speechreading only, speechreading plus sound, manual communication, and simultaneous communication. Sentences were understood by 27% of the subjects when presented to hearing only; by 34% through speechreading alone; by 64% through a combination of speechreading and sound

and by 89% through simultaneous communication.

Carlisle, C. 1981. The hearing impaired Hispanic child: Sociolinguistic considerations. Unpublished manuscript. Texas Women's University.

Champie, J. 1984. Is total communication enough? The hidden curriculum, American Annals of the Deaf 129.3.

Suggests that the curriculum for education of deaf children is based on values of a majority society. Exclusion of American Sign Language from the curriculum impairs the deaf children's self concept and English skills. Recommends that ASL and Deaf Culture be a major component of every deaf child's curriculum.

Charrow, V. 1973. English as the Second Language of Deaf Students. Technical Report No. 208. Institute for Mathematical Studies in the Social Sciences. Stanford University.

Compares deaf children of deaf and of hearing parents on Tests of English as a Foreign Language.

Results indicate the importance of an early start in language. Deaf children of deaf parents score higher and their early language is American Sign Language. Also indicates that a standard test of English skills of foreign speakers measured the different abilities among deaf children of deaf parents better than deaf children of hearing parents, who presumably are not as likely as deaf children of deaf parents to be learning English as a second language. Recommends that deaf children of hearing parents should learn sign language to improve their second language (English) skills, despite ostensibly having English as first language; and concludes that oralism will produce only negative effects on learning a second language.

Charrow, V. 1974. Deaf English: An investigation of written English competence of deaf adolescents. Ph.D. dissertation. Stanford University.

Compares linguistic competence in three different modes of communication: sign language,

English, gestures. Concludes that the deaf learn standard sign language, that the English learned and used is not standard English but a dialect. Gives a history of deaf education and describes various communication modes used in deaf education.

Charrow, V. & J. Fletcher. 1974. English as the second language of deaf students, Developmental Psychology 10.4.

Demonstrates that on standardized English tests deaf children of deaf parents perform better than deaf children of hearing parents and recommends that deaf students be taught English as a second language to improve their language skills.

Clements, A. & H. Prickett. 1986. American Sign Language in Education of the Deaf, American Annals of the Deaf

Suggests that American Sign language as a natural language of the deaf should be an integral part of total communication programs. Use of ASL and study of Deaf culture increases deaf people's self sufficiency and individuality, which has been lacking for years in education of the deaf. Also suggests that an incorporation of ASL in the educational process for the deaf may result in better mastery of English skills.

Cokely, D. 1978. Program considerations in a bilingual "ASL-English" approach to education. In Proceedings of the 2nd National Symposium on Sign Language Research & Teaching, Caccamise & Hicks eds. Silver Spring, MD: National Association of the Deaf.

Presents the needs for establishing and maintaining bilingual ASL-English language programs in schools for the deaf. Stresses the need for a clearly defined and documented published language policy that will include research data, educational materials on bilingualism and ASL in layman's terms, and open discussion among parents, educators, and administrators, in-service training programs, regular evaluation of policy, teachers, and students' progress, as well as modifications in present hiring practices.

Cokely, D. 1980. Sign language: teaching, interpreting & educational policy. In Sign Language & the Deaf Community, Baker & Battison eds. Silver Spring, MD: National

Association of the Deaf.

Discusses the use of sign language within three professions -- teaching, interpreting, and education -- in terms of the conscious selection of American Sign Language and signed English. Suggests that for the educator the potential of total communication as philosophy hinges on receptive attitudes toward ASL and the Deaf community, and that sign language teaching and interpreting as a profession must begin with the awareness of the complex linguistic situation within the Deaf community.

Carson, H. 1973. Comparing deaf children of oral parents & deaf parents using manual communication with deaf children of hearing parents on academic, social & communicative functioning. Doctoral dissertation. University of Cincinnati.

Reports that ten deaf children of deaf parents at the Clarke School for the Deaf and ten deaf children of deaf parents at the American School for the Deaf were superior to deaf children of hearing parents in both schools, in reading, arithmetic, and speechreading. At the time of the study both schools were strictly oral through the preschool and primary grades.

Coye, T., T. Humphries & B. Martin. 1978. A bilingual, bicultural approach to teaching English, or how 2 hearies and a deafie get together to teach English. In Proceedings of the 2nd National Symposium on Sign Language Research & Teaching, Caccamise & Hicks eds. Silver Spring, MD: National Association of the Deaf.

Discusses the teaching of English to deaf students in a bilingual bicultural context. Main aim is to change students' and teachers' attitudes toward languages and language learning and resolve cultural conflicts between the deaf and hearing. Presents methods and materials for use of American Sign Language to teach English as well as results and reactions of students toward this new approach.

Erting, C. 1978. Language policy & deaf ethnicity in the United States, Sign Language Studies 19.

Discusses American Sign Language as the language to be used to identify members of the

deaf ethnic group, ways that ASL can be used in the process of educating deaf children bilingually, and the impact of deaf teachers in the classroom on the deaf child's learning of ASL. Differences between deaf children of hearing parents and of deaf parents are related to language acquisition. Based on direct observation by the author of a bilingual program (English-ASL; hearing teacher, deaf aide) useful in deciding language policy in the educational setting.

Goldberg, J. & M. Bordman. 1975. The ESL approach to teaching English to hearing-impaired students, American Annals of the Deaf 120.1.

Describes the English Language Program at the tutorial center of Gallaudet College, using ESL (English as a second language) methodology -- as opposed to methods of remedial English; and describes adaptation of the methods and materials to the needs of the students.

Gonzales, J. 1985. Spanish-speaking parents & their deaf children. Manuscript in Linguistics Department, Gallaudet University.

Discusses problems of educating Deaf children of Spanish-speaking parents; suggests that the parents should be taught English not the children taught Spanish, though opposition from zealous supporters of bilingual education is considered. Two proposals are made concerning bilingual education for the deaf, one from Brownsville, the other from Trinity, Texas. In both the goal is to get the parents eventually to work in English with the deaf child.

Grove, C., F. O'Sullivan & M. Rodda. 1979. Communication & language in several deaf adolescents, British Journal of Psychology 70.

Reports on a test of communication skills consisting of 120 messages varying from simple to complex in syntactic and semantic structure. The test was given in their preferred mode of communication to deaf British adults aged 16 to 21. Results show that subjects tested with total communication scored significantly higher than subjects tested orally, in all forms of the messages.

Hatfield, N. et al. 1978. Deaf students' language competencies: A bilingual perspective,

American Annals of the Deaf 123.

Investigates 219 students' understanding of messages presented in American Sign Language and manually coded English. Subjects (at the National Technical Institute for the Deaf) were divided by proficiency in manual communication into low, medium, and high groups. The high group included deaf children of deaf parents who had used manual communication from early childhood; medium, deaf children of hearing parents who were exposed to manual communication in educational programs; the low group had little prior exposure to manual communication. Average mistake scores: high, 1.89 ASL, 2.09 MCE; medium, 2.57 ASL, 2.63 MCE; low, 5.25 ASL, 3.86 MCE.

Hatfield, N. 1982. An investigation of bilingualism in two signed languages: American Sign Language & manually coded English. Ph.D. dissertation. University of Rochester.

Presents measures of bilingualism among six groups of deaf people: (1) self-ratings of expressive and receptive American Sign Language; (2) interviewer's ratings of subjects' receptive and expressive ASL and MCE. Balanced bilinguals scores higher than five other groups in which one or the other language predominated. Proposes that deaf children be exposed to both ASL and MCE at an early age so as to become balanced bilinguals, and that there should be an investigation to show differing skills in ASL and MCE as a carefully considered variable in research on deafness, language development, communication, and related topics.

Higgins, E. 1973. An analysis of the comprehensibility of three communication methods used with hearing impaired students. American Annals of the Deaf 118.

Reports on Gallaudet students' understanding of the Rochester Method (complete fingerspelling), of "colloquial signs," and of signed approximations to English. The understanding of signed approximations to English was found to be significantly higher than that of the other two methods, no significant difference between the other two.

Jensema, C. & R. Trybus. 1978. Communication patterns & educational achievement of

hearing impaired students. Office of Demographic Studies, Gallaudet University.

Presents results of a study of the reported communication patterns of a national sample of 657 hearing-impaired children. Examines the extent to which various modes are used, the relationship between communication patterns and school achievement test scores in vocabulary, reading comprehension, mathematics concepts, and computation.

Kannapell, B. 1974. A new direction in the education of the deaf. The Deaf American 26.

Reviews fundamental concepts about bilingualism and bilingual education (as of 1974) and relates them to the education of deaf people. Considers whether deaf persons ought to be considered bilingual and if so, whether a system of bilingual education ought to be instituted in schools and programs for deaf children.

Kannapell, B. 1978. Linguistic & sociolinguistic perspectives on sign systems for educating deaf children: Toward a bilingual approach. In Proceedings of the 2nd National Symposium on Sign Language Research & Teaching, Caccamise & Hicks eds. Silver Spring, MD: National Association of the Deaf.

Provides an overview of communication methods and instructional methods used in deaf education. Records the total number of classes using each of four modes of communication at different school levels; demonstrates how the four modes have different meanings for words used by deaf people; reveals how deaf people feel toward American Sign Language and English; and demonstrates how bilingual education should be implemented. Notes that research in bilingualism could be important to deaf children and suggests that educators and members of the Deaf community work together to promote a bilingual and bicultural education for deaf children.

Keefe, J. 1982. Cultural reproduction & the hidden curriculum: An investigation into preschool programs for the deaf. Ph.D. dissertation. Boston University, School of Education.

Describes various methods and procedures used to obtain data about ideologies and assumptions expressed in cultural aspects of deaf and hearing people. Keefe encourages

development of bilingualism with biculturalism in curricula and programs for the deaf by retraining teachers of American Sign Language and Deaf culture, hiring qualified deaf professionals in schools, improving attitudes toward child language development, and accepting bilingualism as a formal language instruction mode.

Klopping, H. 1972. Language understanding of deaf students under three auditory-visual conditions, American Annals of the Deaf 117.

Reports on a study of 20 high school students at the Arizona School for the Deaf that compared reception of words in sentences expressed in different methods. Total communication scores were significantly higher than those for the Rochester Method and auditory-oral scores, and the former were higher than the latter.

Kluwin, T. 1981. The grammaticality of manual representation of English in classroom settings. American Annals of the Deaf 125.

Describes teacher communication in the classroom and compares deaf teachers, inexperienced hearing teachers, and experienced hearing teachers as they make use of the three-dimensional nature of manual communication to express content.

Kluwin, T. 1981. A rationale for modifying classroom signing systems, Sign Language Studies 31.

Describes classroom communication and argues that the invented sign systems include some inefficient elements that hamper the communication of content by focusing more on rigid English structure than on communication. Suggests that teachers and children modify invented systems to meet their own communicative needs.

Livingston, S. 1986. An alternative view of education for deaf children: Parts I & II. American Annals of the Deaf 131.2,3.

Presents an alternate view with two primary goals: thinking and learning through experience

of meaning making and meaning sharing, and the acquisition of literacy in English. Suggests that content-focused classroom instruction be in American Sign Language. Discusses Piaget's theories of development and claims that the use of manually coded English systems places unnatural receptive demands on deaf children and that American Sign Language is the most viable linguistic system available to those who cannot hear. Proposes that students can acquire English literacy through reading and writing.

Lou, M. (i.p.) History of language use in education of the deaf. In language Learning & Deafness, Strong ed. Cambridge: Cambridge University Press.

