

CONCEPTS OF LANGUAGE DEVELOPMENT A REALISTIC PERSPECTIVE

David Crystal

Problems for the clinician

There are five main problems for clinicians and researchers who approach the field of language development and disorders. First, there is the enormous number of variables that have to be taken into account when dealing with such tasks as screening, assessment, diagnosis and treatment. In English pronunciation (phonology) there are over 40 sound-units (or phonemes) in most accents, and several hundred ways in which these units combine to produce words. There are over a thousand features of grammatical construction. The vocabulary is conservatively estimated to contain over a million words; and English has a range of dialects and styles of use which, because of its worldwide status, has produced more usage variation than any other language.

Secondly there is the problem of description. Some aspects of language have received a fairly thorough surface description, but their underlying organisational principles have been little investigated. A good example is vocabulary; there are many good, large dictionaries, but there is very little explanation available of how networks of words define each other and come to be learned. The alphabetic organisation of a dictionary is useless as a guide to learning, since children do not learn words in alphabetical order. Another example is pronunciation: such features as intonation and tone of voice have been given a very limited surface description. Thirdly, even for those areas that have been studied in detail, there is the problem of describing and labelling the symptoms. Obtaining accurate information about language, in the form of recordings and transcriptions, describing and analysing the patterns in the data, and (from a clinical viewpoint) reducing the number of variables, have been major preoccupations of clinical linguistic researchers in recent years (Crystal 1981). But the descriptions are inevitably somewhat abstract (in the interests of making generalisations) or technical (in the interests of precision), and this raises the question of how to promote the use of a satisfactory clinical 'language for talking about language'. The everyday terminology of linguistic description (terms such as 'sentence', 'word', 'vowel', 'syllable') is inadequate because people's definitions are often very different. Those who wish to specialise in language development and disorders need to develop an awareness of terminology for describing linguistic symptoms which goes beyond the popular.

Fourthly, all the remarks so far have been made with the description of normal adult language in mind. Hardly any of the major categories of *child* language handicap have been described in a linguistically comprehensive manner—comparable to the kind of meticulous and all-embracing symptomatology which is

routine in medical science. Whether the handicap is identified aetiologically (e.g. deafness, mental retardation, cleft palate) or impressionistically (e.g. delayed, functional, deviant), a thorough behavioural description is usually lacking. One therefore lacks a clear sense of the range of symptoms involved, of their consistency of distribution in samples, and of their frequency.

Finally, while a great deal of clinical linguistic research is now being devoted to the task of describing the linguistic properties of samples taken from language-disordered children, with the aim of providing better assessments and individual remediation programmes, hardly any of this research is longitudinal in orientation. For instance, there are now several published studies of the range of grammatical variability one would expect to find in the grammatical skills of language-delayed four-year-olds. But I know of no published study that plots the 'natural history' of the delay, and monitors its subsequent development during treatment. At present, predicting the course of a language disorder's development can only be guesswork (Crystal 1984).

Such reasons presumably explain why accounts of language abilities and disabilities in local government record forms, and suchlike, are generally so vague as to be meaningless, or opt for variables which (though irrelevant) are at least easier to identify. Examples of the former include the heading 'language', without further gloss, on one record chart; another had the same heading, but also a subheading which read, optimistically, 'scores'. Examples of the latter include the mania for counting things, which at times is seen almost as a panacea: one counts the number of words children have been observed to use, or the number of words in their sentences, or the number of distinct sounds they have articulated. But simple quantitative measures of this kind do not lead very far. For example, to say that two children both have a vocabulary of 50 words (not an easy matter to decide about in the first place, incidentally) does not say anything about their relative level of language learning. One child might have learned the words by heart, whereas the other might be using them productively and creatively; one might have basic, concrete vocabulary, whereas the other might have more advanced, abstract vocabulary; and so on. Similarly, to say that two children are both producing four-word sentences tells us very little: the crucial question is 'which kind of words?', 'what sort of sentence structure?'. It is easy to count the length of a sentence; but, having counted, you are no nearer understanding the basis of a child's language disorder, without further linguistic study. To stay with quantitative measures, without supplementing them by qualitative criteria, is to be looking in the wrong place for an explanation of language disorder.

