

Psycholinguistics

Learning and Using Language

Insup Taylor
with M. Martin Taylor

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PSYCHOLINGUISTICS

Learning and Using Language

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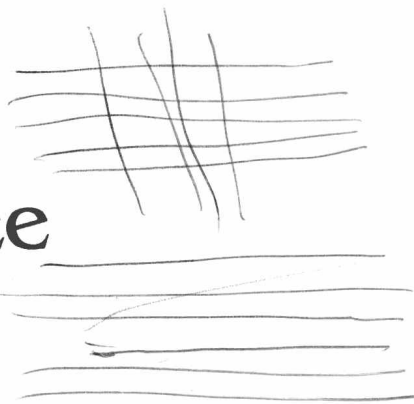
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For those non-native English speakers who, like me, have taken on the challenge of mastering the English language in all its beauty, variety, subtlety, and complexity.

ABOUT THE AUTHORS

Insup Taylor obtained her B.A. at Seoul National University, M.A. and Ph.D. at Johns Hopkins University, all in psychology. She is the project director of McLuhan—Nanjing Cooperative Project on Literacy. Her publications include: *Introduction to Psycholinguistics*, *The Psychology of Reading*, with M. M. Taylor, and *Scripts and Reading* (edited with D. R. Olson, in preparation).

M. Martin Taylor obtained his B.A.Sc. in engineering physics at University of Toronto, M.S.E. in industrial engineering at Johns Hopkins University, and Ph.D. in psychology at Johns Hopkins University. He has published in a wide range of topics in psychology and computer science. He edited *The Structure of Multimodal Dialogue*, with F. Néel and D.G. Bouwhuis, and co-authored *The Psychology of Reading*, with Insup Taylor.



Preface

This book introduces psycholinguistics to undergraduates in diverse disciplines — psychology, linguistics, language teaching, computer science, speech pathology, and so on — who are interested in the question, How do people learn and use language to communicate ideas?

As a practicing ~~psychologist~~ linguist, I strive to write sentences and passages that are readable. I preached on this topic in *The Psychology of Reading* (chaps. 12 and 13 of Taylor and Taylor, 1983), and to a lesser degree, I do so in the present book (chaps. 3–5).

That writer does the most who gives his reader the most knowledge, and takes from him the least time. [C. C. Colton, 1780–1832]

One of the central concerns in psycholinguistics is whether learning and using language follows a universal pattern, despite surface differences among languages. As a multilingual who is familiar with several languages, especially some that differ drastically from English, I am able to use evidence from diverse languages to illuminate almost every major topic. After all, psycholinguistics is not about the English language alone but about language in general.

The book covers a wide range of topics. In addition to such traditional topics as meaning, speech perception, comprehension, production, and language acquisition, it covers such nontraditional yet important topics as bilingual language processing and cortical processing of language. The book accords prominence to use of language in discourse, such as conversation, story, and written text. Indeed, conversation is the *raison d'être* for language itself. Also covered are reading and writing, which are as much language behaviors as are speaking and listening.

Because of its wide range of topics, multilingual perspective, and numerous and up-to-date references, the book may be of some value to researchers as well as students.

The topics and their organization in the book are described in "What Is Psycholinguistics?" and "About This Book: Organization" (chap. 1). Briefly, chapter 1 and the six chapters of part I, "Basic Psycholinguistics," describe language(s) and its use by normal adults; the three chapters of part II, "Developmental Psycholinguistics," describe how language(s) is acquired by children; and the two chapters of part III, "Applied Psycholinguistics," describe how language(s) is learned and used by bilinguals and how it is impaired by brain damage.

Together, these three parts in twelve chapters (including the introduction) develop the theme that a language is for communicating ideas from one mind to another.

Undergraduates who enroll in a psycholinguistics course usually have taken introductory psychology or introductory linguistics, but not necessarily both. Accordingly, I take the following measures.

