FOURTH EDITION

A Concise Introduction to Linguistics

BRUCE M. ROWE

DIANE P. LEVINE

Fourth Edition

A Concise Introduction to Linguistics

Bruce M. Rowe

Los Angeles Pierce College

Diane P. Levine

Los Angeles Pierce College

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published 2015, 2012, 2009, 2006 by Pearson Education, Inc.

Published 2016 by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN
711 Third Avenue, New York, NY 10017, USA

Routledge is an imprint of the Taylor & Francis Group, an informa business

ISBN: 9780133811216 (pbk)

Library of Congress Cataloging-in-Publication Data

Rowe, Bruce M.
A Concise Introduction to Linguistics / Bruce M. Rowe, Los Angeles Pierce College; Diane P. Levine, Los Angeles Pierce College. — Fourth Edition.
pages cm
Includes index.
ISBN 978-0-13-381121-6
1. Linguistics. I. Levine, Diane P. II. Title.
P121.R6926 2014
410—dc23

2014009620

DEDICATION

This book is dedicated to our families:
Christine, Aaron, and Andrew Rowe
Brian, Kevin, and Samantha Levine; Heidi, Theo, and Lucy Sturm

This page intentionally left blank

CONTENTS

This page intentionally left blank

PREFACE

Why We Wrote This Book

Linguistics courses are taught in several academic departments, including linguistics, English, and anthropology. In addition, students with majors other than linguistics, English, and anthropology might be required to take an introductory course in linguistics. These majors include communications, education, journalism, sociology, and deaf studies. Moreover, an introductory linguistics course often fulfills a general liberal arts requirement. Most linguistics books on the market are directed specifically to linguistics, English, or anthropology majors. Also, most linguistics texts reflect the research interests and theoretic stance of the author or authors. We have attempted to write an introductory text that covers the core topics of linguistics and provides the information and concepts that will allow students to understand more detailed and advanced treatments of linguistics, should they pursue the field further. In other words, our book is written with the general education student in mind, but it also provides the linguistics, English, and anthropology major with the resources needed to succeed in the next level of courses. The authors are anthropologists and have included numerous cross-cultural examples relevant to each of the topics covered.

We have written this book in a manner that does not assume previous knowledge of linguistics on the part of the student. We explain all concepts in a systematic way assisted by numerous pedagogical aids. We attempt to make complex linguistic topics as easy to learn as possible.

Features of the Book

The book includes numerous pedagogical aids:

Learning objectives: These learning objectives provided for each chapter help the student to know in advance of reading the chapter what concepts to keep in mind as they read a chapter. The student should be able to carry out the objective after reading the chapter.

Numerous exercises and study questions: Short sections (usually three to seven pages) of each chapter are followed by exercises and/or study questions on that section. This helps the student to understand one subject before moving on to the next. Most other books have all of their exercises at the ends of the chapters.

Suggested reading at the end of each chapter: Because this is a "concise" introduction to the topic, we provide more sources for further reading than most books. If students want to learn more about a topic that has been introduced briefly, they can use one or more of the sources provided. The sources might also be useful to a student required to write a paper for the course. We added new "Suggested Readings" to the fourth edition.

Chapter summaries: Each chapter concludes with a chapter summary. The summary gives a concise overview of the contents of the chapter.

In-margin running glossary and an end-of-the-book glossary: Using the in-margin running glossary, students can quickly check the definitions of terms they read in the text. In the end-of-the-book glossary, students can check the definition of a concept they have read earlier if they do not remember the chapter in which it was first used.

Cross-cultural examples: We have numerous cross-cultural examples. As we explain concepts of importance to all students of language, we draw upon examples from

around the world. Chapters 6, 7, 8, and 12 cover topics of primary interest to linguistic anthropologists.

Instructor's Manual with Tests: The author-written test bank features nearly a thousand test questions in four question types—multiple-choice, true/false, matching, and essay. The fourth edition includes new questions on all new sections of the text. The answers to all of the exercises that are not answered in the text or in Ap-pendix B are provided to instructors in the test bank. Please visit the companion website at www.routledge.com/9780133811216.

New to This Edition here. The following is a chapter-by-chapter list of the major changes made in the fourth edition.