Basic concepts

Language and communication are not synonymous. There are many functions of language other than for interpersonal communication—for example, to release emotion when one is on one's own, or to build up a rhythm for work or play. Likewise, there are many ways of communicating other than by language. All such behaviours are included in the descriptive framework of *semiotics*. Semiotics has received many definitions, but the one that seems most relevant for clinical

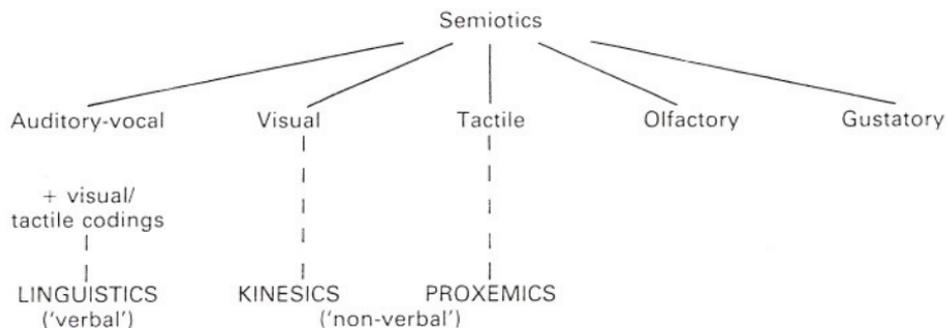


Fig. 1. The semiotic frame.

purposes is 'patterned communication in all modalities' (Sebeok *et al.* 1964). The approach stresses 'the interactional and communicative context of the human use of signs, and the way in which these are organised in transactional systems involving sight, hearing, touch, smell, taste'. This broad perspective is to be welcomed, to remind us of the potential communicative rôle of all sensory modalities, including those (such as touch) whose relevance has been underestimated, and those (such as smell and taste) whose relevance is generally ignored—though one can hardly doubt the importance to children of the 'passive' signals they receive through these modalities. However, only the first three of the five modalities have been studied extensively and become institutionalised in the academic literature (see Fig. 1), which recognises the domains of linguistics, kinesics and proxemics.

The use of the auditory-vocal channel as a means of human communication (*i.e.* 'speech', or, more precisely, 'spoken language') is pre-eminently the concern of *linguistics*. But other visual or tactile 'codings' based on speech would also be subsumed under the heading of linguistic study—first-order codes, such as writing ('written language'), or second-order codes, such as finger-spelling. More complex signing systems, too, have to be allowed for: those that have a direct relationship with the patterns of spoken or written language (such as the Paget-Gorman Signing System) and those that do not (such as British Sign Language); see Crystal and Craig's 1978 review of various systems. *Kinesics* includes the study of facial expression and bodily gesture—purely visual systems of communication, lacking any derivational connection with spoken or written language, and lacking the scope and productivity that one associates with deaf signing systems. *Proxemics* studies the tactile medium of communication (*e.g.* hand-shaking), or the way that variations in physical distance between human beings can be used as a communicative signal. Again, a distinction must be drawn between the everyday use of proxemic behaviour, which is quite limited in scope, and the contrived use of such behaviour in specially designed signalling systems, such as are used with the deaf-blind.

The distinction between linguistic behaviour on the one hand, and kinesic/proxemic behaviour on the other, is similar to that often encountered in psychology between 'verbal' and 'non-verbal' communication. But the verbal/non-verbal

terminology obscures the importance of non-segmental features of intonation, rhythm, tone of voice and the like, which are clearly vocal but not verbal. No binary division does them justice, for at one extreme such features interact closely with the structures of spoken language (in such contexts as stating/questioning, or focusing attention on particular words in a sentence), and at the other extreme they are used for the communication of emotion, in a similar way to kinesic or proxemic behaviour.