Technical terms are used only when they are indispensable. When used, I make them easy to locate, grasp, and remember by setting them in **boldface** where they are defined and by defining them clearly and concisely, in the context of supporting information. Most of these technical terms are listed also in the Glossary and Subject Index.

The following items are provided in every chapter:

- For a complex topic, an overview section
- One or more themes or central issues in a few sentences
- One or more boxes, each containing an anecdote or illustrative sample — amusing, striking, or interesting — that is related to the topic under discussion, though not crucially
- Abundant tables and figures
- A brief section, "Useful References," that lists a few of the journals as well as readable and recent monographs that are relevant to the chapter
- A detailed outline of each chapter, which lists all the headings of the chapter, organized in a hierarchy of two levels.

The book was authored mainly by I. Taylor, with contributions in various places from M. M. Taylor, mostly in the areas of dialogue and of computer-related topics. He also read each chapter of the book several times in different stages of writing and provided many substantive comments, some of which were used in the book and some of which were not. The "I" of the book is always I.T.

ACKNOWLEDGMENTS

I now list several colleagues who were generous enough to read one or more chapters and offer helpful comments and sharp eyes for misprints.

Joyce van de Vegte (Defense and Civil Institute of Environmental Medicine) read the entire manuscript.

The first five chapters of part I were read by Danny D. Steinberg (Rikkyo University, Tokyo). Chapter 7, on speech sounds, was read by Melvyn Hunt (Marconi Space and Defense Systems, Portsmouth, England).

The three chapters of part II, "Developmental Psycholinguistics," have been read by Jeremy Anglin (University of Waterloo), Robin Campbell (University of Sterling), Guy Ewing (Parkdale Project Read, Toronto), P. G. Patel (University of Ottawa), and Gordon Wells (Ontario Institute of Studies in Education).

Chapter 9, "Bilingual Language Processing," was read by Jyotsna Vaid (A&M Texas University), and Alain Desroschers (University of Ottawa).

I also wish to thank the following Prentice Hall reviewers for their valuable assistance in reviewing the manuscript for this book: William Cooper (Tulane University) and Richard Gerrig (Yale University).

Finally, David Olson and Sylvia Wookey provided me with a cozy office.

So thank you all; I just hope the book is worthy of your support.

I.T.
Toronto

PSYCHOLINGUISTICS

Contents

PREFACE

ix

1 PSYCHOLOGY AND LANGUAGE

1

- Psycholinguistics 2
- Human Language: Its Characteristics 5
- Languages of the World 11
- Languages and World Views 15
- Cognitive Processes 19
- Summary and Conclusions 25

PART I: BASIC PSYCHOLINGUISTICS

2 DISCOURSE: FORMS AND FUNCTIONS

27

- Conversation: Competence, Maxims, and Rules 28
- Speech Acts 32
- Conversational Exchange 36
- Interactive Speech: Turn Taking 39
- Speech Formulated on the Spot 41
- Structure and Coherence in Conversation 47
- Summary and Conclusions 51

3 DISCOURSE: COMPREHENSION AND MEMORY

52

- Comprehension: Overview 53
- Coherence and Comprehension 56
- Idea Units and Levels of Importance 63
- Knowledge and Context 66
- Figurative Language and Indirect Speech 70
- Mental Representation 75
- Summary and Conclusions 80

