SECTION I: THEORETICAL ISSUES

1 *Language varieties in the deaf population and their acquisition by children and adults*

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Editor's introduction

In this chapter, Bochner and Albertini take on the ambitious task of reviewing the central issues in the acquisition of language by deaf individuals in North America. They adopt a self-described "sociolinguistic" perspective by viewing language acquisition by the deaf as occurring under conditions of restricted intake that result in learning patterns resembling those of pidgin and creole speakers.

In order to explore this analogy in depth, the authors first provide an overview of research on the "products" or linguistic output of deaf learners, including written and spoken English, manual English, Pidgin Sign English (PSE), and American Sign Language (ASL). They then consider various aspects of the acquisition process, particularly those related to the interplay between the organism and the environment, the relationship between communication channel and the mind, and the influence of age on intake.

Apart from the thoroughness with which Bochner and Albertini treat their topic, what makes this chapter an important contribution to applied linguistics is their insights on the relationship between language acquisition among the Deaf and among other speech communities and the implications they draw from the linguistic evidence for the education of deaf children. The importance of primary language acquisition (whether ASL or signed or spoken English) and of the quality of language input/intake for educational advancement is lent an added urgency by the evidence and arguments put forward by these authors.

Language acquisition research with deaf persons over the past 20 years may be characterized as a search for an appropriate metaphor. Some in the United States view instruction in English as remediation to ameliorate the effects of a pathological condition. Others see it as providing students from a subculture access to the academic and employment mainstream. For many adult deaf students, it is sometimes viewed as instruction in a second language, despite the fact that English is their first language.

In this chapter, a sociolinguistic metaphor is suggested: The acquisition of spoken and signed languages most often occurs under conditions of restricted intake, and deaf learners of English, American Sign Language (ASL), or other varieties of signing behave in much the same way as speakers of pidgins and creoles.

The practice of applying sociological terms such as *culture* and *ethnic group* to deaf people is hardly new. At a conference on the social aspects of deafness at Gallaudet College in 1982, Joshua Fishman praised the borrowing of concepts and hypotheses from the social sciences to describe the socialization of the deaf child. At the same time, he warned that metaphors, while usually enlightening, are also somewhat misleading. However instructive, metaphors have their limitations. Mindful of Fishman's warning and cognizant of the limitations of our chosen metaphor, we apply the constructs of pidginization and creolization to the process of language acquisition in deaf individuals much as they have been used recently to describe acquisition by a variety of hearing populations (Andersen, 1983b).

Any overview of language learning in the deaf population must take into account at least three languages or varieties (English, American Sign Language, and Pidgin Sign English), two sensory modalities (audition and vision), and three types of signals (speech, sign, and print). Our task is twofold: first, to conceptualize the range and diversity of language varieties used by deaf children and adults (the products); and, second, to explain how and why these varieties might be acquired (the process). For both parts of the task, the constructs derived from the field of sociolinguistics appear to be useful tools. First, great diversity in language use and form is the rule in communities where pidgins and creoles have evolved. Second, researchers in child language and second language learning have repeatedly noted parallels to the processes of pidginization and creolization.

In this chapter, we have kept discussion of the diverse products of acquisition to a minimum. We focus mainly on the process of acquisition. The interaction between the organism and the environment, the relationship between the communication channel and the mind, and issues related to age, intake, and attainment are discussed in some depth. This discussion holds implications for the instruction of deaf students and for future research. Some of these implications are discussed in the concluding section of the chapter, where it is suggested that acquisition research with deaf students, rather than being tangential, has much to offer mainstream research in language acquisition.

The products of acquisition

We begin with a brief description of the language varieties used by members of the deaf population. These include various manifestations

of English (e.g., spoken and written) and of manual languages (e.g., Pidgin Sign English and American Sign Language).