There is little to be gained by extending the use of the word 'language' to cover all the domains of semiotic enquiry, as is often done through the use of such expressions as 'body language'. In these expressions, the term has become synonymous with 'communication', and a valuable distinction is in danger of being lost. However, clear differences exist between the kind of behaviour demonstrated by the use of spoken/written language and that encountered in the kinesic/proxemic domain. The remarkable *productivity* (or creativity) of the grammar and lexicon of language is one criterion of difference; another is the *dual structure* of language (a level of meaningless units—such as sounds or letters—combining to form a level of meaningful units, such as words and sentences). Some writers have argued that there are major qualitative differences between spoken/written language, and the various kinds of non-verbal communication (Hockett 1958, Hockett and Altmann 1968). Concept-based deaf signing systems sit somewhat uneasily between the two, but current social attitudes forcefully support their characterisation as 'language'. Focusing on the dissimilarities between spoken/written language and signing systems is generally felt to be counter-productive.

The structure of language

All linguistic theories draw a distinction between the structural properties of language and the range of functions to which language can be put, and this distinction is highly relevant to the investigation of language handicap. On the one hand, there are people whose handicap limits their ability to use the structures of spoken/written language; on the other hand, there are those whose control of structure is relatively advanced, but who lack the ability to put these structures to good use in real communicative situations. Within these two broadly defined areas of *language structure* and *language use*, several important dimensions have come to be routinely identified.

Most accounts recognise three main branches of language structure: *semantics*, *grammar*, and the properties of the *transmission system* chosen (*i.e.* whether spoken, written or signed). Semantics is the study of how meaning is structured in language. At the most general level, it involves the study of the way we organise the meaning of what we want to say or write into stretches of language (often called discourses or texts). Discourse breakdowns are common in handicapped language, such as when questions are not answered appropriately, or when irrelevant or disjointed remarks are introduced into a conversation. At a more detailed level, semantics involves the study of vocabulary – not just by making lists of words (more precisely, 'lexical items'), but a study of how these items relate to and define each other (Crystal 1981, 1982). It is the learning of these relationships that constitutes

the main task in the acquisition of vocabulary. One cannot assess lexical ability simply by counting the number of words someone uses, for as we have seen two people may have similar sizes of vocabulary, but be very different in their awareness of how the lexical items relate to each other.

The distinction between semantics and grammar can be made in the following way. If we want to make a request for a locked door to be opened, there are innumerable ways in which we might express this, using the same vocabulary, and also many ways in which the language does not permit us to express this request. Among the permitted ways are such sentences as 'I need a key to open the door', 'This door needs a key', and 'If we had a key we could open this door'. Among the disallowed sentences are 'Need I a key this door to open', 'Open could the door a locked', and so on. Grammar is the study of sentence structures and sequences, from the viewpoint of which strings of words are acceptable in a language, and how they relate to each other. It is often subdivided into *morphology* (the study of the way individual words can be changed by adding different prefixes or suffixes, and by joining units together in various ways, e.g. *go/going/gone*, *nation/nationalisation*) and *syntax* (the study of the way in which words are strung together to make up the phrases and sentences of a language, and the relationships between these patterns, e.g. questions/statements, positive/negative, active/passive). Not surprisingly, in view of the complexity involved, grammatical disability is a major feature of most kinds of language handicap. And, as with semantic analysis, simple measures of grammar in terms of sentence length (for instance) do not capture this complexity: two people may use similar sentence lengths, but be vastly different in the kind of grammatical structures they are able to handle (Crystal *et al.* 1976).

The third branch of language structure refers to the way we transmit the message—whether in speech, or in writing, or using some other medium. Restricting the case to speech, we immediately have to distinguish between those properties of the transmission system which are independent of a particular language, and those which are dependent. The problems which arise from the first of these headings are very different from those which arise from the second. Unfortunately the everyday term 'pronunciation' does not make this distinction clear, and so new terminology has to be introduced to deal with it. It is now conventional to distinguish between *phonetics* (the vast range of sounds that the human vocal tract can produce and the human ear perceive) and *phonology*—the much more restricted range of sounds which actually appear in a language.