Traces the history of communication methods used in educating the deaf in the United States from 1817 to the early 1980s. Language use moved from manual approaches and American Sign Language to oral approaches, and then half way back, to "total communication." Detailed accounts of the manual period, the oralist period, and recent methods of manually coded English and total communication are provided. Qualifications of teachers of the deaf in the past are given as well as recommendations for teacher training in the early 1980s.

Marmor, G. & L. Petitto. 1979. Simultaneous communication in the classroom: How well is English grammar represented? Sign Language Studies 23.

Analyzes simultaneous signed and spoken components of utterances in the classroom of two teachers certified expert as they conducted regular classes at a residential school. Results indicate that signed utterances were predominantly ungrammatical according to rules both of English and of American Sign Language.

Mather, S. 1987. Eye gaze & communication in a deaf classroom, Sign Language Studies 54.

Describes the use of eye gaze by two teachers in two preschool classrooms for deaf children -- one a deaf native signer, the other a hearing native English speaker -- as it helps or hinders the regulation of turn taking during classroom story reading.

Meadow, K. 1968. Early manual communication in relation to the deaf child's intellectual,

social & communicative functioning, American Annals of the Deaf 113.1.

Compares intellectual and social functioning of deaf children with deaf parents with that of deaf children with hearing parents. Data from Stanford Achievement Test (reading, arithmetic, and overall grade level) and teacher and counselor ratings for intellectual functioning discloses significant differences in favor of deaf children of deaf parents. Equally significant differences were found in the area of social functioning.

Montgomery, G. & A. Lines. 1976. Comparison of several single & combined methods of communicating with deaf children.-In Changing Attitudes to Communication: Supplement to British Deaf News.

Reports on the results of testing children's comprehension through various methods including sound alone (28% comprehended), signs alone (93%), and lipreading, fingerspelling, signs combined (93%). Subjects' average age, 10 years, 6 months.

Moores, D. 1987. Educating the Deaf: Psychology, Principles & Practices. Boston: Houghton Mifflin.

A comprehensive and current volume that covers a wide range of issues in deaf education. Of particular relevance to bilingualism are reviews of literature and discussions of American Sign Language and the deaf community, including the relationship between mode of communication (medium of instruction) and academic achievement.

Moores, D. 1985. Early intervention programs for hearing impaired children: A longitudinal assessment. In Children's Language, Vol. V., Nelson ed. Hillsdale, NJ: Erlbaum.

Reports on a study of comprehension in deaf children with an average age of 7 years. Scores ranged from 44% for sound alone to 88% for simultaneous sound, speechreading, fingerspelling, and signs.

Murphy, H. & L. Fleischer. 1977. The effects of Ameslan vs. Siglish upon test scores,

Journal of Rehabilitation of the Deaf 11.

Reports on a study in which deaf students at California State University at Northridge received a lecture in "Ameslan (ASL) and Siglish." Prediction that no significant difference in scores related to difference in receiving system was confirmed. Suggests that the subjects performed as a bilingual group with about equal facility in two distinct manual systems and that while an interpreter and a deaf student in one-to-one situation normally would negotiate the nature of the transmission, this mixed group of CSUN students could function in either system.

National Center for Law & the Deaf. 1977. Formal request to the Department of Health, Education & Welfare, Office of Education and Welfare, to Office of Education, and to Office of General Counsel for Elementary and Secondary Schools, that sign language be considered a language for use in bilingual study projects under the Bilingual Education Act, Title VII of the Elementary and Secondary Education Act of 1965 (20 USC 8806), April 22, 1977.

Presents the rationale for bilingual education for deaf students in four general statements concerning deaf people's competence in American Sign Language and English, the linguistic nature of ASL, the nature of the deaf community, and prejudice toward the deaf.

Quigley, S. & P. Paul. 1984. Bilingualism & English as second language. In Language & Deafness, Quigley & Paul eds. San Diego: College Hill Press.

Survey results demonstrate great similarities between hearing-impaired children and children from minority cultures. Many researchers have suggested English as a second language (ESL) instruction be used in ASL/ESL bilingual programs. Suggests that other ESL studies on minority children will be helpful for such a program.

Schildroth, A. & M. Karchmer. 1986. Deaf Children in America. San Diego: College Hill Press.

Based on information collected by the Center for Assessment and Demographic Studies

(Gallaudet University) in its Annual Survey of Hearing Impaired Children & Youth. Includes a demographic overview of numbers and characteristics, description of types of educational programs, and discussion of communication issues, test issues, and post-secondary opportunities for hearing-impaired students.

Schowe, B. 1955. Sign language development. Ph.D. dissertation. The Ohio State University.

Defines six major categories in the language development of deaf children. One category demonstrates the modern methods for the development of language arts in the deaf child and points out that sign language, then an unrecognized linguistic system, may eliminate many of the idiosyncrasies of language in the deaf as well as facilitate the teaching of language arts to them. Suggests using sign language to improve English skills.

Stevenson, E. 1964. A study of educational achievement of deaf children of deaf parents, California News 80.

Examines the protocols of 134 students with deaf parents enrolled at the California School for the Deaf at Berkeley from 1941 to 1961, and compares them to those of 134 children with hearing parents. Reports that 38% of the children with deaf parents went to college, 9% of those with hearing parents, and that students with deaf parents achieved a higher educational level in 90% of the 134 paired comparisons.

Stewart, D. 1983. Bilingual education: Teachers' opinions of signs, Sign Language Studies 39.

Describes a questionnaire survey of teachers of the deaf in British Columbia to assess their opinion of two kinds of signing, American Sign Language and signed English. Opinions included: deaf children should learn signing at an early age, should use sign English as their base language, should eventually be bilingual in signed English and ASL, and teachers should be bilingual. The overall attitude was in favor of implementation of bilingual education for deaf children in total communication programs.

Stuckless, R. & J. Birch. 1966. The influence of early manual communication on the linguistic development of deaf children, American Annals of the Deaf 111.

Matches deaf children of deaf parents by several background variables with deaf children of hearing parents. English ability was compared on five dependent variables, and significantly better English performance was shown by the deaf children of deaf parents.

Thomas, R. 1985. How to evaluate total communication educational programs for deaf & hearing impaired children & youth: A primer for parents & professionals. Ardmore, PA: Newsletter of Action Alliance of Parents of the Deaf.

Discusses laws affecting educational options for deaf and hearing impaired children, which institutions have the most comprehensive programs, the need for a normal social environment, and the failure of mainstream programs to meet educational needs

Proposes that total communication is not a teaching modality only but should include values, attitudes, and emphasis on important curriculum -- not English proficiency alone. Discusses patronizing attitudes, pathological view of deafness, and lack of adult deaf role models.

Vernon, M. & S. Koh. 1970. Effects of manual communication on deaf children's educational achievement, linguistic competence, oral skills, and psychological development, American Annals of the Deaf 115.5.

Compares students who were exposed to fingerspelling and sign language from infancy with those exposed to oral communication alone (speech, speechreading, and amplification). Results suggest that the early use of manual communication produced better overall educational achievement, including superiority in reading skills and written language.

White, R. & V. Stevenson. 1975. The effects of total communication, manual communication, oral communication & reading on the learning of factual information in residential school deaf children, American Annals of the Deaf 120.

Reports comparison of 45 children from a total-communication school with 36 children from an oral school. No significant differences were noticed between manual-only and total-communication results, and both were superior to oral-only results. Subjects in both schools scored less than 50% on oral-only understanding.

Winston, E. 1986. Deaf students in hearing classes: Is spelling an appropriate placement? Manuscript in the Department of Linguistics & Interpreting, Gallaudet University.

Reviews methods of teaching spelling to hearing students and describes problems encountered by deaf students mainstreamed into hearing classrooms with interpreters for this class. Methods that rely on phonetic presentation, i.e. spelling words from teacher's pronunciation, are not compatible with the interpreting processes. Reviews related studies in

Woodward, J. & T. Allen. 1987. Classroom use of American Sign Language by teachers, Sign Language Studies 54.

Examines the kind of classroom communication used by teachers of hearing-impaired students. Annual Survey data files contain data on 1,888 teachers (89.1% hearing, 6.7% deaf, 4.3% hard of hearing). Direct and indirect questioning on questionnaire determined use of American Sign Language. Of 140 teachers who claim to use ASL, results indicate that six are actually using the language (i.e. not using a form of signed English) and 19 others may be using it.

Woodward, J., T. Allen & A. Schildroth. 1985. English Teachers of the Deaf: Background & Communication Preference. Washington: Gallaudet Research Institute's Center for Assessment & Demographic Studies.

Examines the type of communication teachers of reading and English use in the classroom to teach English to deaf students and examines important background variables that influence the type the teachers prefer. Suggests that few deaf students achieve native competence in English, because: (1) the great majority of teachers are hearing; (2) one third of the teachers use speech only to represent English; (3) most hearing teachers who do sign acquired their sign skills after the age of 18; (4) the hearing signing teachers rate their

signing abilities as lower than their spoken English abilities; and (5) the majority of teachers who sign report that they do not manually represent all English morphemes when they are teaching reading or English. Discusses the importance of using American Sign Language to represent or translate for English literacy skills.

Woodward, J., T. Allen & A. Schildroth. 1985. Teachers & Deaf Students: An Ethnography of Classroom Communication. Washington: Gallaudet Research Institute's Center for Assessment & Demographic Studies.

Provides a description of the classroom communication practices of a large number of teachers of the deaf in the United States. A language usage questionnaire sought patterns used and codes and channels employed in order to isolate relevant characteristics of different classroom communication situations, to propose a model based on these classifications, and to report on the prevalence of different communication patterns in classrooms for deaf children in the United States. Gives a brief history of educational practices in the U.S. and discusses the confusion over total communication, which is contrasted with the model of preferred communication.

Woodward, J., T. Allen & A. Schildroth. 1985. Linguistic & Cultural Role Models for Hearing Impaired Children in Elementary School Programs. Washington: Gallaudet Research Institute's Center for Assessment & Demographic Studies.

Explains the importance of cultural education and language acquisition for deaf children at school, because sign language and deaf culture are unlikely to be acquired in the homes of deaf children, fewer than 5% of whom have deaf parents. There are often severe problems in communication between hearing parents and deaf children, so that the latter acquire little English at home. The cultural values of hearing people, which are learned at home, are being minimized among deaf children.

6. Language Attitudes / Bilingualism & Deafness

Benson, A. 1979. An attitude study. Teaching English to the Deaf 6.1.

Describes a survey of deaf and hearing people's attitude toward American Sign Language and English. A questionnaire with 16 bipolar adjectives elicited subjects' attitudes. Results indicate that none of the variables examined, including age, sex, hearing status, occupation, or level of education, resulted in significant differences in attitude that showed preference for either American Sign Language or signed English. All respondents, however, did find ASL to be more beautiful, creative, pleasant, expressive, exciting, graceful, flexible, and powerful than signed English, and signed English to be more precise and complete than ASL.

Bergman, E. 1976. Deaf students speak up: How they feel about the teaching & teachers of English, Teaching English to the Deaf 3.1.

Describes the ways twelve Gallaudet sophomores feel about their experiences as students in English classes in schools for the deaf before attending Gallaudet College, and their suggestions for improving the teaching of English to deaf children.

Berke, L. 1978. Attitudes of deaf high school students toward American Sign Language. In Caccamise & Hicks, eds. q.v. (Section 1 above).

Describes deaf students' attitudes toward American Sign Language in three different settings: the general academic setting, the manual/visual communication setting, and the extra-curricular activity setting. Describes students' misconceptions about ASL and suggests reasons for them.

Curry, J. & R. Curry. 1978. Deaf students can use their fluency in American Sign Language to develop English competency. In Caccamise & Hicks, eds. q.v. (Section 1 above).