4	SENTENCE: BASIC SYNTAX AND PRODUCTION	82
	Sentence Processing: Overview 83	
	Grammatical Classes of Words 85	
	Sentence Structure 91	
	Sentence Production 98	
	Conceiving Content 99	
	Formulating Syntactic Structure 107	
	Models of Sentence Production 112	
	Summary and Conclusions 114	
5	SENTENCE: COMPREHENSION AND MEMORY	116
	Processing Units 117	
	Case-Role Assignment and S-V Processing 120	
	Structurally Related Sentences 123	
	Pragmatic and Semantic Factors in Comprehension 127	
	Parsing Strategies 131	
	Comprehension Models: Autonomous versus Interactive Processing 135	
	Summary and Conclusions 143	
6	WORDS: MEANING, MEMORY, AND RECOGNITION	145
	Word and Morpheme as Units 146	
	Categories of Objects 153	
	Word Meaning Decomposed 156	
	Word Meaning in Context 166	
	Semantic Memory 170	
	Visual Word Recognition 174	
	Summary and Conclusions 180	
7	SPEECH SOUND: ARTICULATION AND PERCEPTION	182
	Phonetic Symbols and Phonemes 183	
	Articulation 186	
	Syllables and Suprasegmental Features 192	

Articulatory Effort and Errors	195
Acoustics of Speech Sounds	198
Perception of Phonemes	206
How to Wreck a Nice Beach = How to Recognize Speech	211
Models of Word Recognition by Man and Machine	216
Summary and Conclusions	222

PART II: DEVELOPMENTAL PSYCHOLINGUISTICS

8 GETTING STARTED AND PHONOLOGICAL DEVELOPMENT 225

Preliminaries to Developmental Psycholinguistics	227
Child's Mind and Mother	230
Phonological Development	240
Critical Period(s) for Language Acquisition	248
Summary and Conclusions	250

9 DEVELOPMENT OF SEMANTIC AND DISCOURSE SKILLS 253

One-Word Utterance	255
Learning Words and Their Meanings	260
Later Semantic Development	267
Development of Discourse Skills	276
Beginning Reading	284
Summary and Conclusions	287

10 SYNTACTIC DEVELOPMENT 289

Two-Word Combinations	292
Development of Grammatical Morphemes and Categories	295
Development of Sentence Structures	303
Development of Sentence Comprehension	309
Theories of Language Acquisition	320
Summary and Conclusions	323

PART III: APPLIED PSYCHOLINGUISTICS

11	BILINGUAL LANGUAGE PROCESSING	326
	Early Bilingualism	329
	Bilingual Schooling	338
	Language Learning in Adolescence and Adulthood	344
	Bilingual Information Processing	348
	Bilingual Semantic Memory	353
	Summary and Conclusions	359
12	LANGUAGE AND BRAIN	362
	Left Hemisphere versus Right Hemisphere	366
	Aphasia and Alexia: Neurological Studies	377
	Aphasia and Acquired Dyslexia: Psycholinguistic Studies	384
	Neurolinguistic Models	389
	Summary and Conclusions	392
	EPILOGUE	395
	REFERENCES	397
	GLOSSARY	439
	INDEX	459

- 1 -

Psychology and Languages

Psycholinguistics

- What Is Psycholinguistics?

- About this Book: Organization

- About this Book: Approach

Human Language: Its Characteristics

- Spoken and Written Language

- Human Language versus Animal Communication

- Teaching Human Language to Apes and Dolphins

Languages of the World

- English Dialects

- Language Families

Languages and World Views

- Differences in Categories and Labels

- Grammatical Features and Thinking

- Universal Perceptual Pattern

Cognitive Processes

- Computers in Psycholinguistics: Overview

- Memory Processes

- Knowledge Structure

- Parallel Distributed Processing

Summary and Conclusions

- Useful References

The essence of language is human activity — activity on the part of one individual to make himself understood by another, and activity of that other to understand what was in the mind of the first.

OTTO JESPERSEN, 1924, p. 17*

This book is about how people learn and use language to communicate ideas and needs, as the great Danish linguist Otto Jespersen said so long ago (the epigraph to this chapter).

This introductory chapter tries to answer several questions that students might ask before taking a course in psycholinguistics.

What is psycholinguistics, and what kind of a book is this? In addition to the standard questions, the chapter asks questions such as:

What characterizes human language, and how does it differ from animal communication? How do the languages of the world differ, and how do these differences influence the way people think? The answers introduce the students to the nature and diversity of languages. What are cognitive processes? Answers to this question are essential, because cognitive processes enable people to learn and use language. Indeed, understanding, remembering, and producing language are cognitive processes.