In the absence of any pathology, all human beings are born with the same capacities for sound in their ears, vocal tracts and brains. Similarly, pathologies of hearing, articulation or nervous system affect speakers all over the world in the same way, regardless of the language community in which they live—for example, the nasal resonance of a cleft-palate child will be apparent whether the child learns German or Chinese. But when speakers have an intact auditory, articulatory and nervous system, it does not therefore follow that they will be able to learn the sound system of their language efficiently—and when there is a disability here (a 'specific' learning disability for some of the sounds of this system), each language has to be studied in its own terms. A child with an immature or deviant

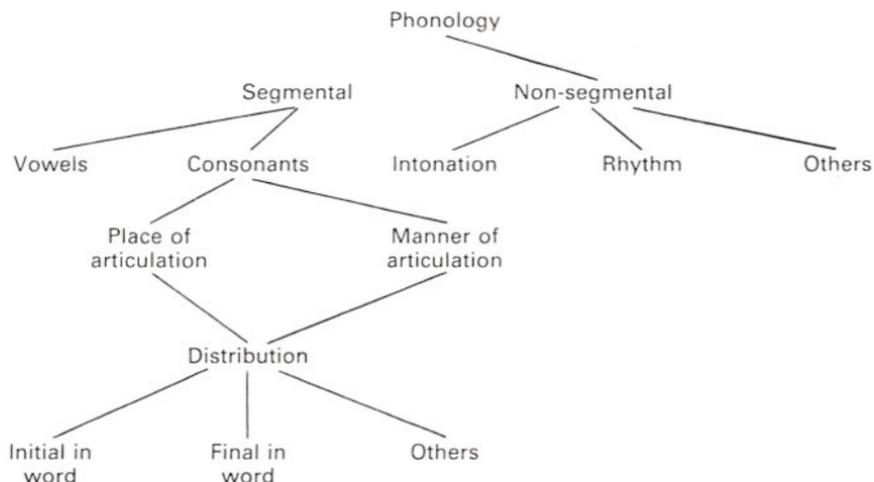


Fig. 2. Levels of detail in phonological analysis.

pronunciation of English will seem very different from one with an immature or deviant pronunciation of French or Chinese. The assessment procedures must be different, and remedial work proceeds along quite different lines.

So it is unhelpful to say that a child has 'poor pronunciation', unless it is clear whether the problem is seen primarily as biological (as conventionally defined in terms of anatomical, physiological or neurological abnormality) or as a psycho—linguistic one (as conventionally defined in terms of the learning of psychological processes or linguistic rules). Many children suffer from both kinds of handicap. The cleft-palate child, for instance, will have poor pronunciation which is partly explained by the anatomical deficiency and the associated neurophysiological abnormalities. But other aspects of the problem may not be so easily explained, suggesting that there may be elements of a learning difficulty as part of the history of that handicap too. Part of the difficulty of making a good diagnosis and planning appropriate remedial help is due to the complex way in which phonetic and phonological aspects of a disorder interact and overlap. It is especially easy to assume, in cases of severe physical handicap, that the problems are solely phonetic in character; but the existence of phonological learning problems in these children is widespread, and may be universal.

These problems can be illustrated by looking at the way in which a phonological investigation can probe a child's pronunciation problems, at increasingly detailed levels (Fig. 2). An initial division is made between those features of sound which can be identified as segments, and those which cannot. Under the first heading, we have all the consonants and vowels, and the ways in which they combine to form syllables. Under the second heading there is intonation and rhythm, which stretch over whole words and sentences. Children may develop a phonological problem in their vowel/consonant segments, or in their intonation/rhythm patterns, or in both. Next we have to ask whether all segments are likely to

be affected, or only vowels, or only consonants; and then what kinds of vowels or consonants might be affected. One needs to classify consonants according to their place of articulation (lips, teeth-ridge *etc.*) or their manner of articulation (whether they are nasal, voiced, plosive, *etc.*). Lastly one has to describe their distribution—whether the errors appear whenever a phoneme is used, or only sometimes (*e.g.* only at the ends of words).