Describes an attempt to use a bilingual approach in teaching deaf adolescents and young adults. Discusses the misconceptions about American Sign Language and English that had to be dealt with before English could be taught through ASL.

DiGiovanna, M. 1981. ASL test? The Buff & Blue 90.12 (Student newspaper, Gallaudet

College).

Describes a survey on American Sign Language conducted at Gallaudet College to: find the attitudes related to communication between deaf and hearing students and to promote communication between them by increasing awareness and understanding. All in both groups agreed that deaf students tend to switch from ASL to English when communicating with hearing students; 97% of 39 hearing and 61% of 45 deaf students agreed that ASL has its own grammatical structure; 79% of deaf students and 17% of hearing students agree that it is important to learn ASL.

Kannapell, B. 1985. Language choice reflects identity choice: A sociolinguistic study of deaf college students. Sociolinguistics Ph.D. dissertation. Georgetown University.

Describes the demographics of a representative sample of deaf undergraduates; investigates their diverse linguistic/communicative repertoire and social variables that contribute to their attitudes toward ASL and English and their users; investigates the relationship between self-reported data and the assessment by professionals; and probes the students' feelings and thoughts about language and its users through interviews. Makes recommendations for change in deaf education.

Lentz, E. 1977. Informing deaf people about the structure of American Sign Language. In Proceedings of the (lst) National Symposium on Sign Language Research & Teaching. Silver Spring, MD: National Association of the Deaf.

Describes the misconceptions of deaf community-college students about the structure of ASL; e.g. that ASL is poor English, short-cut English, simple language, deaf language, and street language.

Levine, P. 1987. Attitudes of hearing children of deaf parents. Manuscript in the Department of Linguistics & Interpreting, Gallaudet University.

Describes a pilot study of the attitudes of hearing children of deaf parents towards English, American Sign Language, English manual codes, interpreting, language choice,

self-evaluation of communicative skills, and deaf education -- using interviews and questionnaire data from four subjects.

McClave, E. & S. Mather. 1987. Attitudes toward foreign sign languages. Manuscript in the Department of Linguistics & Interpreting, Gallaudet University.

Describes a pilot study designed to identify attitudes toward foreign sign languages. Using a Lickert scale, American deaf senior citizens recorded their personal reactions to signing of deaf male foreign signers whose countries of origin were not divulged. Reactions to the signers' appearances were distinguished from reactions to their languages. A definite order of preference emerged as well as some uncertainty in labeling all of the foreign sign systems real languages.

Meath-Lang, B. 1984. Deaf persons' views on English language learning: Educational & Sex implications. In Interpersonal Communication & Deaf People, Hoemann &

Wilbur eds. (Working Papers from Conference on Sociology of the Deaf). Washington, DC: Gallaudet College.

Focuses on deaf students' views of English language teaching and learning. Eighty-seven deaf college students were asked to write describing their experiences in formal English education. Three response categories emerged: (1) students perceived English as a thing or object to learn in the classroom; (2) the concept as the self-as-communicator; and (3) the concept of deafness as an educational condition.

Schein, J. 1968. The Deaf Community. Washington, DC: Gallaudet College Press.

Describes the portion of a demographic study of deafness that focused on the self-evaluation of communication skills. Results of deaf respondents' self-rating on speech, lipreading, signing, reading signs, fingerspelling, and reading fingerspelling are reported (See also listing in Section 1).

Schein, J. & M. Delk. 1974. The Deaf Population in the USA. Silver Spring, MD: National Association of the Deaf.

See above. In all aspects of communication, the two most educated groups tend to rate themselves higher than or equal to the less-educated groups.

Sussman, A. 1973. An investigation into the relationship between self concepts of deaf adults & their perceived attitudes toward deafness. Ph.D. dissertation, New York University.

Concludes that a deaf person's evaluation of his or her own sign language ability is not related to self concept, but that there is a positive relationship between a deaf person's speech and speechreading ability and self concept. Likewise, no relationship was found between self evaluation of sign language ability and hearing people's attitudes, but a positive relationship between speech and speechreading ability and hearing people's attitudes.

Sutcliffe, R. 1975. A study of language as a determinant of group cohesiveness. Master's thesis, University of Maryland.

Reports on relationships of group cohesiveness and communicative preferences among deaf student leaders at Gallaudet College. The former was measured by choice of eating areas in the cafeteria. Study body government officers tended to eat together and shared the characteristics of being born deaf, learning sign language before the age of six, having deaf parents and/or siblings, and having attended residential schools. But Student assembly members' eating areas were scattered, and they preferred English-like signing. Of the latter group, fewer than 75% lost their hearing before age 3, more than half had hearing parents, and two-thirds went to residential schools.

Ward, J. 1987. Language attitudes: Using the matched-guise method to assess attitudes of prospective teachers of the deaf toward American Sign Language and English. Manuscript in the Department of Linguistics & Interpreting, Gallaudet University.

Describes a modification of the matched-guise technique (Lambert 1960), in which 55 prospective teachers of the deaf rated users of ASL and English and responded to covert

attitude questions about signers and to overt attitude questions about ASL and English in the classroom; comprehension was also evaluated. Implications are drawn on the effect of teacher attitudes on deaf children and the role of teacher training programs in the development of attitudes.

The Editor regrets that he omitted some of the marking for nonmanual behavior in four examples presented in the article "Head Thrust in ASL Conditional Marking," (Liddell) Sign Language Studies 52, 243-262.

The four examples on pages Z58 and Z59 are reproduced below as they should appear:

```
                       ht
                    rot-L
          t     brows-up
(13)   TEST    GET - A_i   PRO.1 RELIEVED PRO.1
```

"The test, if I get an A on it, I will be relieved"

```
                                     ht
                                  Rot-L
                         t     brows-up
(14) J-O-H-N K-E-N-N-E-D-Y  STILL LIVE WELL AMERICA LOOK^LIKE WELL
```

"As for John Kennedy, if he were still alive, what would
America be like?"

```
                                  ht
                               Rot-L
                       t     brows-up
(15) CAR, 1984 D-A-T-S-U-N    ARRIVE_i   PRO.1 READY BUY PRO.1
```

"As for the car, a 1984 Datsun, if it arrives, I am ready to
buy it."

```
              ht
           Rot-L
        t brows-up      t                                    n
(16)  TEST GET - A    PART B  NOT-HAVE-TO STUDY PRO.2 NOT-HAVE-TO
```

"The test, if you get an A on it, then as for part B,
you won't have to study it"

USING MNEMONIC EXPLANATIONS TO IMPROVE SIGN LEXICON LEARNING WITH CHILDREN & YOUNG ADULTS

Joe D. Stedt, John Salvia & Keith E. Nelson

Abstract.

One hundred two naive subjects in three age groups were trained and tested on recalling the meanings (English glosses) of 32 ASL nouns and 32 ASL verbs arranged in 32 sentences. Half the signs were highly translucent; i.e. connection between the sign s meaning and appearance was easily perceptible. Half the sentences were presented with a mnemonic explanation; e.g. The sign for cow shows the cow horn. Test responses were spoken translations of the sentences seen. Subjects did significantly better on signs of high translucency and signs learned with mnemonic explanations; but contrary to expectation the fifth graders did better than both the second and the eleventh graders.

Aids to Learning.

American Sign Language is learned quickly and competently by deaf children when their parents sign to them as infants (Moores 1981). When a child's parents do not know sign language, it becomes much more difficult to teach the child manual language. One approach, and probably the best approach, is to teach the parents sign language so they in turn can teach the child.

For years teachers have encouraged parents to learn sign language in an effort to improve the language development of their deaf children. Because it can be difficult to teach parents sign language, it is necessary for researchers to discover the most efficient sign teaching methods.

Early research on sign language produced interest in iconicity and learning. One notable language researcher, Roger Brown, helped to raise important issues concerning iconicity

(i.e. how much a sign looks like its referent) by suggesting that sign languages may be easier to learn than spoken languages because of the iconicity of signs (Brown 1977).

As research on iconicity became more specific, investigators began considering the concepts of transparency and translucency. Research then started investigating the efficiency of sign learning by controlling the translucency level of the signs used in their experiments. Translucency is one way to view the iconicity of signs; it involves the cognitive connection that can be made when a sign and its meaning are presented simultaneously. Thus, when one is shown the sign for 'tree' as the word tree is spoken, if a connection between the sign and the word is easily seen, the sign is translucent. Some signs immediately evoke such a cognitive connection; others do not. Those easily connected are called signs of high translucency, and those that do not evoke such cognitive connections are called signs of low translucency.

There have been several studies of the translucency of signs and the sign learning of hearing subjects naive to sign language. Generally it has been concluded that signs high in translucency are easier to remember than signs that are low (Luftig & Lloyd 1981, Luftig 1983, Luftig, Lloyd & Page 1982). In addition, Page (1985) found that children and adults perceive translucency in a similar fashion.

While translucency is an important variable in early sign learning, concreteness can also affect the learning rate. Some signs represent concrete objects (e.g. 'table'), while others represent more abstract concepts (e.g. 'time'). Luftig and Lloyd (1981) have discovered that the concreteness of the sign can influence how readily it can be learned. Using college student subjects, they presented signs differing in both concreteness and translucency. Both change the learning rate: when both concreteness and translucency are high, signs are easier to learn; when both are low, the signs are learned more slowly by subjects; and therefore Luftig and Lloyd recommend teaching signs high in both translucency and concreteness to beginners.

Another factor that might influence the learning of signs is the use of mnemonic devices; i.e. a "rule or system of rules that has been developed to improve our ability to recall items " (Klatzky 1980:120). Rehearsal is one mnemonic strategy: the subject repeats the stimulus,

either silently or aloud. Another is imagery: the subject creates a mental image of what needs to be remembered. Still another is cueing: the subject uses one event or item to cue the memory of another. In a variety of research endeavors, mnemonic devices have been shown to be effective in improving memory (e.g. A. Brown 1975, Flavell 1970, Flavell et al. 1966, Kail & Hagen 1982, Ornstein 1978).

As a child develops, ability to remember using mnemonic devices improves. Kail and Hagen (1982) have condensed the development of mnemonic strategies into three stages: (1) five and six year old children use the strategies only inconsistently; (2) from ages seven to eight there is a transitional period in which the use of mnemonic strategies depends on the situation and context; and (3) after the age of 10 mature strategies begin to emerge and improve through the teen years. It should be noted that there will be a definite improvement from the beginning to the end of Stage 3; at the end of this stage the teenage youngster will use mnemonic techniques as adults do.

Because mnemonic strategies have been shown to enhance memory, it seems that such an approach could be used to aid beginning students in their learning of signs. It has also been suggested that such strategies be used for the acquisition of sign language skills; e.g. Klima and Bellugi have stated that deaf people, when trying to teach signs to hearing people, "stress the iconic potential of the signs, often inventing some iconic interpretation for mnemonic purposes" (1979:33). It is important to note that mnemonic devices need not be used in association with a probable etymology of the word. Because the true etymology of a sign is often not known, those devices that are linked to the etymology of a sign are probably best referred to as folk-etymologies or pseudo--etymologies. It must be stressed that only in rare instances is the etymology of a sign traceable (see Stedt & Moores 1981). The authors of the present study prefer to use the term mnemonic device or mnemonic explanation, because we never assume knowledge of a sign's etymology.