English

READING

Reading achievement tests standardized on normally-hearing students are routinely considered indirect estimates of the English skills of hearing-impaired individuals since English language proficiency is a necessary prerequisite for reading comprehension. The results of numerous studies have consistently demonstrated that the reading comprehension skills of hearing-impaired students are considerably lower than those of normally-hearing children of comparable age, with about half of the population of deaf 18-year-olds reading at or below a fourth grade level and only about 10% reading above the eighth grade level (Conrad, 1977; DiFrancesca, 1972; Gallaudet Research Institute, 1985; Trybus and Karchmer, 1977). On the average, the reading achievement of hearing-impaired students tends to increase at a rate of less than 0.3 grade equivalents per year (Trybus and Karchmer, 1977).

Although proficiency in the English language is necessary for reading comprehension, it is not sufficient since comprehension may vary as a function of extralinguistic factors, such as the reader's familiarity with the subject matter of the text. Consistent with reports from adult second language acquisition, English language proficiency and reading comprehension have been found to correlate at approximately .70 in deaf young adults (Albertini et al., 1986; Bochner, Meath-Lang, and Lichtenstein, personal communication); these results indicate that reading comprehension and English proficiency are distinct but related skills. Similarly, other research indicates that deaf students do not possess English language abilities comparable to those of younger normally-hearing children with equivalent reading achievement (Moores, 1970).

WRITING

The writing of deaf individuals has been compared to that of normally-hearing controls in numerous studies, which have consistently revealed differences in performance indicative of deaf subjects' English language deficiencies. Sentences written by deaf children and adolescents tend to be shorter (i.e., contain fewer words) than those written by normally-hearing controls of the same age and contain fewer conjoined and subordinate clauses (Heider and Heider, 1940; Myklebust, 1964). Deaf individuals also tend to reiterate words and phrases within a discourse (Heider and Heider, 1940; Myklebust, 1964; Simmons, 1962) and use more articles and nouns and fewer adverbs and conjunctions than

normally-hearing children matched for age (Myklebust, 1964; Simmons, 1962). With increasing age, however, the length of their sentences and compositions tends to increase, as does the diversity of their word usage (Stuckless and Marks, 1966).

Grammatical errors frequently appear in the writing of deaf children and youth, their number decreasing slightly as age increases (Stuckless and Marks, 1966). Among the most common errors that these individuals make is the recurrent use of patterns that do not correspond with the inflectional morphology (e.g., in verb tense and agreement), the misuse of function words (e.g., articles and prepositions), and various other errors (e.g., incorrect subcategorizations, inappropriate use of coordinating and subordinating conjunctions, and/or anomalies in constituent structure). (See Greenberg and Withers, 1965, for numerous examples of the types of grammatical errors appearing in the writing of deaf individuals.) Some of these errors are related to the fact that, traditionally, deaf children have been taught written language sentence by sentence and not in discourse form (Kretschmer and Kretschmer, 1978; Wilbur, 1977).

GRAMMAR

In the past two decades, a number of studies have examined the status of various syntactic structures in the English of deaf children, adolescents, and young adults, focusing attention on the nature of errors in comprehension, production, and acquisition. The results of such studies help to characterize the linguistic competence of hearing-impaired individuals. In addition, they provide a foundation for the study of acquisition by demonstrating the degree to which various constructions have been acquired and by yielding descriptive information about aspects of the structure and processing of language.

The results of numerous studies involving a diverse array of sentence structures, subjects, and experimental procedures have shown that function words and morphology pose considerable difficulty for hearing-impaired children and adults. These components of grammar, which are readily acquired by normally-hearing children as well as by adult second language learners, constitute major obstacles to the successful acquisition of English and attainment of proficiency in the hearing-impaired population. Articles, prepositions, conjunctions, pronouns, verbal auxiliaries, and inflectional and derivational suffixes are among the most persistent and pervasive sources of error observed in their spoken and written English and on experimental tasks (Bochner, 1982; Quigley and Paul, 1984). The difficulty hearing-impaired individuals experience with function words and morphology can be seen in the way they process and acquire a variety of English syntactic structures; this difficulty persists in the adult population despite years of formal instruction. In simple, active, declarative sentences, errors in function words and mor-

phology indicate faulty choice or interpretation of grammatical markers. In multiple-clause, interrogative, and passive sentences, however, the errors often seem to involve anomalous structural configurations or overgeneralized processing strategies (Albertini and Samar, 1983; Bochner, 1978, 1982).

