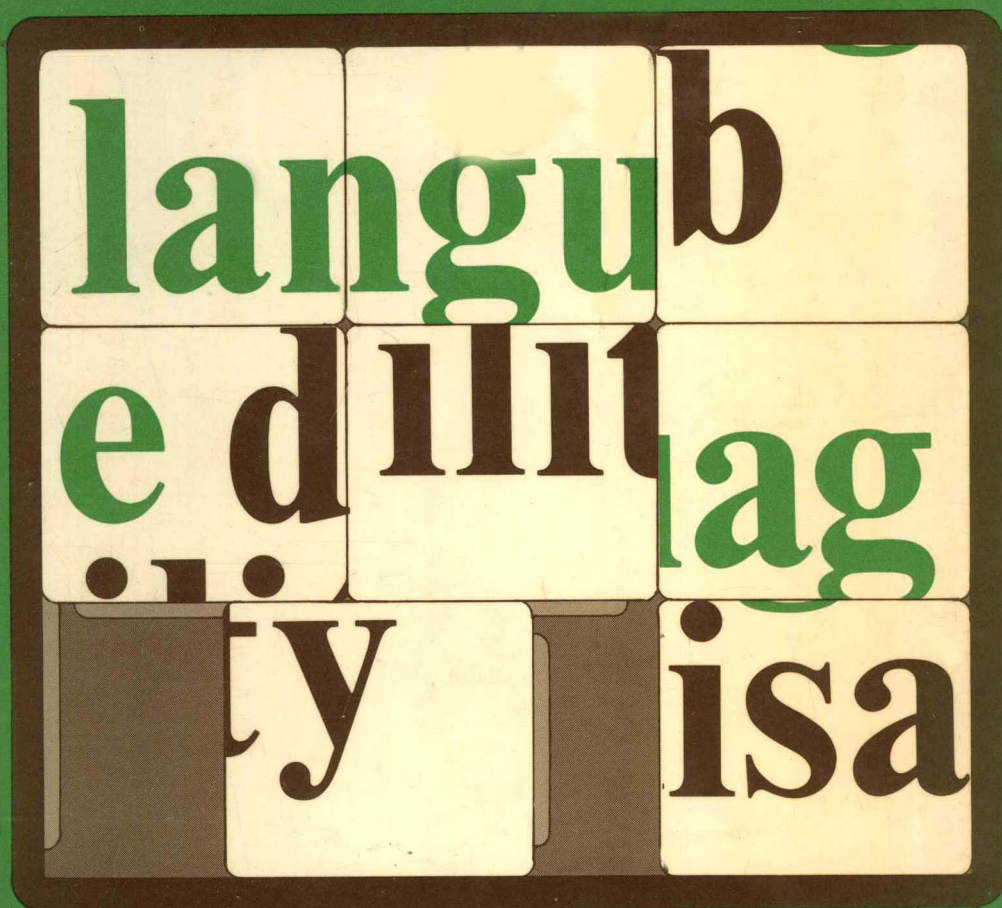


Phonological disability in children

David Ingram



Studies in language disability and
remediation 2

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General preface

This series is the first to approach the problem of language disability as a single field. It attempts to bring together areas of study which have traditionally been treated under separate headings, and to focus on the common problems of analysis, assessment and treatment which characterize them. Its scope therefore includes the specifically linguistic aspects of the work of such areas as speech therapy, remedial teaching, teaching of the deaf and educational psychology, as well as those aspects of mother-tongue and foreign-language teaching which pose similar problems. The research findings and practical techniques from each of these fields can inform the others, and we hope one of the main functions of this series will be to put people from one profession into contact with the analogous situations found in others.

It is therefore not a series about specific syndromes or educationally narrow problems. While the orientation of a volume is naturally towards a single main area, and reflects an author's background, it is editorial policy to ask authors to consider the implications of what they say for the fields with which they have not been primarily concerned. Nor is this a series about disability in general. The medical, social, educational and other factors which enter into a comprehensive evaluation of any problems will not be studied as ends in themselves, but only in so far as they bear directly on the understanding of the nature of the language behaviour involved. The aim is to provide a much needed emphasis on the description and analysis of language as such, and on the provision of specific techniques of therapy or remediation. In this way, we hope to bridge the gap between the theoretical discussion of 'causes' and the practical tasks of treatment—two sides of language disability which it is uncommon to see systematically related.