The use of mnemonic techniques is advocated by Costello, who claims that the "mnemonic clues" given in her sign language instruction manual will help the learner remember the signs. She adds that some of these mnemonic clues "might refer to the signs' origins but no attempt was made to research or explain the derivation of the signs" (Costello 1983:xv). Riekehof also advocates the use of mnemonic devices, actually pseudo-etymologies

intended to make the recall of signs more efficient. She gives the following instruction:

First, look at the ... sign. Next, read the origin of the sign so you will understand the reason for a particular sign formation. Often the relationship between a sign and its meaning is quite obvious. When the origin is understood, a sign is more easily remembered. (1978:5)

Tieso and Story, in a similar vein, have written a sign language instruction manual that uses word/picture association as a mnemonic device to aid in the acquisition of sign language ability. They present an illogical picture association memory process that produces "pictures for the student... in such a manner that the visual images are unforgettable... Once the association... is established, the student will retain the knowledge quickly and effectively" (Tieso & Story 1981:11).

Two significant ideas emerge from the teaching strategies recommended by the authors cited above: (1) it is fairly common for those teaching signs to use some form of mnemonic explanation, and (2) it is assumed that the use of these mnemonic explanations will improve the recall of signs by the learner. Even though there seems to be consensus of these handbook authors that mnemonic explanations aid in the recall of signs, no data are presented to substantiate their belief. Moreover, despite the prevalence of the belief, there are currently no data available to show that mnemonic explanations or any form of mnemonic device can actually assist in the learning of signs.

Testing the Assumption.

The present study sets out to test this assumption about the effect of mnemonic explanations on sign learning. It operates on another assumption: that it is most advantageous for hearing members of a deaf child's family to be able to communicate with the child in sign language, and that the use of sign language will help both the linguistic and the psychosocial development of the deaf child (Moores 1981). In order to teach these hearing family members sign language it is desirable to find the most efficient means of instruction.

It has already been established that the translucency and concreteness of signs can influence the rate of learning. The present study undertakes to discover whether mnemonic devices

may also influence the rate of learning when they are employed as mnemonic explanations of the sign's meaning.

To observe developmental effects we used three age groups, according to the stages described by Kail and Hagen (1982). Because children in the first stage (5-6 years) use mnemonic devices inconsistently, we did not use any of them. Stage 2 (7-8 years) is a good group, because these children are beginning to employ mnemonic strategies spontaneously. The beginning of Stage *3* (10-11 years) is also a logical choice for the present study and finally a group of 17 year old students was used to represent adult -- or the most advanced -functioning of Stage *3.* Thus we set out to investigate translucency again but with the addition of mnemonic explanations, in order to find the most efficient approach to teaching signs to people who need them to communicate with a deaf family member, or otherwise want to learn signs. We assume that a core lexicon (vocabulary) must be taught as soon as possible for the benefit of all family members. Even though translucency has been shown to improve the rate of learning signs, it is necessary to reinvestigate this area to see if translucency interacts with mnemonic explanations. The present study also seeks to discover whether mnemonic explanations can be helpful in sign learning and if they can be used with children as young as eight years old.

The experiment.

Thirty-four second grade students comprised the first group (mean age, 8;1; S.D. 0.39*).* The second group was made up of 34 fifth grade students (mean age, 11;3; S.D. 0.39); and the third of 34 eleventh grade students (mean age, 17;1; S.D. 0.5). Adults were not included because of the difficulty of finding a large group not members of a skewed population; e.g. college students. All subjects were taken from public schools in rural central Pennsylvania. All had normal intelligence and hearing and normal or corrected vision, as indicated by school records and confirmed by the classroom teachers. Boys and girls were distributed evenly only in the fifth-grade sample. There were more girls than boys in the other two groups; 20 girls and 14 boys in the second-grade group, and 23 girls and 11 boys in the oldest group).

The experimental design is 2 by 2 by 3: high or low translucency, present or absent

mnemonic explanation, and grade 2, 5, or 11. There were four experimental conditions for all subjects with eight sentences each of one sign noun and one sign verb:

1. High translucency signs with mnemonic explanation.

2. High translucency signs w/out mnemonic explanation.

3. Low translucency signs with mnemonic explanation.

4. Low translucency signs w/out mnemonic explanation.

The stimuli were signs taken from the lexicon of American Sign Language. In all 64 signs were used, 32 verbs and 32 nouns, ultimately grouped in 32 sentences. The selection of the signs was based on their translucency as given by Luftig and Lloyd (1981), in which subjects rated signs on a 1 to 7 scale (with '1' low and '7' high). A similar rating system adopted from other researchers is given in the same source.

Signs used in the present study were selected to have either high or low translucency. Because verbs tend to have a higher degree of translucency than nouns (Luftig et al. 1982), the verbs in the sample in the present study rate higher in translucency:

Translucency mean range   Concreteness

Nouns, low 2.47 1.77-3.97   6.74 6.3-7.0

Verbs, low 3.74 2.14-4.85   4.93 3.1-6.1

Nouns, high 5.49 4.6-6.88   6.83 6.1-7.0

Verbs, high 5.94 5.25-6.54   4.95 2.9-6.0

Every effort was made to control the concreteness of the signs in the study. Because low

concreteness has been shown to reduce the rate of sign learning, only signs of high concreteness were used (see above). Again, it was expected that the verbs would have lower concreteness than the nouns in this sample, reflecting a more general pattern found in nouns and verbs of languages generally.

We constructed sentences from the selected nouns and verbs by combining pairs that made sense; e.g. the signs FLOWER and WASH cannot be made into a sensible sentences but DRESS and WASH can and were used for a sign sentence. Because American Sign Language does not employ a copula or articles, a two-sign statement can be considered grammatically correct. Sentences were formed in either simple declarative or imperative mode. Signed sentences used (e.g. TEACHER SHOUT 'The teacher shouts', COW WALK 'The cow walks', TOUCH FLOWER 'Touch the flower', and SHOW TICKET 'Show the ticket') are both acceptable and understandable ASL forms (according to Humphries et al. 1980). Sentences instead of single signs were used as stimuli because (1) words have been the focus of a variety of similar studies but sentences have not, and (2) sentences may be more pragmatic and direct when trying to teach basic sign skills.

To make the signs consistent for presentation, their citations were taken from A Dictionary of American Sign Language (Stokoe et al. 1965). If there were any questions regarding the citation forms, an additional reference (Riekehof 1978) was consulted. The signs were then field-tested with deaf adults by asking if they could understand the sentences.

The sign sentences were presented to the subjects by the experimenter, a male in his mid thirties. Although he has normal speech and hearing, he has been instructing both hearing and deaf students in sign language for more than a dozen years. In a pilot test deaf persons understood all the signs in his signing of every sentence later included in the study, and the fluency and clarity of presentation did not introduce a confounding variable.

Before the presentation of the sentences we asked each student about previous exposure to sign language. None had enough knowledge to threaten the validity of the study. None of them knew more than 15 signs, and more importantly, none knew any of the signs used in the study. Some knew some of the manual alphabet and others knew some signs from the

Sesame Street television program.

A11 of the subjects in this study received the following instructions before the start of the experiment: I am going to show you some sentences in sign language. Each sentence will have two signs. After some of the signs I will give you an explanation to help you remember the signs. On other sentences you will have to remember the sentences the best you can. After I give you 16 sentences we'll see how well you have remembered the sentences then I will show you 16 more sentences. Do you have any questions? None of the subjects had any questions and the presentation followed immediately.

The sentences were shown to the subjects simultaneously with their spoken translation; e.g. "COW WALK" was signed as "The cow walks." One learning trial (16 sentences, 32 signs) was given; then were tested on those sentences. After the first trial session the subjects were given a second learning trial (16 different sentences with 32 different signs) in a condition different from that in the first session e.g. if the first trial used high translucency signs, the second trial of the same subjects used low translucency signs the two were never mixed in the same learning trial. In every condition as many subjects started their learning trial with high as started with low translucency signs. Thus, each subject was given 16 sentences of one translucency level followed by a test and then 16 sentences of the other translucency level and a second test.

We tested the second-grade students individually but the fifth and eleventh graders in group sessions. The second graders were asked to say the sentence that corresponded with a given signed sentence. The older subjects were given both the learning and the test trials then asked to write the appropriate translations (sign glosses).

In each learning trial the subjects were given mnemonic explanations on alternating sentences; if the first sentence had an explanation, the second did not. If a sentence was presented without explanation it was signed (and spoken) twice in order to make the time for explained and unexplained presentations more nearly equal.

The explanations used in the study were taken from a variety of sources, including Stokoe (et al. 1965), Riekehof (1978), and suggestions from sign teachers and deaf people. For

example, with the sign sentence COW WALK 'The cow walks', the sign COW was produced (thumb of 'Y' hand at temple, wrist slightly retroflexes) and the students told, "The sign for cow shows the cow horn," and the 'horn' was pointed out. Then they were shown the sign for walk (alternating wrist extension and flexion both hands in front of signer) and told, "The sign for walk shows one foot moving in front of the other."

The learning trials consisted of four equivalent randomized sequences. While there were not constraints on the randomization of the learning trials, the test trials met several conditions. To protect against regency effects none of the sentences presented in the last three places of the learning trials were in the first three Places of the test trials.

Results.

Each subject, after a learning trial of 16 sentences, saw a test trial. A second learning trial of 16 sentences was then followed by another test. Each subject, therefore, saw a total of 64 signs, with 16 signs occurring in each of the four experimental conditions. The signs were placed in their appropriate classifications, using a 2 X 2 factorial design: high and low translucency, with and without mnemonic explanation. The mean scores of the groups on the four experimental conditions are shown in Table 1. Signs in Condition 1 (high translucency, w/ mnemonics) are remembered better than the signs in the other three conditions. The average of correct responses across subjects was 14.37 signs remembered out of 16. Conversely, the signs in Condition 4 (low translucency, w/o mnemonics) were least well remembered; subjects remembered a mean of 8.29. Signs in Condition 2 (high translucency, w/o mnemonics) were remembered slightly better than signs in Condition 3: 12.99 and 12.72 respectively.

Grade Level	Condition #1	Condition #2	Condition #3	Condition #4	All Conditions Combined
Second (n=34)	13.09	10.41	11.62	6.06	41.18
Fifth (n=34)	15.21	14.76	13.35	10.18	53.50
Eleventh (n=34)	14.82	13.79	13.21	8.65	50.47
Mean ($\bar{X}$) (n=102)	14.37	12.99	12.72	8.29	48.38

Table 1. Mean correct responses by grade level & condition.

Condition #1 = High translucency signs with explanations.

Condition #2 = High translucency signs without explanations.

Condition #3 = Low translucency signs with explanations.

Condition #4 = Low translucency signs without explanations.

The mean responses for translucency alone can be calculated from Table 1 by adding Conditions 1 and 2 for high translucency and Conditions 3 and 4 for low translucency. High are remembered better than low across all subjects (27.36 hi, and 21.01 low, respectively, out of 32).

By combining scores for Conditions 1 and 3 and comparing that sum with the sum of Condition 2 and 4 scores, the effect of mnemonics can be compared. The average for all 102 subjects was 27.09 signs with mnemonics remembered (of 32) to 21.28 signs without mnemonics.

In order to discover if the observed differences in the sample could be expected in a larger population an analysis of variance with repeated measures was conducted. The summary of the analysis is presented in Table 2. Although the summary indicates significant main effects for age, translucency, and mnemonics, the 2-way interactions prohibit direct interpretation of the main effects. Age (grade level) and explanation (A X C) and translucency and explanation (B X C) interacted. To examine this complex pattern of interaction, simple effects were examined.

As in previous studies, it was predicted that the high translucency signs would be remembered better than low. A Tukey HSD procedure (Winer 1962) was used to compare the differences in the high and low translucency signs in the mnemonics condition (Conditions 1 & 3). The difference was significant. (F (1,99) = 66, p 0.001; F critical score = 3.94 for 0.05 level of significance, and 6.9 for 0.01 level of significance.)