The problems deaf individuals encounter with passive, interrogative, and relative clause sentences, for example, are clearly associated with difficulties pertaining to the use of verbal auxiliaries, participles, prepositions, and relative pronouns. Passive sentences frequently are interpreted as active and produced with errors in the auxiliary *be,* the preposition *by,* and/or the passive participle *-en* (Power and Quigley, 1973; Tervoort, 1970). The insertion of *do* and inversion of subject and auxiliary tend to be major sources of difficulty with interrogatives (Quigley, Wilbur, and Montanelli, 1974). With regard to relative and other subordinate clause constructions, the function words that characterize them are frequently used inappropriately, and subordinate clauses tend to be treated as or confused with coordinate constructions (Bochner, 1978, 1982). These examples illustrate how errors in function words and morphology are manifested in various constructions, but they do not indicate the cause of these errors.

Constructions that include strings deviating from the canonical subject-verb-object (agent-action-patient or noun-verb-noun) word order are especially difficult for hearing-impaired individuals to comprehend and produce correctly and reliably. This difficulty is evident in various types of embedded and subordinate clause environments, especially in those containing discontinuous constituents where a subject noun phrase does not immediately precede the verb with which it is associated (Albertini and Forman, 1985; Berent, 1983; Bochner, 1978, 1982; Quigley and Paul, 1984). Similarly, this difficulty is manifested in simple sentences containing alterations in underlying SVO word order, specifically in the interpretation of passive and production of interrogative sentences, as noted earlier. One explanation for this behavior may be a preference for arranging English phrases and clauses in a linear-sequential manner, and this preference may in turn stem from tendencies toward parataxis and the simple concatenation of elements without specifying hierarchical relationships among them (Bochner, 1978, 1982; also see Bickerton, 1981 and Givón, 1979). Again, it is noted in passing that traditional instructional practices may have unintentionally limited hearing-impaired students' exposure to complex sentences (Kretschmer and Kretschmer, 1978).

SPOKEN LANGUAGE

The oral language of hearing-impaired individuals has been compared to that of normally-hearing controls in various studies. Results of these

studies indicate that hearing-impaired children tend to utter fewer words and shorter sentences and commit more errors than controls of the same age or younger (Brannon, 1966, 1968; Brannon and Murray, 1966; Elliott, Hirsh, and Simmons, 1967; Simmons, 1962). The fact that their spoken utterances tend to consist primarily of nouns and verbs, suggests that function words are used sparingly (Brannon, 1966, 1968; Elliott et al., 1967; Goda, 1964); in addition, their spoken utterances appear to contain fewer total words per sentence than their written counterparts (Goda, 1959). In general, the performance of deaf children on oral language production and comprehension tasks tends to improve rather slowly as a function of age (Pressnell, 1973).

ENGLISH-BASED (AUXILIARY) MANUAL SYSTEMS

Prior to 1960, little descriptive or comparative work was done on the educational use of manual communication owing to the predominance of oral methods of instruction (Moores, 1978). Since then, however, interest in the use of signing and fingerspelling in educational settings and discussion of it in the literature have increased dramatically. Today, any discussion of modes of English used in educational settings must include English-based systems of manual communication, specifically fingerspelling (Visible English, as used in the Rochester Method), and the auxiliary sign systems known as Seeing Essential English (SEE 1), Signing Exact English (SEE 2), and the Gallaudet Preschool Signed English System (see Caccamise, Brewer, and Meath-Lang, 1983). Another major system, which deserves mention but lies outside the scope of the present overview, is the Paget-Gorman Systematic Sign (PGSS) developed and used in Great Britain (Paget and Gorman, 1971; Wilbur, 1979). These forms of manual communication are treated here as auxiliary languages in the sense that they are contrived (artificial) codes purposely invented to serve specific communicative and educational functions (see McQuown, 1950; Sapir, 1931).