The use of language

The range of linguistic variables discussed so far concerns the relatively 'tangible' dimension of language structure—the strings of sounds, words and structures that come 'out of the mouth and into the ear'. The study of written language or of signing would have led to a similar structural account, though terminology would have differed to some extent (for instance, the notion of phonology being replaced by graphology, in the study of writing). Under the heading of language in use, a quite different range of variables is involved, as here we are dealing with the analysis of the situations in which language is found, and of the people who are involved in the act of communication. To impose some order on the enormous scope of this dimension, it is common to identify three broad parameters of variability, relating to temporal, social and psychological factors. *Temporal* variation in language use refers to the way in which language changes over time, both in the long term (as when Anglo-Saxon develops into modern English) and in the short term (as in current debates about English usage). *Social* variation in language use refers to the way in which language varies in terms of the regional or social background of the users – a domain which includes such notions as dialects, occupation, social status and social rôle, and which is generally studied under the heading of sociolinguistics. The sociolinguistic consequences of biological difference (such as sex, age or handicap—'Does he take sugar?') can also be included in this category. Thirdly, *psychological* variation in language use refers to the way in which language varies in terms of the capacities of the individual user—a domain which includes memory, attention, intelligence and personality, and which is generally studied) under the heading of psycholinguistics. The analysis of individual differences, and of task effects on language, is also a major concern for the psycholinguist, and one which is of particular relevance to clinical studies. So too is the field of language learning, which is usually placed under this heading because of its dependence on cognitive abilities; the more restricted field of child language acquisition therefore often being referred to as 'developmental' psycholinguistics (see below).

The distinction between language structure and language use is a simple and attractive one, but it is misleading in one important respect. There are several features of language that cannot be identified without the equal participation of both dimensions. Terminology varies, but these days reference is generally made to them under the heading of *pragmatics*, and recently the pragmatic aspects of language development and language handicap have attracted particular attention (Ochs and Schieffelin 1979, Gallagher and Prutting 1983). Pragmatics has received many definitions, but essentially it refers to the study of the factors that govern

users' choice of utterance, arising out of their social setting. It includes the assumptions people make when they communicate, the intentions underlying what they say, the way context influences the amount they say or the way they say it, the turn-taking which makes a conversation run smoothly, and the appropriateness of the subject matter to a situation. Problems of a pragmatic kind are widespread in the study of language handicap, due to the limited awareness children have of the nature of linguistic interaction, and the uncertainty many adults feel about how they should act when they meet a handicapped child. Nor are professionals free of pragmatic uncertainty: witness the current debates over what level of language to use to a child, whether one should speak or sign or both, and whether one should adopt a structured or a free conversational therapeutic style. Language is primarily an interactive phenomenon. The description, assessment and remediation of a handicap depend totally on taking into account the implications of this axiom.

Recent textbooks on pragmatics (*e.g.* Leech 1983, Levinson 1983) illustrate the great breadth of this subject, and show how difficult it is to present a single classification of pragmatic variables which would satisfy everyone. At one extreme, pragmatics is closely related to semantics and to other structural levels of language—so much so that some scholars would be prepared to call it a 'level' of language structure. At the other extreme, pragmatics is closely related to sociolinguistics and psycholinguistics, focusing upon matters of usage and extralinguistic context which have no direct relationship to language structure. In relation to the first extreme, there are clear cases where it is possible to make a pragmatic error by wrongly using aspects of language structure—using *tu* instead of *vous* in certain circumstances in French, for example. On the other hand, it is also a pragmatic 'error' to tell a joke at a funeral, but here there is nothing in the structure of the language to explain why this is wrong. Because of this range of subject matter, I think it is premature to talk of 'pragmatic disorders', as it is not possible to provide an unequivocal theoretical definition of what is involved. But the importance of pragmatic factors in the investigation of language handicap is undeniable.