The same Tukey procedure was used to compare high and low translucency signs when mnemonics were not used (Conditions 2 & 4). This indicated that the high translucency signs are still easier to remember than the low when mnemonics are removed from the analysis (F (1,99) = 52, p< 0.001). More importantly, the high versus low translucency differential was far wider without than it was with mnemonics.

Therefore, the data indicate that high translucency signs are easier to remember, with and without mnemonic explanations. In addition, the significant main effect for translucency (F (1,99) = 218, p< 0.001), with no interaction with grad level allows for the inference that signs of high translucency are remembered better than signs of low translucency for all three grade levels. Again, this result was predicted by previous research findings.

Source	Sums of Squares	Mean Squares	df	F ratio	Probability
Between Subjects					
A	701.04	350.52	2	25.89	< .001
Error	1340.48	13.54	99		
Within Subjects					
B	1026.00	1026.00	1	218.74	< .001
AB	3.89	1.94	2	0.41	< .66
Error	464.36	4.69	99		
C	861.88	861.88	1	217.62	< .001
AC	91.27	45.63	2	11.52	< .001
Error	392.10	3.96	99		
BC	237.06	237.06	1	65.53	< .001
ABC	3.03	1.52	2	0.42	< .66
Error	358.15	3.62	99		

Table 2. Summary, analysis of variance. N = 34 in each group; total 102 subjects.

A = Age as specified by grade level 2, 5, or 11.

B = Translucency (high/low)

C = Explanation (with/without)

Another variable investigated was age (as determined by grade level). It was found that there was a significant interaction between age and mnemonics (A X C). Again the Tukey HSD procedure was used to compare all three age groups in the mnemonic conditions (1 & 3) and the no mnemonic conditions (2 & 4). For the mnemonic conditions, the fifth graders did better than the second graders ($F(1,99) = 14.5$, $p < 0.01$). Although the eleventh graders

did better than the second graders (F (1,99) = 10.7, p~ 0.01), they did not perform better than the fifth graders (F (1,99) = 11.3, ns).

Looking at the no-mnemonic conditions (2 & 4), we see a different pattern. Fifth grade students in these conditions remembered more signs than did either of the other two groups. The fifth graders were better at remembering signs than the second graders (F (1,99) = 69.8, p < 0.001), and even better than the eleventh graders in the same condition (F (1,99) = 6.1, p 0.05).

Another facet of the present study that needs more illumination concerns how signs are remembered with and without mnemonics. As shown in Table 2, the main effect for mnemonic explanations is extremely strong (F (1,99) = 217.6, p< 0.001). As said, mnemonics interacted significantly with translucency and with age. The effect of mnemonics existed in both high and low translucency conditions. High translucency signs were significantly better remembered when mnemonics were provided (F (1,99) = 21.3, p 0.01). Likewise, low translucency signs with mnemonic explanations were even easier to remember than those without such an explanation (F (1,99) = 220.6, p< 0.001). It should be noted that signs with mnemonics were significantly better remembered than signs without them in all age groups.

An analysis of simple effects (see Table 3) compares Conditions 1 and 2 with Conditions 3 and 4 (sentences with mnemonics versus sentences without in the same translucency). Table 3 shows that signs with explanations are remembered better by every group (t = 8.1, df = 33, p< 0.001 for second graders; t - 3.6, df = 33, p< 0.001 for fifth graders; and t = 5.5, df = 33, p< 0.001 for eleventh graders). Thus signs with explanations are always remembered better when the translucency is held constant. In addition, the contrast in the mnemonics/no-mnemonics conditions was greatest for the youngest students in the sample, who performed at a comparatively lower level than the two older groups on the signs without mnemonic explanations.

	Conditions 1 & 3	Conditions 2 & 4	n	df	t	Probability
Second Grade	24.71	16.47	34	33	8.1	< .001
Fifth Grade	28.56	24.94	34	33	3.6	< .001
Eleventh Grade	28.03	22.44	34	33	5.5	< .001

Table 3. *A t-test comparison of mean recall in Conditions 1 & 3 and 2 & 4 for each group (w/ & w/o explanations).*

	Condition 2	Condition 3	n	df	t	Probability
Second Grade	10.41	11.62	34	33	.39	ns
Fifth Grade	14.76	13.35	34	33	.20	ns
Eleventh Grade	13.79	13.20	34	33	1.05	ns

Table 4. *A t-test comparison of mean recall in Conditions 2 & 3 (high transl. w/o & low transl. w/ mnemonic explanations).*

Because the research literature has devoted some attention to the notion that highly translucent signs are easier to remember than signs of low translucency, it is of interest to see if the effect of explanations can counteract some of the effects of low sign translucency. To examine this a t-test was performed comparing each group's performance on Condition 2 (high translucency, no mnemonics) and Condition 3 (low translucency, with mnemonics).

These results are given in Table 4. If the addition of mnemonics can improve the performance of the low translucency group to a level that is equal to the high translucency group of signs, then mnemonic explanations can be considered to override some of the effects of low translucency. Consistently across ages, there were no significant differences between Conditions 2 and 3 (t = 0.39, df = 33, ns, for second graders; t = 0.2, df = 33, ns, for fifth graders; t = 1.05, df = 33, ns, for eleventh graders).

Discussion.

The present study investigated the previously researched area of sign translucency while maintaining control over concreteness. In addition, the factor of mnemonic explanations was investigated. It confirms previous findings that the translucency of signs can influence the rate of acquisition. Signs of high translucency were remembered better than signs of low translucency in the present study.

The data gathered on signs presented with and without mnemonic explanations adds new information. The explanations were shown to be a consistently effective way to help sign learning in all the age groups sampled in this study. In other words, students of any age in this study benefited from the introduction of mnemonic explanations when learning signs.

It has been suggested that the translucency of a sign lexicon can be manipulated in such a way that signs could be learned easier. Unfortunately, many of the signs that need to be taught are not translucent -- a problem when trying to introduce easy to learn signs. It has been shown here that the use of mnemonic devices can speed the learning of signs that are not translucent. As was shown in Table 2, the effects of translucency are not as great when mnemonics are added.

This is an important finding, because it indicates that the use of mnemonic explanations is always helpful, regardless of translucency. Therefore it appears that using mnemonic explanations can speed the learning of virtually any sign. The addition of mnemonic explanations makes it possible to teach any sign, not restricting early lessons to signs that are high in translucency.

Two features of the present study may be open to criticism: First, the instructions given to the subjects might introduce a bias (or differential expectations) by telling them "... I will give you an explanation to help you remember the signs. On the other sentences, you will have to remember the sentences the best you can."

This is a weak criticism because (1) the alternating presentation of mnemonics / no-mnemonics made it difficult for the subjects to remember which signs had been given with mnemonics, thereby making bias difficult to establish; and (2) the power of the results indicates that something much stronger than mere bias is in operation in the present study.

Second, it could be suggested that the same results could be obtained by merely giving the subjects enough information to construct their own cognitive associations. This is a valid point, and research is currently being designed to investigate this question. In the present study, however, such an approach was not practical because of time and the immaturity of the youngest subjects. It should be pointed out that the mnemonics used in the present study may not have been the best stimuli. The pseudo--etymologies used could possibly be improved. They have been shown here, however, to be an effective way of improving memory.

Implications.

The present study has confirmed a notion that has been held for many years: that the acquisition of a basic lexicon of signs by hearing learners can be aided by the use of mnemonic devices. Moreover, it has been shown that while high translucency signs are easier to remember than low, the effects of low translucency can be partially mitigated by the use of mnemonic devices. When the effects of high translucency and mnemonic devices are combined, sign learning is accelerated.

These findings have wide-reaching implications for the teaching of sign language, especially teaching family members of a deaf person. Other researchers have suggested that signs of high translucency should be the core of the core lexicon in initial sign learning. This approach, while perhaps an efficient one, may exclude certain necessary signs. The use of mnemonic devices allows the sign teacher the full range of signs that need to be taught. It

also allows for the possibility of teaching a relatively large corpus of signs in a short period of time. In the present study it was shown that the average second grader in the sample could identify about 41 signs after approximately 15 to 20 minutes of training.

As in all research, there are limitations to the present study. One of these concerns the long-term effects of the recall of sign meanings. Because none of the signs were tested long after presentation, the effects of recall in mnemonic situations are unknown, as are the effects of long term memory of signs of different translucencies. Replication of the present experiment using a two week latency would be enlightening to see what patterns of remembering and forgetting would emerge.

Additionally, it would be interesting to replicate the present study using younger students, perhaps as young as four years old. This would allow the results to be generalized to young siblings of deaf youngsters (although the conditions under which they learn signs may be quite different from those of psycholinguistic research).

Finally, there could have been some effects of the use of sentences in the present study; e.g. the possibility of one sign helping to cue the other in given sentence. It was not possible to look at this possibility for two reasons. First, in some conditions (such as Condition 1) subjects did not make enough mistakes to permit analysis. Second, even in Condition 4, where most mistakes were made, a pattern did not emerge (i.e. all of the subjects made different mistakes). More information could be gathered by using more sentences and longer sentences to force more mistakes.

Note

1. The authors take no position here on the type of sign system being used, whether American Sign Language, some form of English, or a Pidgin-like form. The assumption is made that a sign lexicon must be learned initially regardless of what grammatical form is used, and therefore this study should apply to the seminal steps of teaching any form of manual language.

References

Brown, A.

1975 The development of memory. Advances in Child Development & Behavior, Reese ed. New York: Academic Press. 104- 152.

Brown, R.

1977 Why are signed languages easier to learn than spoken languages? In Proceedings of the (lst) National Symposium on Sign Language Research & Teaching. Silver Spring, MD: National Association of the Deaf. 9-24.

Costello, E.

1983. Signing: How to Speak with Your Hands. New York: Bantam Books.

Flavell, J.

1970 Developmental studies of mediated memory. In Advances in Child Development, Rees & Lipsitt eds. New York: Academic Press. 5, 13-299.

-----, D. Beach & J. Chinsky

1966 Spontaneous verbal rehearsal in a memory task as a function of age, Child Development 37, 283- 199.

Friedman, L. (ed.)

1977 On the Other Hand. New York: Academic Press.

Humphries, T., C. Padden & T. O'Rourke

19~30 A Basic Course in Manual Communication. Silver Spring, MD: T.J. Publishers

Kail, R. & J. Hagen

1982 Memory in childhood. In Handbook of Developmental Psychology, Wolman ed. Englewood Cliffs, NJ: Prentice Hall. 350-366.

Klatzky, R.

1980 Human Memory: Structures & Processes (2nd edn.J. San Francisco: Freeman & Co.

Klima, E. & U. Bellugi

1979 The Signs of Language. Cambridge, MA: Harvard University Press.

Luftig, R.

1983 Translucency of sign & concreteness of gloss in the manual sign learning of moderately/severely mentally retarded students, American Journal of Mental Deficiency 88, 279-286.

-----, & L. Lloyd

1981 Manual sign translucency & referential concreteness in the learning of signs, Sign Language Studies 30, 49-60.

-----, L. Lloyd, & J. Page

1982 Ratings of sign translucency & gloss concreteness of two grammatical classes of signs, Sign Language Studies 37, 305-343.

Moores, D.

1981 Educating the Deaf: Psychology, Principles & Practices (2nd edn.). Boston: Houghton-Mifflin.

Ornstein, P.

1978 Memory Development in Children. Hillsdale, NJ: Erlbaum Associates.

Page, J.