Despite restricting the area of disability to specifically linguistic matters—and in particular emphasizing problems of the production and comprehension of spoken language—it should be clear that the series' scope goes considerably beyond this. For the first books, we have selected topics which have been particularly neglected in recent years, and which seem most able to benefit from contemporary research in linguistics and its related disciplines, English studies, psychology, sociology and education. Each volume will put its subject-matter in perspective, and will provide an introductory slant to its presentation. In this way, we hope to provide specialized studies which can be used as texts for components of teaching courses, as well as material that is directly applicable to the needs of

professional workers. It is also hoped that this orientation will place the series within the reach of the interested layman—in particular, the parents or family of the linguistically disabled.

David Crystal
Jean Cooper

Preface

There is a delicate balance between personal interest and social need that has to be maintained each time an author takes on the important responsibility of writing a book. This is often forgotten in the commonplace statement that a book was written because there was a need for it. If one uses need in the sense of a lack of other works of exactly the same treatment, then indeed most books do satisfy a need. The need in these cases, however, is homogeneous with the research interests of the author. This may lead (although not inevitably so) to books on such specialized topics that they are only of interest to a handful of experts in the area.

This point was an important part of my decision to write a book on phonological disability in children instead of several other possible topics. This area is one of several that I find of great personal interest, yet I would be hard put to select one over another on that basis alone. Other social factors, however, enter into the decision. The first is the concern for practical application. In recent years, the progress made in the study of normal language acquisition has provided some exciting prospects in applying these findings to children with language disorders. As the quotation from Piaget at the beginning of this book so beautifully puts it, 'the mark of theoretical fertility in a science is its capacity for practical application.' While the theoretical work needs to continue, we have accumulated enough knowledge to allow application to be developed.

Even once this decision is made, there is still the problem of selecting the area to focus upon. Phonology was chosen for several reasons. For one thing, practical work in deviant phonology is currently behind that in the area of syntax in terms of availability to the public. At least two excellent books have already appeared on syntax, those of Tyack and Gottsleben (1974) and Crystal, Fletcher and Garman (1976). In addition, the articles available on phonology are often diverse and theoretical, making it difficult for clinicians to see their practical application. There is currently a gap between the rich and growing corpus of knowledge about both deviant and normal phonological development and the daily needs of language clinicians working with children who have phonological disorders.

The present book is an attempt to bridge this gap. As such, it is written specifically for language clinicians instead of linguists and psychologists, although I hope it will also be of interest to the latter. I have used a minimum of technical linguistic terminology and have tried whenever possible to define basic terms. Each chapter is designed to focus on an issue of specific interest to clinicians. The first chapter

provides background information on the history of the study of child phonology, and addresses the all-important question of the potential contribution and limitation of linguistics. Next, there is an important chapter that outlines the development of phonology in normal children. This is needed in order to understand the process and compare it with aspects of development in deviant children. It is a long chapter because there is currently no book on normal child phonology. Since the key to clinical work is to be able to analyse the speech of children, chapter 3 provides a phonological analysis of a deviant child's speech. This is done to provide a model against which the clinician can compare his or her own analysis. The next chapter deals with the methodological issues of sampling, phonetic transcription, and testing. The last two chapters turn specifically to theoretical and practical questions. Chapter 5 provides a detailed comparison of the phonological characteristics of deviant speech with those of normal children, based on data available in the literature. It approaches the question of what constitutes deviant phonology. The last chapter directly discusses therapy and the application of the findings set out in earlier chapters. It also evaluates some hypotheses that have been proposed in the literature. As Piaget advises, throughout the book 'facts take precedence over theory.'