Since several comprehensive descriptions of these systems are available in the literature (see, for example, Caccamise and Newell, 1984; Wilbur, 1979), the discussion here is limited to common goals and characteristics of the auxiliary systems and to the psycholinguistic and pedagogical issues surrounding their use. All of these systems were invented to provide students and teachers with visible, manual equivalents of English words and affixes (Caccamise and Newell, 1984). The most literal representation of English in these systems is provided by fingerspelling, which, in the context of the Rochester Method, is seen as an adjunct to oral educational procedures (Scouten, 1963, 1967).

Inventors of the auxiliary sign systems have generally justified their choice of signs by appealing to spoken and written English. Decisions in each system are based on the pronunciation and meaning of the

English word as well as its spelling (Caccamise and Newell, 1984). For example, inventors of SEE 2 adhere to a "two-of-three rule" that states that if two of three parameters (spelling, pronunciation, and meaning) are the same for a pair of English words, then the same sign will be used to represent those words. Thus, the same sign is used in SEE 2 for *right* (meaning *correct*) and *right* (meaning *privilege*) but not for *write*. What such a rule does is create sign homonyms, and although it is expedient for the inventors of a system, it seems unwarranted and unnecessary. It is unwarranted because homonyms may, in fact, make comprehension more difficult and unnecessary since there may already be attested separate forms (as there are for *correct* and *privilege* in ASL).

The primary issue regarding the use of fingerspelling or an auxiliary sign system is, of course, whether or not its use promotes the learning of English. Given that speech, when processed by audition and/or lipreading, is usually an insufficient source of input and that deaf children rely to a great extent on the visual processing of information, one must scrutinize not only the integrity of each system's representation of English, but also the degree of synchrony between speech and manual representations (since many educational programs use speech simultaneously with signs and/or fingerspelling) and the manner in which parents, teachers, and others employ the system as a source of linguistic input in language acquisition.

Few proponents of auxiliary manual systems claim that such systems are "complete" representations of English. Some (e.g., Hsu, 1978, 1979) come perilously close, however. Hsu states that fingerspelling encodes the same information as "vocal articulation" (1979, p. 30). Since fingerspelling is a representation of orthography, the assumption that it is equivalent to speech and somehow encodes more information than print is unwarranted. However, it must be noted that as an educational methodology, the Rochester Method employs fingerspelling as an adjunct to speech, making it an oral multisensory approach (Scouten, 1963, 1967).

With regard to synchrony, Bellugi and Fischer (1972) found that nearly twice as many words as signs were used by their subjects to relate spoken and signed versions of the same story. This would suggest that a one-to-one, word-to-sign representation would require extremely rapid signing, a reduction in the rate of speech, or both, to maintain synchrony. Bellugi and Fischer also found that the rate of transmission of propositions ("underlying elementary sentences") in American Sign Language and spoken English were not appreciably different. Thus, it is conceivable that the more an auxiliary system borrows from the lexicon (and grammar) of ASL, the more synchrony could be achieved. However, achieving synchrony in this way might lessen the integrity of the system's representation of English. With the introduction of grammatical devices from ASL into manual representations of English, we leave the realm of in-

vented systems and enter that of pidginized varieties, specifically Pidgin Sign English (PSE), the discussion of which is reserved for a later section of this chapter.