These observations about language structure and use are summarised in Figure 3 (with reference to the spoken medium only).

Psycholinguistics

If psycholinguistics had remained a theoretical field, it would doubtless have developed a clear identity, as a bridge between theoretical linguistics and cognitive psychology—as is suggested by several definitions of the subject. Slobin (1971) defined it as 'the mental processes underlying the acquisition and the use of language'. Clark and Clark (1977) described psycholinguistics as 'the study of three mental processes—the study of listening, speaking, and of the acquisition of these two skills by children'. But very early on, people wanted to use psycholinguistics to solve problems in language acquisition and use, especially in relation to speech pathology, the teaching of reading, and learning a second language. There has also been a recent trend to investigate problems from fields as diverse as medicine and literary criticism. The result has been a considerable diversification of subject

matter, and a range of overlapping interpretations about what psycholinguistics is. It is therefore important to distinguish clearly between theoretical psycholinguistics, as defined above, and applied psycholinguistics, where the aim is (as the editorial policy of *Applied Psycholinguistics* states) to report work 'in which applied problems are approached from the standpoint of basic research and theory' (my italics).

Clinical psycholinguistics may be defined as the study of breakdown in linguistic behaviour, and of the principles governing this breakdown, as people interact, socially and biologically, with their environment—and especially with their clinicians, clinical materials and clinical settings (Crystal 1984). Similarly, with reference to the analogous situation in schools, one might define a *remedial* psycholinguistics, where the same definition would apply, except that the last part would read 'teachers, teaching materials and educational settings'. Clinical/remedial psycholinguistics tries to explain language breakdown by exploring the relationship between linguistic behaviour and such psychological factors as memory, attention and perception. The clinical linguist can describe the patterns of linguistic disability which emerge, and can sometimes explain the nature of a patient's handicap purely with reference to his procedures. But more often the explanation of a patient's difficulty lies elsewhere—in a limited auditory short-term memory, for example, or in emotional disturbance. In such circumstances the linguist's account is inadequate, and a more general perspective must be achieved. It is this perspective which a psycholinguist aims to provide.

The investigation of all these factors is routine in speech pathology/therapy, as part of assessment and remediation, but the aim there is to intervene and obtain progress. The aim of psycholinguists is not so vocational: they wish to study these factors in order to understand the reasons for the linguistic handicap. Their aim is to model and predict patients' language behaviour, in the light of other behavioural abilities. Clinical/remedial psycholinguists, *qua* psycholinguists, will stop their investigation once they can model a patient's performance this way. They will not attempt to do anything about it. That is the business of others, such as speech therapists and remedial language teachers.

In practice, however, this distinction is sometimes obscured by individual personalities and clinical settings. Many clinicians and teachers have now been trained in psycholinguistic techniques, and use them routinely in their work. This is beneficial, for the more that therapy or teaching can be informed by principles deriving from psycholinguistics, the more systematic, economical and effective the intervention is likely to be. Likewise, many psycholinguists these days work routinely in clinics and classrooms, which they see as a testing ground for their hypotheses about breakdown. But there is no identity between the two rôles.

Nor, lastly, is there identity between the rôles of speech pathologist/therapist and the profession of remedial language teacher—even though some individuals exercise both rôles by virtue of a dual training. The rôle of the speech pathologist/therapist is to establish a patient's control over all the linguistic skills necessary to ensure a happy and successful life in the world at large—which means primarily the 'core' of skills involved in everyday conversation. The remedial