1985 Relative translucency of ASL signs representing three semantic classes, Journal of Speech Hearing Disorders 50, 241-247.

Riekehof, L.

1978 The Joy of Signing. Springfield, MO: Gospel Publishing House.

Stedt, J. & D. Moores

1989 The etymology of an esoteric sign, Sign Language Studies 29, 371-376.

Stokoe, W., D. Casterline & C. Croneberg

1965 A Dictionary of American Sign Language on Linguistic Principles. Washington: Gallaudet College Press [lst edn. reissued, Linstok Press].

Tieso, J. & R. Story

1981 Memorize Sign Language. Lincoln, NE: Dill Enterprises.

Winer, B.

1962 Statistical Principles in Experimental Design. New York: McGraw-Hill.

BREAKING THROUGH THE CULTURE OF SILENCE

Sherman Wilcox

We were simply talking in our language of signs,

When stormed by anthem-driven soldiers

pitched a fever by the score of their regime.

They cuffed our hands, strangled us with iron reins.

"Follow me! Line up! Now sit!"

The captain, whip in hand, inflicts his sentence with this command:

S peak !

"Sh..?"

Speak!

" ..i..?"

S peak !

" . .t? "

Damn your chains! We'll pronounce our own deliverance

and articulate our message loud and clear.

And for the width of a breathe we grant each other asylum

talking in our language of signs.

When ... they pound, pound, pound.

"Don't answer. Don't open. It's bad, don't!"

The thunder rolls again.

"But I want to. I want to see. Well maybe. I just want to see.

So step by step we succumb our silent agreement, undone.

"Come out of your dark and silent world

and join us in our bright and lovely world."

Look! Those whose ears work are signing.

Yes, but such queer speech they shape.

What waits out there? To be fair we should see more.

Could it be they've rearranged their score?

And one-by-one we go down the corridor of their sterile syntax,

not knowing ...

(excerpt from an untitled poem. Ella Lentz)

My presentation is unabashedly political. The message I want to leave is this: the Deaf community is an oppressed. disempowered minority. One way that power has been withheld from Deaf students is the systematic confounding of their linguistic situation. As a result the development of literacy is both a problem and a solution.

One of the most crippling problems in deaf education today is the pervasiveness of myths surrounding Deaf people, their language, and their lives. These obscuring myths would be mere trifles if they did not have such a powerful influence on Deaf people; these mythical

trivialities can determine the living realities of Deaf students.

Interactionism is the framework I will use to describe the influence of myths on Deaf people's language and learning. It is based on the writings of the Russian psychologist Vygotsky (1962, 1978) as expanded by Vera John-Steiner and her associates (John-Steiner 1985, Elsasser & John-Steiner 1977, John-Steiner & Tatter 1983). The interactionist framework assumes that: (1) language is both a tool for thinking and a tool for communicating (2) the use of language as a communicative tool can and should be studied as social interaction; and (3) language develops and is used in social-historical contexts. The strength of the interactionist approach to literacy is that it encourages us to examine how society and its myths and ideologies -- our "cultural residue" as Paulo Friere (1985) would say -- become internalized by individuals. This internalized residue affects language and the development of literacy. But because language is also a tool for thinking, the critical examination of these myths can become a means to illuminate reality.

An interactionist understanding of literacy in the Deaf community is important for two reasons. First, interactionism readily incorporates the fact that deafness is above all not a pathological problem. Deafness is not a problem that can be "cured" by fixing and filling. Deafness is in essence a cultural problem, one that must be understood in terms of power. The central problems of Deafness and Deaf literacy are locked in the struggle for power; power defined, as Foucault would say, in terms of "who is charged with saying what counts as true knowledge" (1980:131). Second, interactionism stresses that literacy is an effective means of questioning myths. Literacy programs can "challenge the myths of our society" (Holt 1965:8). Literacy is a vehicle for liberation because it promotes critical thinking and empowerment (Giroux 1983).

The radical educator, Henry Giroux, has written that if we are to understand the meaning of liberation we must first be aware of the form that domination takes by examining the historical and cultural particularities of subordinate and oppressed groups. Here I would like to explore a few particularities that shape the consciousness of deaf people: our ideologies surrounding languages perpetuated in our talk about signing, signed languages, and language our understanding of who Deaf people are; our educational practices. All these in a subtle but powerful way withhold knowledge from deaf people. Deaf people are kept

unconscious of their own linguistic situation, and thus they are unable to transform that situation. As Ella puts it in the poem, Deaf people "go down the corridor ... NOT KNOWING."

Deaf children and adults live in a bilingual and trimodal environment. By this I mean that within deaf education and the Deaf community there are three ways of "doing" a language: speaking, writing, and signing; and there are two languages: English (which may be spoken, written, or signed) and American Sign Language (which can be signed only).

The first way in which Deaf people are "mythified" is in understanding the relationship between languages and their perceptible expression. Hearing people dealing with deaf people, perhaps unknowingly, switch logical types; It works this way:

Suppose someone were to walk into a lecture room and start speaking some language that you had never heard before. You might lean over to your neighbor and ask, "What IS that?" Now, imagine that your neighbor discreetly whispers back, "That's speechi" or "That's spoken language." Your laughter demonstrates that something is wrong here. You asked "What is that?" to know what language is being used, and your neighbor has answered as if you were asking what mode is being used -- answered "speech." Languages and the mode of expression of them belong to different logical types mixing types leads to laughter or complete confusion.

Or suppose I were to write some strange characters on the blackboard, you again ask, "What is that?" and your neighbor answers "Written language," or "Writing." Nobody, of course would be so perverse as to answer our questions like this. These answers are not acceptable; we immediately see that they are answers to the wrong question. Yet, it is perfectly acceptable, when asked what a deaf person is doing when she moves her hands to say "Oh, that's sign language."

Our talk (our culturally fixed way of thinking) about signing and signed languages confuses the use of hands, the modality, with a language. Signing is not a language but only a means of producing (utterances of) a language. This is important because in education for the deaf and in the Deaf community there are two languages that are signed -- produced with the

hands: English and American Sign Language, or ASL.

ASL is a visual-gestural language used in the United States and Canada by Deaf people. It is not universal and it is not English; it has its own phonology, morphology, syntax, and semantics. It can only be signed; you can't speak or write ASL. Literature in ASL is necessarily "oral literature," not preserved in a permanent medium like writing but handed down from one signer to another, one generation to another.

What about signing English? If you could see Ella signing her poem on the videotape, a poem that uses both ASL and English, you would be struck by the difference, the tension visible when she uses signed English. When the teacher in the poem beckons, "Come out of your dark and silent world," Ella code-switches to a kind of signed English that she signs in a very mocking, derogatory style.

Unlike ASL, signed English systems are the inventions of educators. Signed English -- or Englishes; there are several systems for encoding English in signs -- was designed for the express purpose of making English visible to deaf students. The several systems of signed English differ in how they answer two basic design questions: first, what level of English are we going to represent (sounds, morphemes, words, suprasegmentals, etc.)? and second, where are we going to get our stock of "signs" (by outright invention or by borrowing from the already existing stock of ASL signs)?

Some systems, notably Cued Speech, have approached the design of signing English by using newly created gestures to represent the sounds (phonemes) of English. They are not widely accepted. The more successful systems of signed English have answered these two questions in a conservative manner. They have chosen to represent by manual signs whole words of English, for the most part, with an occasional inflectional or derivational morpheme thrown in for convenience -- the latter are usually called "sign markers;" and they have borrowed extensively from ASL's stock of lexical items. Thus if one signs READ or WRITE in ASL and in English, it is clear that the same signs are used in both.

These design decisions were made by the creators of signed English systems in order to make their systems more accessible and acceptable to the Deaf community. For example,

Harry Bornstein, one of the originators of "Signed English," states that "most of the signs in Signed English are taken from ASL... We use ASL signs where possible because it should make it somewhat easier for the child to communicate with people who use that language" (Bornstein et al. 1983:4). This is a laudable goal. There is another side to the story, though, because this design decision also confuses Deaf students by obscuring the differences between the languages ASL and English. Many words in signed English end up looking the same as ASL words. Bornstein recognizes the need to warn parents of deaf children about this: "American Sign Language is different from English, so do not be surprised if you have difficulty communicating with those deaf adults who depend exclusively on ASL" (ibid.). My question is, who is warning the deaf students with whom teachers use signed English?

One characteristic of weak writers is that they often approach writing as a translation task, from the spoken word to the written word. Deaf children and adults also seem sometimes to approach writing as translation task -- a translation of signed "word" to written word. This is especially a problem for Deaf literacy because of the relationship between signed words and written words, more specifically between ASL words and English words. The relationship is already skewed because of the design of signed English systems. But there is more.

Unlike English, ASL is a polysynthetic language. Words in ASL are very different from words in English. Words in ASL can be verbs that incorporate subjects and objects within themselves, while presenting also complex adverbial, temporal, and other information. our talk, the talk of those enculturated in hearing cultures, about signed language works to subvert the Deaf student's understanding of this situation. We commonly teach, with a gestural demonstration, "This is how we sign X," inserting at 'X' an English word. We who hear also ask deaf teachers of signs questions about how "to sign" English words, and we expect that because we are asking a question about one word of English, the answer, the ASL equivalent, will be one sign also. The relationship between polysynthetic ASL signs and English written words presents problems for the Deaf writer, as in the following note:

I must know now not postpone postpone postpone... Manager and else new manager woman Fern will not be no any more her manager fired.

The writer seems to have assumed that the multi-morphemic ASL word POSTPONE,

inflected for continuative aspect by being repeated twice, must be written as three instances of the English word. It is also important to examine the signed "equivalent" of a word. Is a signed word only what is on the hands, or is it something more? For example, does the signed word include information from the face, body posture, or other sources?

The second question has to do with the nature of ASL words. They do contain information from other sources than just the hands. The assumption that information in ASL is presented only by the hands is a culturally imposed myth, and it raises a serious barrier to linguistic description. From the research of those like Charlotte Baker-Shenk of the discontinued Linguistics Research Laboratory at Gallaudet College and Scott Liddell in the Linguistics Department of Gallaudet University, linguists now know that ASL words are not solely represented by action of the hands. This also can be a problem for Deaf students who approach the task of writing English as a translation of signed words, which in their conception are represented only on the hands, into written words. For example "question-markers" in ASL are complex configurations of facial and head action. This seems to have been a problem for the Deaf writer in this note:

Sherman--don't forget you bring the picture tomorrow. OK

I am certain that the sign OK would have been signed with an accompanying question-marker (just as one speaks "OK?" with a question inflection). Since our talk about ASL does not recognize that the multi-morphemic ASL words can contain information in locations other than the hands (in this case, on the face), the student neglected to translate the question-marker into her written English.

Many more, and probably more eloquent, examples of this type could be given, but these should make the point; and now the reader may wonder, "what does all this have to do with the culture of silence?"

Freire has said that

...in the culture of silence the masses are mute... They are prohibited from taking part in the transformations of their society and therefore prohibited from being. Even if they can

occasionally read and write because they were "taught" in humanitarian -- but not humanist -- literacy campaigns, they are nevertheless alienated from the power responsible for their silence. (1985:50)

We think of Deaf students as "disabled," but this is true only if we realize that the source of the disablement is not within the students. It is not the pathology of their deafness. Deaf students are rendered unable or disabled by their interactions and struggles with the more powerful Hearing educational establishment and by the myths that I have described briefly here, myths that are perpetuated in our educational methods, our talk about signing, and our understanding of the Deaf cultural situation. Deaf students, like the minority students that Cummins describes (1986), are differentially disabled or empowered by their school experience.