- Chapter 1 includes a new introduction that discusses the different subfields of linguistics.
- In Chapter 2, there is an expanded coverage of schwa and an added section on r-coloring of a vowel.
- In Chapter 3, we have made some additions and changes to the section on distinctive features.
- In Chapter 4, the section on lexical categories has been reworked and is now presented in a table.
- Chapter 5 has been reorganized so that the "Grammaticality Judgments and Ambiguity" section has been moved from the middle of the chapter to the end of the chapter to provide better flow of topics. The phrase structure rules and tree diagrams have been revised to be more compatible with each other and more consistent with modern generative grammar; the definition of predicate has been updated and refined; a diagram has been added to the box on recursion; and there have been many other smaller changes to the chapter. An alternative to generative grammar (cognitive-functional linguistics), especially in terms of the concept of a universal language acquisition device has been noted and the reader is referred to Chapter 8 where this alternative is discussed.
- In Chapter 6, the concept called "The Force of Language" has been added, as well as the concept of the ordering of an utterance and the use of silence in Samoa. We also provide an additional example for the maxim of quantity and further explanation of the Japanese concept of *enryo*.
- A new box (Box 7-1) has been added to Chapter 7. It examines the questions of how many dialects there are in a language. Also, information on Light Warlpiri and the unique process that lead to its development are included in the chapter. We have also added additional examples in the section on the Sapir-Whorf hypothesis. There is a new section on "mock" languages. There is new information on the attempt to save endangered languages with Mayan being used as one of the main examples.
- In Chapter 8, there is new information on language and the brain. The section on "The Poverty of the Stimulus" has been rewritten and expanded. Information on cognitive-functional linguistics has been added and discussed in relationship to the controversy over whether there is a dedicated area of the brain involved in language acquisition (a language acquisition device), or if language acquisition is the result of more general cognitive processes.
- Minor changes have been made to Chapter 9.
- In Chapter 10, we have clarified the differences between the terms *homograph*, *homophone, homonym*, and *heteronym* by adding a chart on the topic; revised some of the figures dealing with the section "Ancient and Modern Scripts"; added some material to the section on the printing press and to the section on the significances of computers to modern human mass communication in the section called "A Few Words about Computer."

- A new box on whistle "languages" was added to Chapter 11.
- In Chapter 12, we have added some new information on how some classes of words are more conservative than other classes in terms of change and replacement over time. We also added some information on how storytelling in the Zapotec language is helping to preserve this Latin American language.

Acknowledgments

We would like to thank Professors Philip L. Stein, Darlene K. Wittman, Cynthia L. Herbst, and Richard J. Follett of Los Angeles Pierce College for reading various sections of the manuscript. Especially, we would like to acknowledge Salpi Vartivarian, adjunct lecturer at Los Angeles Pierce College for her valuable comments on the manuscript for the fourth edition of the book.

We would also like to thank the following people who reviewed the entire manuscript for the first edition:

Karen Dykstra, Eastern Michigan University
James G. Flanagan, University of Southern Mississippi
Elizabeth Fortenbery, Tacoma Community College
Paul B. Garrett, Temple University
Daniel Lefkowitz, University of Virginia
Rod Moore, Los Angeles Valley College
Claiborne Rice, University of Louisiana at Lafayette
David Samuels, University of Massachusetts
Lynn Thomas, Pomona College

Our appreciation is extended to the reviewers of the second edition:

Monica L. Bellas, Cerritos College
Sheikh Umarr Kamarah, Virginia State University
Donna L. Lillian, East Carolina University
Carol Moder, Oklahoma State University
Stephanie Schlitz, Bloomsburg University
Marit Vamarasi, Northeastern Illinois University
Cynthia Vigliotti, Youngstown State University
Penglin Wang, Central Washington University

We would like to thank the people who reviewed the third edition:

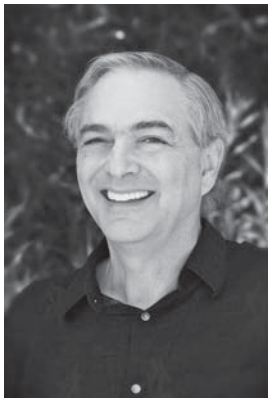
Dorothy Wills, California Polytechnic University–Pomona
Lee Bickmore, University of Albany
Stephen Tyler, Rice University

We would like to thank the reviewers of the fourth edition:

Netta Avineri, Visiting Professor of Applied Linguistics at the Monterey Institute of International Studies
Edward Callary, Northern Illinois University
Paul McDowell, Santa Barbara City College
Salpi Vartivarian, Pierce College

We would also like to acknowledge the contribution of numerous students, who over the years have made useful suggestions on both written material and lectures. Special thanks go to Sheila Kurland who proofread most of the manuscript. We would like to give special thanks to Christine L. Rowe for proofreading early drafts of this manuscript and to Jan Scopatz for typing an early version.

ABOUT THE AUTHORS



Bruce M. Rowe is a professor emeritus of anthropology at Los Angeles Pierce College, where he has taught since 1970. He designed the college's first linguistics course for students majoring or minoring in linguistics, anthropology, education, English, interpreting for the deaf, and communications studies, and for those fulfilling a general education requirement. Professor Rowe also teaches physical and cultural anthropology as well as sociology. In addition to *A Concise Introduction to Linguistics*, he has co-authored eleven editions of *Physical Anthropology,* two editions of *Physical Anthropology: The Core,* and physical anthropology study guides and workbooks (all with Philip L. Stein). Professor Rowe has authored four editions of *The College Survival Guide: Hints and References to Aid College Students* and *The College Awareness Guide: What Students Need to Know to Succeed in College*. He has received numerous awards for teaching. He has been a fellow of the American Anthropological Association, a member of the American Association of Physical Anthropologists, the Society for Anthropology in Community Colleges, and the Linguistic Society of America.