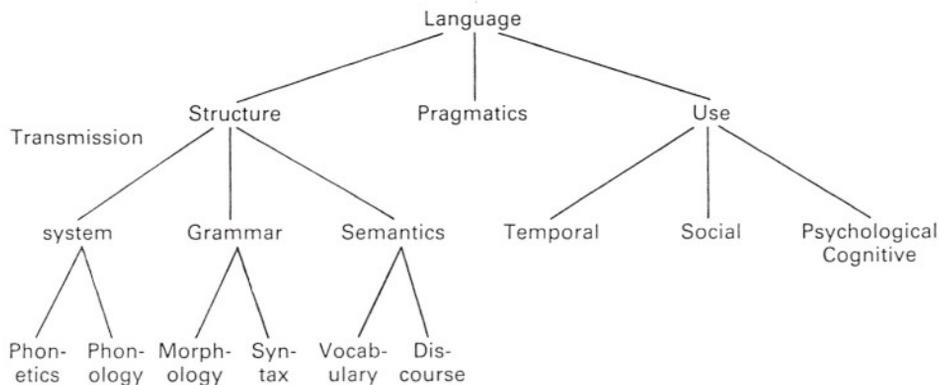


Fig. 3. The main areas of spoken language structure and use.

language teacher, by contrast, has to lead a child through the educational curriculum, and must bridge the gap between the child's core language abilities and the demands placed upon those abilities by the curriculum. Maths, science projects, reading, religious education and other subjects all have their own linguistic identity, and have to be approached differently.

Conclusions

A normal development of language requires balanced progress under each of the headings in the above figures (Figs. 1-3). It is of little value to be able to articulate sounds beautifully if one has few words or structures to use them in; and conversely, an excellent control of grammar and a deviant phonology is of limited use. Any valid procedure to be used in screening, assessment, diagnosis or treatment must, at the very least, have a slot available for each of these headings.

How far it is possible to reduce the many details encountered under each of these headings to a very small set, capable of being reduced routinely in clinical situations, is less clear. For example, in the grammatical assessment procedure known as LARSP (Crystal 1982), there are over 100 grammatical variables (in itself a massive simplification of the range available in English). As a result of current research, it is gradually beginning to emerge which of these variables are the most diagnostic. The central rôle of verbs, pronouns, question-words, certain types of clause structure and clause sequence, and several other features, are factors whose significance repeatedly emerges, in working with children in the second and third year (see Chapter 5). And similar selections are beginning to be made for other areas of language. What is essential is that all such findings are integrated within a general framework, to avoid ending up with an incoherent inventory of facts. It is this framework which familiarity with the terminology and conceptual apparatus of scientific language thinking can help to provide.

REFERENCES

- Clark, H. H., Clark, E. V. (1977) *Psychology and Language: An Introduction to Psycholinguistics*. New York: Harcourt, Brace, Jovanovich.
- Crystal, D. (1981) *Clinical Linguistics*. Vienna: Springer.
- (1982) *Profiling Linguistic Disability*. London: Edward Arnold.
- (1984) *Linguistic Encounters with Language Handicap*. Oxford: Blackwell.
- Craig, E. (1978). 'Contrived sign language.' In: Schlesinger, I., Namir, L. (Eds.) *Sign Languages of the Deaf: Psychological, Linguistic and Sociological Perspective*. New York: Academic Press, 141-68.
- Fletcher, P., Garman, M. (1976) *The Grammatical Analysis of Language Disability*. London: Edward Arnold.
- Gallagher, T. M., Prutting, C. A. (1983) *Pragmatic Disorders of Spoken Language*. San Diego: College Hill Press.
- Hockett, C. F. (1958) *A Course in Modern Linguistics*. New York: Macmillan.
- Altmann, S. (1968) 'A note on design features.' In: Sebeok, T. A. (Ed.) *Animal Communication* Bloomington: Indiana University Press, pp. 61-72.
- Leech, G. N. (1983) *Principles of Pragmatics*. London: Longman.
- Levinson, S. C. (1983) *Pragmatics*. Cambridge: C.U.P.
- Ochs, E., Schieffelin, B. B. (Eds.) (1979) *Developmental Pragmatics*. New York: Academic Press.
- Slobin, D. I. (1971) *Psycholinguistics*. Glenview: Scott, Foresman.
- Sebeok, T. A., Hayes, A. S., Bateson, M. C. (Eds.) (1964) *Approaches to Semiotics*. The Hague: Mouton.