Goal: To prepare students for this book on psycholinguistics by describing the nature of human language and the cognitive processes involved in learning and using language.

PSYCHOLINGUISTICS

What Is Psycholinguistics?

Psycholinguistics, as the term indicates, is a marriage of psychology and linguistics, though not necessarily as equal partners; psychology is the dominant partner in this book.

Linguistics studies language as a formal system. Its three main branches are **phonology**, the study of speech sounds and their patterns; **semantics**, the study of meaning; **syntax**, the study of sentence structure; and **morphology**, the study of words and word formation. Sometimes morphology and syntax are combined as **morphosyntax**. Linguists establish units of language; they search for rules that organize sounds into words, words into sentences, and possibly sentences into discourse; and they establish language families.

The contemporary linguist Chomsky (1970) distinguished between **competence**, the idealized knowledge a speaker or hearer has of a particular

* Printed by permission of Unwin Hyman.

language system, and **performance**, the actual use to which a speaker-hearer puts his competence.* The linguist studies competence by **formalizing** (making explicit as a set of rules) what people implicitly know about their native language. Later Chomsky (1986) distinguished I-language (inner language, the system of linguistic knowledge attained) and E-language (external language, language as an externalized object). The linguist's main tool of inquiry is the intuition of a native speaker, often the linguist himself, about his language.

Psycholinguistics is the study of language behavior: how real (rather than ideal) people learn and use language to communicate ideas. Psycholinguists ask questions such as, How is language produced, perceived, comprehended, and remembered? How is it used for different communicative purposes? How is it acquired? How does it go wrong? How is it represented in the mind?

Sometimes psycholinguists observe people in natural settings. For example, they may record the language development of one child over a period of, say, four years. More often, they experiment: they might require groups of **subjects** (too often undergraduate volunteers) to listen, read, or remember **stimuli**, such as a set of sentences that might vary in length, meaningfulness, structural complexity, or communicative function. Experimenters might measure the subjects' response time and/or accuracy. This book discusses countless experiments, some briefly, some extensively.

Some of the topics discussed in this book, especially in chapter 2, are studied in an interdisciplinary inquiry called **pragmatics**, which in linguistics "tended [formerly] to be treated as a rag-bag into which recalcitrant data could be conveniently stuffed, and where it could be equally conveniently forgotten" (Leech 1983, p. x). No longer. Today, pragmatics is considered worthy of systematic study. It examines the use of language as distinct from, and complementary to, language seen as a formal system. In this book, **pragmatics** refers to the study of how people produce and interpret language using knowledge of the world, and in context — situational, interpersonal, and linguistic. So defined, pragmatics is eminently a topic in psycholinguistics. Indeed, in this book, pragmatics plays a role as important as, or — dare I say — even more important than, other components of linguistics, namely, syntax, semantics, and phonology.

About This Book: Organization

To develop the theme of the book — language is for communicating ideas from one active mind to another — several important topics are chosen and organized into three parts and eleven chapters that follow the present introductory chapter.

The three parts of the book are basic, developmental, and applied

* Either a masculine or feminine pronoun will be consistently used within each paragraph.

psycholinguistics. Part I, **Basic Psycholinguistics**, is basic in three senses: (1) it describes the basic units of language; (2) it describes the basic **psycholinguistic processes** of producing, perceiving, comprehending, and remembering linguistic items by normal adults; and (3) it forms the basis for parts II and III. Two branches of psycholinguistics — developmental and applied — build on basic psycholinguistics; they in turn contribute to building well-rounded basic psycholinguistics.