Far too often Deaf people are surrounded by a culture of silence -- not the silence of not being able to hear or speak but the silence of not being heard, of not having a "voice." Again, in the words of Henry Giroux, "to be voiceless in a society is to be powerless. Literacy skills can be emancipatory only to the degree that they give people the critical tools to awaken and liberate themselves from their often mystified and distorted view of the world" (1983:228). How then can we break through the culture of silence? How can Deaf people's deafness become the source of their own empowerment?

One way is to enlighten Deaf students about the true nature of their linguistic situation. This doesn't mean that Deaf students need to become linguists. It does mean that increased metalinguistic awareness can provide distance from a "mystified and distorted view of the world." By objectifying their world, Deaf students can begin to know it and question it in a critical way. We can begin by teaching Deaf students about signed, spoken, and written modes and about the differences between ASL and English (differences often obscured by word-sign), and about the true complexity of the bilingual, trimodal task they face.

We have the testimony of Deaf persons themselves that this way does enlighten. Mervin Garretson in his Foreword to Sign Language and the Deaf Community writes, "To know, once and for all, that our "primitive" and "ideographic gestures" are really a formal language on par with all other languages of the world is a step towards pride and liberation" (Baker &

Battison 1980:vi). Barbara Kannapell writes, in the same volume: "Once I learned that ASL is my native language, I developed a strong sense of identity as a deaf person and a more positive self-image" (op. cit. 112).

Another way to start chipping away at the culture of silence is by exploring Deaf culture's own "generative themes" in literacy programs. I have seen the beginnings of many "generative themes" when Deaf people tell stories about something that happened to them, in which the moral of the story is that Deaf people must be careful to rely on their eyes. The eyes and vision play a critical and hitherto unexplored role in Deaf culture. To explore this, Deaf students in school may be asked to write on the importance of eyes. Here is an example from an assignment I gave a deaf student in a public high school. He called it, "How to skill eye with the Deaf."

The paragraph is about ear as not hear with deaf. When I was little boy I usually used my eyes for driving carefully. I walked across the street and the car honked me. I can't hear it. The other story about is bike. My brother teach me to how ride bike then I learn to ride it. Then when the car arrived near my home it hit almost me. I ride on the street the car was horn to me. Please moved side street. The car horn many again to me. The woman said Please moved by side street. I told I am Deaf. The woman said oh I see but you need you eye look car. I feel better eye look car. I said no problem.

I don't believe any of these activities will alone bring improved literacy skills for Deaf students. The first crack in the Deaf community's culture of silence will not come from outside activity. These activities will, however, result in a more active, more critical consciousness on the part of Deaf students. And this in turn will empower Deaf students, allowing them, in Henry Giroux's words, to "produce, reinvent, and create the ideological and material tools they need to break through the myths and structures that prevent them from transforming an oppressive social reality" (1983:226).

The culture of silence must be broken from within, and the first blow must come from the Deaf student. As Nan Elsasser and Vera John-Steiner have noted: "A student's sense of personal power and control emerges largely as a result of the increasing movement of his or her social group towards self-determination. In the absence of such movement educational

intervention is most often futile" 1977:56f). Or, as Ella Lentz so eloquently expresses it: "Damn your chains! We'll pronounce our OWN deliverance and articulate OUR message loud and clear."

Notes

1. Transcription by the author of a videotaped performance of the poem.

2. Videotape technology now offers a way to preserve the oral literature of ASL in a permanent record.

3. The poem by E Mae Lentz is contained in a series of four half-hour videotapes entitled "Deaf Culture" distributed by the San Francisco Public Library.

References

Baker, C. & R. Battison (eds.)

1980 Sign Language & the Deaf Community: Essays in Honor of William C. Stokoe. Silver Spring, MD: National Association of the Deaf. vi & 112.

Bornstein, H., K. Saulnier & L. Hamilton

1983 The Comprehensive Signed English Dictionary. Washington: Gallaudet College Press.

Cummins, J.

1986 Empowering minority students: A framework for intervention, Harvard Educational

Preview 56, 18-36.

Elsasser, N. & V. John-Steiner

1977 An interactionist approach to advancing literacy, Harvard Educational Review 47, 355-369.

Foucault, M.

1980 Power/Knowledge. New York: Pantheon Books.

Freire, P.

1985 The Politics of Education: Culture, Power ~ Liberation. South Hadley, MA: Bergin & Garvey.

Giroux, H.

1983 Theory & Persistence in Education: A Pedagogy for the Opposition. South Hadley, MA: Bergin & Garvey.

1985 Introduction to Freire, above.

Holt, L. (ed.)

1969 The Summer that Didn't End. New York: Macmillan.

John-Steiner, V.

1985 The road to competence in an alien land: A Vygotskian perspective on bilingualism. In Culture, Communication & Cognition, Wertsch ed. New York: Cambridge University Press.

----, & P. Tatter

1983 An interactionist model of language acquisition. In The Sociogenesis of Language & Human Conduct, Bain ed. New York: Plenum Press.

Vygotsky, L.

1962 Thought & Language. Cambridge, MA: MIT Press.

1978 Mind in Society. Cambridge. MA: MIT Press

DUALITY OF PATTERNING: RESPONDING TO ARMSTRONG & STOKOE

Edwin G. Pulleyblank

In response to the comments of Armstrong and Stokoe on "The Meaning of Duality of Patterning & Its Importance in Language Evolution" (Sign Language Studies 51), it is evident that I have not succeeded in making clear, at least to my two critics, the fundamental difference that I see between the inherent duality of patterning found in a11 human spoken languages and such organizational principles as can be discerned in other symbolic systems that, in my view, lack this characteristic. I should like to comment briefly on one or two of the points that were raised:

Armstrong defines the problem of demonstrating that a communication system, say a signed language, has the property of duality" as requiring, firstly, "selection by signers of a relatively small number of the handshapes, facial expressions, etc. that could constitute minimally contrasting pairs. This stock of elements should be relatively fixed (i.e. introduction of new elements should be gradual)" (SLS 51, 122f). I do not know quite what is meant by "relatively" here. I would venture to say that, in principle, at any one synchronic stage, the phonemic inventory of a spoken language is, quite simply, fixed. In practice slippage does occur. Speech communities are never completely uniform, and the clashes that this produces can interfere with the phonological systems of individual speakers. The passing of the phonological system from one generation to the next is another constantly recurring source of potential variation. The most common type of language change involves, however, not the addition of phonemic elements but the loss of distinctions through mergers; e.g. the loss of distinction between wh and w, which has already affected major dialects of English and will no doubt spread to the rest of the language community eventually -- or the merger of syllabic [n] with syllabic [m,], which has occurred quite recently in Cantonese as

spoken in Hong Kong. Change in pronunciation of a phoneme in a specific environment may also occur without loss of distinction, as when [k] became palatalized to [t|] before high front vowels in words like child in Old English. Such changes may eventually lead to the splitting off of a new phoneme from an old.

Simple addition of new phonemes, as opposed to the splitting of old ones through conditioned sound change, is not "relatively gradual" but very rare and exceptional. In his remarks on Armstrong's 1983 paper, Hewes claimed that a language can add to its stock of phonemes through borrowing, but as I showed with reference to the example he cited from Middle English, even the possibility of this is severely circumscribed by the need to fit the new item into the existing phonological system. This is because phonemes, however few in number they may be in a given language, are not simply a "stock of elements," each more or less independent of the other, but a highly integrated system based on combining an even smaller number of distinctive features according to rigid rules. Thus, the sound [ts] in English is a combination of two phonemes, which can occur at the end of a word but not at the beginning. In many other languages (e.g. German, Russian, Italian, and Chinese) it is a single phoneme. Native speakers of English can quite easily learn to make this sound. Nevertheless, when words are borrowed from these languages into English, the stock of English phonemes is not enriched. Instead the foreign affricate is deformed. Tsar is pronounced [zar]. The local place name Tsawwassen, near Vancouver, is pronounced with initial [t], not [ts]. In Japanese the situation is even more complicated. The sound [ts] is neither a phoneme nor cluster of two phonemes. It is the allophone of the phoneme /t/ before the vowel /u/. Hence, the English word tool becomes tsuru when borrowed into Japanese.

Armstrong makes a point of the fact that in face-to-face communication one can introduce audible non-speech signals; e.g. a lip buzz resembling the sound of breaking wind, and even include it in a sentence of the form "He went ****." In face-to-face communication one could equally well replace the asterisks in such a sentence with a visual obscene gesture. Neither the noise nor the hand signal can, however, be combined freely with ordinary words as nouns or verbs in a sentence. In this they resemble interjections, like sh, which consists of an ordinary English phoneme /~/ used outside the regular rules of English syllable formation. As I remarked in my 1983 article, one can turn sh (but hardly a lip buzz or a hand gesture) into a verb by repeating it with a shwa vowel between, so that it becomes shush

("He shushed me"), and one can make it even more conformable to ordinary English phonology by dissimilating the first consonant, giving hush. Communicatively these changes contribute nothing. As single utterances, sh, shush, and hush are equivalent. Where they differ is in their capacity to be freely combined syntactically with other morphemes.

I do not understand Armstrong's suggestion that the principle of regularity in phonetic change "may have its basis in trends towards conventions and stylistics in culture generally." The conservatism of the behavioral system that he mentions -- dress, table manners, gender related behavior -- is undoubtedly based on the fact that the traits that are preserved are charged with symbolic meaning. The point about phonetic change is that, just because they have no direct symbolic meaning in themselves, the phonemes can change, while the morphemes, which do carry symbolic meaning, retain their identity. Moreover, when phonemes do change, the same phoneme changes in the same way in the same phonetic context, regardless of the meaning of the morpheme to which it is attached. Latin caballus becomes French cheval just as castellum becomes chateau and cattus becomes chat.

Stokoe refutes my claim that the "cheremes" of ASL do not form a closed system that can be combined according to definite rules with or without a meaning attached, by citing examples of "word-play" in which signers indulge for the amusement of themselves and others. From his description I am left in some doubt as to whether this is really comparable to the capacity of a spoken language to create nonsense words which conform to its phonological rules. He observes that "in such sign games the normal movements of the signing hands often become straight line movements, following the three orthogonal directions of space, and the normal postures of the arms are exaggeratedly spastic or athetoid." This seems to me more comparable to a comedian pretending to talk a foreign language by making random sounds that sound vaguely like speech than to the nonsense verse of Edmund Lear or Lewis Carroll, in which new words like 'borogroves' or 'snark' are created that, phonologically speaking, are perfectly normal unexaggerated English, but just don't happen to have had a meaning attached. Another kind of word play that is readily available to speech, just because phonology has its own definite rule system, is the creation of "secret languages" such as pig Latin. I should be interested to learn if there is anything comparable in ASL.

Why does this matter? If subjecting one's visual or audible signs to a strictly limited, rule

governed code does not improve face-to-face communication, why did it ever come about? Compression and simplification of mimetic signs, to which Armstrong refers, has an obvious advantage in enabling signing to proceed more rapidly. It has even been suggested by Lieberman that the selective advantage in the evolution of the vocal system for the production of vowel sounds was primarily one of speed and clarity in vocalization (1983). There must, however, be more to it than that. It is not at all obvious how the advantages to be gained by abbreviating and conventionalizing an existing set of signs so that they can be made more rapidly should inhibit one from incorporating new signs that are either unabbreviated or abbreviated in different ways and, indeed, it seems to be the case that the manual sign systems, unlike phonologies, are under not such inhibition. The ability to sign or speak rapidly is obviously advantageous, but halting speakers can be skillful users of language in other ways, such as thinking, a function of language that has surely been as important as communication in human cultural evolution.