It would of course be impossible to acknowledge everyone who has contributed either directly or indirectly to the writing of this book. By far the most influential person has been Charles Ferguson, to whom it is dedicated. His contribution has been multidimensional. As my professor at Stanford University, he introduced me to child language in general and child phonology in particular—he has an international reputation in both. Since the completion of my PhD he has continued to stimulate my ideas through discussions and his papers on child phonology. From the beginning, he has taught me the importance of the need for practical application in linguistics, and the necessity to acquire facts before constructing theory. In the summer of 1974 he organized a seminar on deviant child phonology at Stanford University at which I taught, and which I used as the preparation for this book. It was one of the few applied courses of its kind ever offered in a linguistics programme. I would like to thank the many people I have met through the Institute for Childhood Aphasia who have helped me to understand better the various aspects of language disorders in children, especially Don Morehead, Jon Eisenson, Judith Johnston, Dee Tyack, Bill Rosenthal and Bob Gottsleben. I have benefited from conversations on deviant phonology from Mary Edwards, Kim Oller, and Arthur Compton. I owe a special appreciation to the members of the seminar I taught at Stanford, who helped me in many ways—Debbie Bresler, Tony Gillespie, Marcy Macken, Jan Moyers, Susan Payne, Irene Vogel and Brendan Webster. Lastly, two others have had a direct and immediate role in the writing—Judith Ingram, who read the book and straightened out many convoluted sentences (the responsibility for all that remain is my own), and David Crystal, joint editor of the series in which it appears, who arranged for its publication, provided editorial revision, and has in general continued to demonstrate a serious commitment to making linguistics socially responsible.

Notation

The symbols presented below attempt to explain the wide range of notation used throughout the text. Since data have been cited from a variety of sources, there are occasional cases of different symbols for the same phonetic event. To capture this, I have placed alternant symbols in parentheses next to the more commonly used ones. Also, the use of various diacritics differs from one investigator to another. Thus the diacritics constitute a composite list rather than a set of consistent symbols used throughout.

Vowel symbols

	Front		Central	Back	
	unround	round		unround	round
high	i (iy)	ü		ɪ	u (uw)
	ɪ				ʊ
mid	e (ey)	ø (ø)			o (ow)
	ɛ		ə		ɔ
			ʌ		
low	æ			a	

Examples of English vowels

i	<u>f</u> ee <u>t</u> , <u>m</u> ea <u>t</u> , <u>b</u> ee
ɪ	<u>p</u> it, <u>f</u> iddle, <u>k</u> id
e	<u>m</u> ay, <u>pl</u> ate, <u>g</u> ate
ɛ	<u>b</u> et, <u>p</u> et, <u>b</u> etter
æ	<u>c</u> at, <u>l</u> atin, <u>f</u> at
ə	<u>s</u> ofa, <u>a</u> bout, tele <u>ph</u> one
ʌ	<u>b</u> ut, <u>f</u> un, <u>b</u> utter
u	<u>f</u> ood, <u>tw</u> o, <u>coo</u>
ʊ	<u>fo</u> ot, <u>w</u> ould, <u>pu</u> t
o	<u>go</u> at, <u>low</u> , <u>th</u> row
ɔ	<u>ba</u> ll, <u>saw</u> , <u>fo</u> ught
ɑ	<u>h</u> ot, <u>bo</u> mb

Diphthongs

ay (ai) (aj)	<u>b</u> ite, <u>f</u> ight, <u>l</u> ight
æw	<u>c</u> ow, <u>h</u> ow, <u>h</u> ouse
oy	<u>b</u> oy

Consonant Symbols

		<i>Positions (see below)</i>							
		1	2	3	4	5	6	7	8
Stops	vl	p			t			k	ʔ
	vd	b			d			g	
Affricates	vl				ts	č			
	vd				dz	ǰ			
Fricatives	vl	ø	f	θ	s	š(j)		x	h
	vd	β	v	ð	z	ž		ɣ	ɦ
lateral					ɬ				
Nasals		m			n		ɲ	ŋ	
Liquids					l, r				
Glides		w					y		

vl = voiceless

vd = voiced

Positions

1 = labial	4 = alveolar	7 = velar
2 = labiodental	5 = alveopalatal	8 = glottal
3 = dental	6 = palatal	