Studies in the literature have compared oral and manual production of English by parents (e.g., Crandall, 1978) and by teachers (e.g., Marmor and Petitto, 1979). These studies concluded that function words (e.g., articles and prepositions) and inflections (e.g., past tenses) were often omitted in the manual production of the normally-hearing adults observed. Crandall further concluded that the accuracy of a child's sign production correlated highly with that of the mother. In support of Marmor and Petitto's findings, Geers, Moog, and Schick (1984) observed considerable variability in the manner and degree to which teachers used manually coded English. In their study of 327 profoundly deaf children (5 to 9 years of age) from oral-aural and total communication programs across the United States, they assessed the effect of communication mode (and age) on signed and spoken production of selected English language structures. They examined elicited and imitated production of 16 target structures and found that the overall signed and spoken production of the total communication children did not differ significantly from spoken productions of the oral-aural children. The quality and/or consistency of signing is generally recognized as an important educational variable in these debates, but the quality and/or consistency of oral modeling is equally important and needs to be recognized as such since language acquisition depends more on the integrity or quality of verbal intake than on its modality. Also, the amount of training necessary to produce skilled talkers, fingerspellers, and signers, and the effect of age on acquisition of these skills need to be considered (see, for example, Caccamise, Garretson, and Bellugi, 1981).

In summary, research reports on the ability of children and adults to process English through fingerspelling or auxiliary sign systems (Wilbur, 1979; Caccamise, 1978; Caccamise et al., 1983;) indicate that English can be received effectively when speech is used with signing and/or fingerspelling. However, when speech is not used, it is not entirely clear how much grammatical information is processed by the student (and under what conditions).

Pidgin Sign English and American Sign Language

VARIETIES

In 1969, Rainer, Altschuler, and Kallman estimated that approximately 75% of deaf adults used American Sign Language. More recent estimates, however, indicate that the actual proportion of ASL users may be considerably lower. With hearing persons (primarily educators) who

do not know ASL, deaf individuals tend to use a variety sometimes called Pidgin Sign English (Woodward, 1973; Woodward and Markowicz, 1980; cf. "Ameslish" in Bragg, 1973). Deaf adults vary greatly with respect to the amount of English vocabulary and structure used in their signing. Not surprisingly, deaf users of ASL have been viewed as a minority language community that has come into close and prolonged contact with the linguistically and socially dominant group of English speakers. Woodward and Markowicz (1980) have described the relationship between ASL and English as one of "diglossia with bilingualism," with ASL used in informal interchanges involving family and friends and English in more formal contexts such as educational settings. Although sometimes regarded as inferior to English by its users, ASL is nevertheless a badge of in-group solidarity. It has changed rapidly over the years, especially in the area of vocabulary, and exhibits a great deal of interuser variation. As Fischer (1978) points out, these characteristics could well describe the sociolinguistic situation in a creole community. Fischer, like Woodward (1978), regards ASL as the "basilect" (cf., "Ameslan" in Fant, 1972) on a linguistic (postcreole) continuum that ranges from varieties bearing little resemblance to English to varieties very close to standard English, the "acrolect." Included at the acrolect end of the continuum are what Fant calls "Siglish," Visible English, and the auxiliary sign systems. On such a continuum, PSE constitutes a large middle range, the "mesolect."

In this chapter, a sharper distinction has been drawn between ASL and PSE on the one hand and the auxiliary manual systems on the other. We argue that, although they share the same modality, Visible English and the auxiliary sign systems should be differentiated from varieties of PSE and ASL on socio- and psycholinguistic grounds that set auxiliary languages apart from natural languages.

Circumstances surrounding the use of the auxiliary manual systems in some ways resemble those of oral pidgins. Most of the world's pidgins originated in seaports and marketplaces where they served mercantile purposes among individuals having limited, transitory contact; the auxiliary manual systems were created for use in educational settings to serve instructional purposes among teachers and students. These systems, like pidgins, are typically limited to an instrumental function as opposed to older, more developed languages that serve expressive and integrative functions as well within a cultural context (Smith, 1972; see also Lyons, 1977). In one crucial respect, however, auxiliary manual systems differ from pidgins: They were created systematically by educators and are perpetuated by educational intervention. In contrast, pidgins are inherently unstable varieties that are created by their users and tend either to develop into creoles or to disappear after a few generations.

A second point is that striking parallels have been noted between