Part I, by far the largest of the three parts, consists of six chapters that deal with four basic units of language: two chapters each on discourse and sentence, and one chapter each on word and speech sound. All four units — discourse, sentence, word, and speech sounds — are of course jointly involved every time language is used, as attested by frequent cross references among the chapters. Nevertheless, the four are discussed in separate chapters for convenience: each unit requires specialized terms, concepts, and analyses that can be most efficiently discussed together within one or two chapters.

Language is used in discourse, which may be conversation, stories, written texts, and the like (chaps. 2 and 3). Discourse consists of a sequence of sentences and clauses (chaps. 4 and 5). A sentence, in turn, is made up of words and word parts that carry meanings (chap. 6). Finally, a spoken word is made up of speech sounds arranged in a pattern, colored by tone of voice (chap. 7). With each of these four topics — discourse, sentence, word, and sound — I first describe briefly the linguistic terms and concepts needed and then describe extensively observational and research data on how the unit is processed by normal adults.

Part II, **Developmental Psycholinguistics**, discusses, in three chapters, how children acquire language and communicative skills, from birth to the teen years, but especially between ages 2 and 5. Chapter 8 provides some preliminaries to part II (e.g., overview, methods of study) and describes phonological development. Chapter 9 covers the development of semantic and discourse skills as well as learning to read. Chapter 10 traces morphosyntactic development, starting with two-word combinations and culminating in multiclausal sentences.

In order to draw a full picture of language acquisition, one must learn something about how children acquire two or more languages. This topic might well have been included in part II. But then, adults too may learn to speak new languages. In a bow to a fledgling tradition, I have relegated bilingual language processing (chap. 11) to part III, **Applied Psycholinguistics**, which includes also chapter 12 on neural mechanisms that underly impaired as well as intact language use, otherwise known as **neurolinguistics** (neurology and linguistics).

Reading — how adults read and children learn to read — is another applied topic. Rather than having its own chapter, it is incorporated into almost all the chapters of the book. Also incorporated in other chapters (especially 2, 9, and 11) is **sociolinguistics**, the study of language behavior in

social interaction, or of the relation between language and society. The use of computers in language processing is yet another applied topic that is incorporated into several chapters.

Finally, an epilogue reasserts the theme of the book: language is for communicating ideas from one mind to another.

About This Book: Approach

In dealing with each major topic in psycholinguistics, as in any science, two approaches may be distinguished: theory to data and data to theory. In a **theory-to-data approach**, the scientist starts with one theory or a few competing theories and marshals experimental data that test the one theory or discriminate among the competing theories. In a **data-to-theory approach**, the scientist or writer presents data and then proposes one theory or a few competing theories that might explain the given data.

I tend to take the data-to-theory approach in this introductory book, whose main objective is to inform rather than to argue. In doing so, I usually confine theories to a section of their own so that the research findings can remain relatively intact, even if the theories that predict or explain them change or become obsolete after the book is published. (Any field of inquiry is littered with abandoned theories!) This book discusses not only theories but also **models**, which appear to be similar to theories in functions but are more modest in their scope and claim. The word *model* also has the meaning "analogy," for instance, a claim that a computer serves as a model of human information processing ("Computers in Psycholinguistics: Overview," below).

Many models and theories start out diametrically opposed to each other: top down versus bottom up; wholistic versus analytic; modular versus interactive; innatism versus empiricism, and so on. Data can be obtained supporting one or the other model or theory, depending partly on the kinds of experimental stimuli and procedures used. When the dust settles down, however, there usually emerges a compromise. The human is a flexible and versatile language learner and user whose behaviors can be explained, under different conditions, by each of the two (or more) competing models or theories.

HUMAN LANGUAGE: ITS CHARACTERISTICS

Before probing psycholinguistic processes, we need some understanding of languages — their nature, functions, and diversity.

A language is a system of signs (e.g., speech sounds, hand gestures, letters) used to communicate messages. Of all kinds of languages, the most developed, used, and studied is undoubtedly human spoken language. It has evolved to allow people to communicate efficiently. Let us examine some of its