Examples of English consonants

p	<u>p</u> it, <u>p</u> aper, <u>c</u> ap
b	<u>b</u> ad, <u>b</u> aby, <u>c</u> ab
t	<u>t</u> op, <u>t</u> ee <u>t</u> h, <u>c</u> ot
d	<u>d</u> o, <u>b</u> ending, <u>c</u> andied
k	<u>c</u> ot, <u>c</u> ap, <u>k</u> ick
g	<u>g</u> o, <u>f</u> inger, <u>f</u> og
č	<u>ch</u> urch, <u>ch</u> ip, <u>ca</u> ch
ǰ	<u>j</u> ump, <u>l</u> egion, <u>f</u> udge
f	<u>f</u> oot, <u>ph</u> one, <u>cough</u>
v	<u>v</u> eal, <u>f</u> ever, <u>l</u> ea <u>v</u> e
θ	<u>th</u> ick, <u>eth</u> er, <u>te</u> eth

ð	the, father, bathe
s	soap, recent, face
z	zoo, razor, goes
ʃ	shoe, wish, ration
ʒ	rouge, measure
m	money, mink, mop
n	no, many, man
ŋ	ring, think, singer
l	leave, lily, call
r	rope, mary, car
w	win, rowing
y	yes, yellow

Syllabic consonants

ɫ	bottle, fiddle
ɾ	bird, paper
ɱ	bottom
ɳ	button

Diacritic symbols

ˈ or 'cv	before syllable indicates stress, e.g. bútter (or) 'butter
̃	nasal vowel
vː or vˑ	long vowel
̥	short vowel
ç	voiceless consonant (used in some cases where a voiced consonant is only partially voiced)
c ^h or c ^ʰ	aspirated consonant
ç	retroflexed consonant
c ⁼	unaspirated consonant

Phonological symbols

C	consonant
V	vowel
[]	phonetic transcription
/ /	phonemic transcription, i.e. a sound unit that enters into contrast with others within the linguistic system

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A linguistic approach

1.1 A growing interest in linguistics

In recent years there has been a growing emphasis on the role of linguistics in the field of language disorders in children. This phenomenon can partially be related to two recent developments in linguistics. The first of these is the appearance of transformational grammar with the publication of Noam Chomsky's *Syntactic structures* in 1957. This theory has provided an elegant and perceptive approach to language as well as powerful descriptive devices (e.g. transformations in the domain of syntax and distinctive features in phonology). Further, transformational grammar's emphasis on the need for linguistic theory to explain how children acquire linguistic structures has led to a renewed interest in language acquisition in children.

Both of these trends provide important new information in the area of language pathology. When confronted with children with language disorders, there is a need for a method of describing the child's linguistic system. This descriptive method must be effective in demonstrating the child's system of rules, and the complexity of the structures that are acquired. Some linguists feel that transformational grammar is a major step in this direction. When training children with language problems, it is also necessary to understand the general characteristics of the acquisition process. That is, one needs to know the various stages of language acquisition, on both general and specific topics, in order to determine any child's particular stage of arrest. Once determined, it is possible to see how far the child still needs to advance. Although these are worthy goals, it is not always clear to what extent each of these possible contributions has been incorporated directly into clinical application. To the working clinician, modern linguistics, especially transformational grammar, often appears to be a very theoretical and controversial approach to language. Since most linguists have not been concerned with matters of application they consequently have not made the appropriate adjustments to the theory. Also, those people who have attempted to make such modifications have often neglected the fact that others do not have the same experience in using linguistic methods of analysis. Their treatments are often advanced and outside the training of many clinicians. Lastly, it is not clear that many of the aspects of modern theory have direct clinical relevance, so that a realistic set of goals still needs to be established.

In terms of language acquisition in normal children, the same situation has developed to some extent. The claim is made that data on normal children can be

invaluable to clinical work, yet a number of important questions remain to be answered. For example, although information is available on several aspects of normal language acquisition, it is generally not in a form that is readily adaptable for clinical evaluation and programming. Here, additional factors need to be considered, such as what to teach, how much, when, and how. The data on normal children are just a first step in such cases. Also, there is the ever-present question of the extent to which children with language disabilities follow the normal pattern. It may be that there are certain specific differences within individual disorders that will determine greatly how training should proceed.