It is my claim that, while the initial advantage of imposing overall phonological patterning on vocalization may, as Lieberman suggests, have been in terms of speed and clarity, the emergent advantage that strict duality of patterning (not partial or relative duality of patterning) brought with it has to be sought in quite another direction; i.e. in the unlimited productivity with which it endows language, by providing a code book made up of a strictly limited set of elementary units that can be combined into larger units, to which meanings can be attached and which can then be manipulated to form sentences and larger units of discourse according to definite rules. The process by which meanings get attached may be, and no doubt usually is, motivated in one way or another -- by sound symbolism or by association with an already existing morpheme or by metaphorical extension of an existing meaning, or, very often, by combining existing morphemes in a new way. The point is that once this process has taken place, the original motivation ceases to be relevant. The connection between sound and sense has become arbitrary as far as the manipulation of the word in the language is concerned.

The advantages of a code book that offers a rigidly restricted set of terms to which meanings can be arbitrarily attached can be illustrated by the kind of four-digit telegraphic code that is used to transmit Chinese characters, or by business firms and governments to transmit messages. The expressions "0000" to "9999" provide ten thousand terms that can be used to

make up a code book to suit the needs of any kind of user. One advantage of such a code is that messages can be enciphered by adding to the coded message a random string of numbers that must then be subtracted by the recipient before he can decode the message. Whether one wishes to use such a code en clair or enciphered by an additive, what one cannot do is intersperse other symbols with the digits or use code words that consist of more or fewer than four digits.

An even apter analogy is ready to hand in the digital computer, which by using the binary arithmetic of '+' and '-' or '1' and '0' to encode anything one wishes to encode is revolutionizing our lives in incalculable ways at the present time. It is my contention that the advantage, for cognition even more than for communication, conferred by the phonological systems of spoken languages (based like the computer on strictly binary combinations of distinctive features) provide just such code books. The evolutionary advance by which the sound producing capabilities of the human vocal tract, and at the same time the human brain, were adapted to this is not the whole story of the evolution of language but is certainly one of the most important steps in that evolution, to which all of us, both hearing and deaf, are heirs.

References

Armstrong, D.

1983 Arbitrariness, iconicity & duality of patterning in signed & spoken languages (with comments by G. Hewes, C. Peters & W. Stokoe and a reply by the author), Sign Language Studies 38, 51-83.

de Gro1ier, E. (ed.)

1983 Glossogenetics: The Origin & Evolution of Language. Chur: Harwood.

Lieberman, P. 1983 In de Gro1ier, 91-114.

Pulleyblank, E. 1983 In de Gro1ier, 369-410.

ON BOROGROVES & CODE BOOKS

William C. Stokoe

Professor Pulleyblank's contribution here to the ongoing search for ways that language may have evolved and phenomena from which it evolved is most welcome. And as my comments in SLS 51 have left him in some doubt, I would like to comment further.

The issue as he states it is clear: Do the "cheremes" of ASL -- or its "phonemes," if the structure and not the material of phonology is meant -- "form a closed system?" My brief description of one form of ASL word play in the earlier issue has not convinced him, instead left the impression that such ASL games more closely resemble the faking of a foreign language by (hardly) random sounds than they resemble "the nonsense verse of Edmund Lear or Lewis Carroll."

I am not at all sure that the kind of signing I have in mind, signing I have seen ASL signers doing for fun, and the kind -- or kinds -- of spoken language play Pulleyblank has in mind can really be brought before a reader for comparison; each is part of the experiences of a different person. One reason, however, I am convinced that ASL has a closed system, either of "phonemes" or distinctive features or both, is that ASL signers immediately know if a newly met person signing with them is a "native signer" of ASL, and if so, whether from their own dialect area or another; if not, perhaps a learner or a foreigner with some knowledge of ASL signs; and if a hearing person, they may even be able to distinguish a professional (teacher or interpreter) from a child of deaf parents (Nash & Nash 1978, SLS 20). Knowing all this is possible because the newly met signer's behavior either sticks to the closed system of (manual and nonmanual) ASL sign production features, or exhibits dialectal or other variation, violating the system with omissions and intrusions.

Another point calls for comment because it is so often raised in discussions of spoken vs. signed languages. Pulleyblank writes of "the capacity of a spoken language to create nonsense words which conform to its phonological rules," and cites the nonsense verse of Lear and Carroll. In this context we need to remember that it is not spoken language that utters nonsense words, nor does spoken language compose masterpieces of nonsense verse. Because I have witnessed serious and humorous performances in ASL by such artists as Bernard Bragg and Ella May Lentz and Mary Beth Miller, I have no doubt that among the ASL linguistic community's signers there are creators of light and serious verse comparable to a Lear or a Landor, but it is worth emphasizing that such verbal art is created by unique individuals, whatever language they use as medium. No one who sees gifted ASL poets in performance imagines that the silent medium has impoverished the artist -- quite the reverse.

Nonsense words, on the other hand may be unconscious creations of uninhibited speakers; e.g. my daughter before the age of three referred to a venerable black locust tree in her grandparents' front lawn as "the mercament tree" (spelling my own), and so it and other black locusts have often been designated ever since in our family. Pulleyblank and others will find in descriptions of young deaf children's signing, much of it reported in these pages, many instances of unconventional use by youngsters of the conventional elements of sign formation. Klima and Bellugi in SLS 8 (1975) and in The Signs of Language (1979) describe not only verbal wit and humor but "slips of the tongue" in sign language that occur

precisely because the wiring of the rules gets twisted.

The creation of nonsense verse for publication, however, and the potential generation of meaningless "words" by the phonology and morphology of a language are quite different logical types. The former requires a speaker's or signer's deliberate use of the possibilities language and culture provide; the latter occurs when the operation is performed of combining and permuting the elements of an abstract system. Confusion of logical types does not help in the search of the paths of language evolution.

As for exact parallels in ASL to "pig Latin," I know of none -- in fact, to suppose that a signed language and a spoken language extend parallels to infinity is once again to confuse logical types, if not sensory systems. Signers can communicate cryptically, however, using, in a sense, "secret language," not by meaningless accretions (e.g. igPay atinLay, or Pagig Lagatagin), but by drastic deletion: their "secret" or surreptitious sign messages are transmitted by curtailing the muscular contractions needed to position the arms, to form the handshapes, to act with them, or to produce a facial change -- to the degree that they become all but invisible to one not fluent in signing. Just as one who knows English can decipher isthay, one who knows ASL can read the message in mere suggestions of the necessary actions. (Of course, if anyone can see something, it is visible; but in every culture there are minuscule changes that mean everything and others that mean nothing; naturally the users of signed languages find highly visible things that those attuned to speech ignore -- don't and so can't see.)

Another point Pulleyblank addresses is whether any language's system of elements or distinctive features is closed in any absolute sense. His discussion of phonology, especially from language to language, is enlightening. Once he has told us that a Japanese speaker may say tsuru for "tool," we realize that we must be making the same kind of adjustment many times a second in conversing with a foreigner who knows English but uses elements from another language in pronouncing "our" words.

Here it seems Armstrong's point is worth re-examining: "conventions and stylistics in culture generally" determine, for instance, whether Japanese immigrants in the United States will keep the [ts] allophone of /t/ before /uw/ for a longer or shorter period; and may predict

whether some hypothetical mix of Japanese and English speakers will eventually work a change in the phonology of one or the other language, or perhaps produce a pidgin. Pulleyblank is quite right, of course: it is not the treatment of one phoneme or allophone but the system as a whole that should interest linguists. Nevertheless, cultural changes, like that from Imperial Rome to life in the post-imperial outposts, cause the shift in whole sound patterns. It seems certain that a few Japanese or Russian speakers in a monolingual English speaking U.S. environment (supposing one could now be found) most probably will not suffice to introduce a [ts] allophone or /ts/ phoneme into English; and a few English speakers in Russia or Japan for a long time are pretty sure to spring some leaks in the closed system of their English. The proportion of deaf signers to hearing speakers in a community is a cultural variable that must be taken into account whenever signed and spoken languages are compared. Despite claims that "everyone here spoke sign language (see SLS 53, 381-390), not even in the "deafest" communities have the signing, hearing companions of the deaf signers ever given up their speech. But deaf people interacting with other deaf people who do not share the same sign language show no evidence of an "open" or unrestricted or unsystematic phonology. Instead, as Battison and Jordan (1976, SLS 10) have shown, signers of one language on encountering signers of another stop using the elements of their language according to its rules, and both parties use instead broadly understood gestures and pantomime to communicate.

Though I will give Armstrong an opportunity to reply for himself, I would like to comment also on the paragraph that begins at the bottom of page 166. Pulleyblank sees the compression and simplification of mimetic signs as means of making communication more rapid; and so it does. But Lieberman's point, more fully treated in the seventh chapter of his 1975 book, is not that any little gain in transmission time is a good thing. Instead he is dealing with quanta. There is variability in speaking rates, and Pulleyblank's "halting speakers" may indeed be effective thinkers or communicators, but above or below a certain rate, language transmission becomes unintelligible. The words of a signed language must move arms and hands and so take more time than words made of phonemes, but arms, hands, faces, and eyes can work and vision comprehend them in parallel thus comparable propositions in signed and spoken discourse may occupy equal time. I take the implication of Lieberman's studies to be just opposite of Pulleyblank's interpretation: evolutionary changes in the primate vocal tract were needed so that vocal-auditory coding could catch up

to gestural-visual.

There are slow and fast talkers and slow and fast signers, but language is a code with definite rate requirements. Because of the vast amount of cognitive processing of the signals, their structure, and their meaning content, true linguistic encoding has upper and lower rate limits. With Lieberman, I believe that no invented code comes near the rate of language, signed or spoken. The four- or five-digit code Pulleyblank uses in his argument can be extremely useful for getting messages through difficult and even hostile conditions, but the more safeguards they provide, the more time encoding (and encrypting when used) and decoding will take. Whatever else happened as hominids appeared in the animal kingdom, the evolution of language required a quantum increase in the rate of signifying and communicating; i.e. in amount of information processed per unit time.

The analogy Pulleyblank draws between the duality of patterning and the digital computer is apt enough, but for me it serves only to prove that, in "Mind and nature: a necessary unity" (Bateson 1979), fundamental principles are inherent. Or to turn to history from epistemology, the development of computer logic based in the binary contrasts '+/- and 1/0' and the description of binary features (e.g. Jakobson et al. 1952) are part of the same cultural pattern, a prominent feature of which is the algebra of Boole (1815-1864). There is nothing in the nature of gesturally based language, nor in the physiology of vision, that precludes the selection of certain actions/perceptions to constitute the meaningless features out of which meaningful symbols are constructed and in fact, the behavior of ASL signers continues to convince me that they have no difficulty at all in recognizing what is and is not part of their code.

In Pulleyblank's code book example, '3476 0023' might well be used to transmit a two word sentence, while '34076 023' would be an outright error, "ungrammatical." It is becoming more and more evident in recent research that a deaf signer recognizes a certain constellation of arm, hand, and facial features as forming a symbol of language, and, moreover, just as instantly recognizes other such constellations as similar but erroneous.

References

Bateson, G.

1980   Mind & Nature: A Necessary Unity. New York: E. P. Dutton.

Jakobson, R., G. Fant & M. Halle

1952 Preliminaries to Speech Analysis. Cambridge, MA: MIT Press.

Klima, E. & U. Bellugi

1975   Wit & poetry in American Sign Language, Sign Language Studies 8, 203-224.

1979   The Signs of Language. Cambridge, MA: Harvard University Press.

Lieberman, P.

1975 On the Origins of Language. New York: Macmillan.