These problems are particularly evident in the area of phonological disabilities in children. In the last few years there have been several articles discussing the value of generative (or transformational) approaches to phonological disability. The authors usually claim that they are providing an effective means to describe the phonological patterns of deviant children. Also, they claim that these descriptive devices, e.g. recent suggestions for the use of distinctive features, have therapeutic value. However, because of the assumptions made about the reader's linguistic background, these articles are often not understood by those concerned primarily with a clinical application. So, too, the conclusions drawn by the authors are often more theoretical than practical in scope. The result has been a rather negligible influence on most clinical practices.

To some extent, the same thing can be said about the use of data from normal children's phonological development. Apart from data on age norms for the appearance of particular sounds (e.g. Templin 1957), most normal data have not been adapted to clinical use. Often the information in diary studies is too sketchy or too detailed to provide a reasonable survey of the acquisition process. Other works often remain too theoretical or restricted in scope to provide information for application.

There is a tremendous need for a work which attempts to solve some of these problems. This is the general goal of this book. It approaches the topic of phonological disability from both the perspectives mentioned. In terms of phonological theory, it outlines those aspects of generative transformational theory that have direct clinical relevance. In doing so, a minimum of assumptions are made about the linguistic training of the reader. It is written for the language clinician who wishes to know how to better record, analyse, and programme the language of his or her children. In the process, data from normal as well as disabled children is presented and discussed to show how normal data may be used to improve clinical work with children.

1.2 The historical perspective

It is useful at the onset to take a brief look at the historical developments that have led to the existence of these two areas of information, i.e. phonological theory and data on normal children's phonological development.

1.21 Phonological theory

In terms of phonological theory, there are many alternative ways to look at the sound patterns of languages, and these alternatives vary considerably in the degree of support they receive from linguists throughout the world. For our purposes, two approaches are worth mentioning. The first approach is often called *taxonomic phonemics*, a term used to refer to a variety of approaches used extensively throughout the 1940s and 1950s. This approach is concerned with specifying the way languages use contrast to distinguish meanings in language. For example, English has /p/ and /b/ as contrasting sound units or *phonemes*, because the use of one or the other will cause a difference in meaning, e.g. *pit* versus *bit*. Relying on this principle, the area of taxonomic phonemics developed a number of assumptions about language and its analysis. The term 'taxonomic' is used because of the emphasis on classification.

With the advent of transformational grammar in the 1950s (also referred to as 'generative grammar'), a new approach to phonology was developed. This has come to be known as *generative phonology*, which differs from taxonomic phonemics in many ways. It was developed most extensively by the American linguists Noam Chomsky and Morris Halle, who in 1968 published the most extensive explanation yet of this theory in *The sound pattern of English*. Although this book was produced as a progress report on the state of the theory at that time, it still remains the primary source of information on it. Unfortunately, because it is a very difficult book to read, containing some unusual ideas about the nature of English phonology, some misunderstandings have arisen concerning the claims and value of generative phonology. A simpler and clearer treatment of the theory has been written by Schane (1973). This is a relatively useful introduction to the area of generative phonology, and should produce a wider understanding of its nature.

Although the details of the nature of generative phonology are outside the purpose of this book, at least two aspects deserve mention here. One of these concerns the use of *features* in describing language, i.e. the practice of breaking sounds down into their various parts. For example, the generative phonologist does not refer to a sound such as [b] as simply one unit, but rather one that can be further divided into features such as [+ stop], [+ labial], [+ voiced] etc. This practice has been carried over into a variety of studies with both deviant and normal children. A second point concerns the various *formal devices* this theory uses to describe the sound patterns of language. These include restrictions on how rules are written and the ways that rules may follow one another. These formal devices are commonly encountered in recent articles in speech journals on the application of generative phonology.

These two developments in phonological theory, taxonomic phonemics and generative phonology, have each had an influence on theories of child phonology. A theory of child phonology that in some ways grew out of taxonomic phonemics is that of Jakobson (1968), entitled *Child language, aphasia, and phonological universals*. This short book, which is actually a translation of a much earlier original in German, presents one of the most powerful theories of child phonology