Diane P. Levine is a professor emerita of anthropology at Los Angeles Pierce College, where she has taught cultural and physical anthropology, as well as linguistics. She was the chair of the Department of Anthropological and Geographical Sciences. As a former teacher of English and ESL, she has written articles on the use of literature in the ESL classroom, and presented seminars on critical thinking in the language arts classroom. Professor Levine is on the advisory board for *Annual Editions: Anthropology* and was also a national advisor for the Emmy Award-winning film series *Cultural Anthropology: Our Diverse World*. She is a member of the American Anthropological Association and the Society for Anthropology in Community Colleges.

CHAPTER 1

Introduction: The Nature of Communication

LEARNING OBJECTIVES

- **Explain the difference in the meaning of the words *communication* and *language*.**
- **Recognize that language is rule-governed and explain this fact.**
- **Compare the differences between linguistic competence and linguistic performance.**
- **Analyze the statement: "Language is not dependent on hearing or on speech."**
- **Describe the ways that nonhuman communication systems differ from language.**
- **Explain the statement: "Human communication is like an elaborate dance."**
- **Construct a chart or a list that explains why most linguists believe that apes, such as Washoe and Koko, are not fully displaying human language abilities.**

Linguistics is the scientific study of any aspect of language. Since language is a human universal, all academic fields that study humans have an interest in language. In general, a linguist might study the rules by which linguistic elements are formed, that is, grammar (Chapters 4 and 5); how linguistic elements carry meaning (semantics and related studies, Chapter 6); and how language context influences and shapes meaning (pragmatics and related fields, Chapter 6).

Many animals are social animals—that is, they live in groups. Language expands the human capability for social interaction beyond that of other social animals. Because language is so important to social interaction, over the years some sociologists, anthropologists, psychologists, and others who study human behavior have synthesized their studies with linguistic knowledge and created the fields of sociolinguistics (the first part of Chapter 7), linguistic anthropology (the second part of Chapter 7), and psycholinguistics.

Since the potential for language is ultimately a biological potential, linguistics has become important in biology. Neurolinguistics deals with the parts of the brain that allow for language to be acquired, developed, and be used (Chapter 8). Evolutionary linguistics deals with how that potential might have originated and evolved in the human species (covered in several chapters). Clinical linguistics deals with helping people with language pathologies.

Historical linguistic studies language change and the historical relationship between languages (Chapter 12). There are also many areas of what is called applied linguistics. Applied linguists uses knowledge gained from linguistics to help people learn languages and to aid people in language related issues of everyday life.

They can have careers as foreign language or second language teachers, interpreters/translators, dialect coaches, and in many other areas.

In addition to these different areas of linguistic study (and the above listing is not complete) there are also many different theoretical approaches to linguistic topics. For instance, there are many ways to analyze grammar. This book is a brief introduction to linguistics and we will only skim the surface of the complex and varied field of linguistics. You can read additional general information about linguistics on the Linguistics Society of America's website at: http://www.linguisticsociety.org/.

The Nature of Communication

A male firefly moves through the evening air flashing a distinctive signal. A female sailing over the meadow responds with a brief flash. The male alights and mating occurs.

A foraging robin spots an owl. Immediately the robin produces a sharp call that sounds like "chink." Other birds in the area are alerted by this vocalization; the predator has lost the element of surprise.

A young, lost monkey continually produces squeaks, screams, and "rrah"-sounding calls. The racket attracts the attention of the infant's mother. They are reunited.

Broadly smiling, a college student returns home. "I got an A on my linguistics midterm; can you believe it?" The parents respond, "It's hard to believe, but we have never known you to lie."

Communication is behavior that affects the behavior of others by the transmission of information.

Communication is behavior that affects the behavior of others by the transmission of information. When an organism or machine communicates, it sends messages about itself or its environment. The result of communication is change. The monkey changed a potentially dangerous situation into a secure one; the student changed the parents' opinion.

In order for communication to take place, a receiver must detect the sender's message. The sender's message could be information about an internal state, such as fear, hunger, or sexual receptivity, or about an external condition, such as the presence of a predator. The message is placed into a **code**. The firefly's code is made up of specific patterns of flashes. Humans have a highly elaborate code called *language*, made up of large numbers of individually distinct words and the rules to combine them. The words *language* and *communication* are not synonymous. Communication is a very broad concept. All organisms communicate. **Language** is a much narrower concept, and in its narrowest sense language is seen by linguists as a uniquely human capacity used to produce and understand precise meaningful **utterances** (stretches of speech between two periods of silence or potential silence). (See Box 1-1).

A **code** is a complex pattern of associations of the units of a communication system. In language, those units could be sound units; meaningful units, such as words; or meaningful units that are larger than words, such as phrases, clauses, and sentences.

Language in its narrowest sense is, for most linguists, a uniquely human cognitive system used to produce and understand precise meaningful utterances.

An **utterance** is a stretch of speech between two periods of silence or a potential (perceived) silence. An utterance does not have to be a complete sentence.

To **encode** is to put a message into code.

All codes have rules. Certain types of flashes in a specific sequence make up the firefly's code. When it has a message to convey, the firefly **encodes** that message according to the rules. How does the firefly know these rules? Well, it doesn't. It is preprogrammed by its species-specific genetics to encode certain messages at certain times. These messages might be encoded as the result of internal physiological processes (such as the production of specific hormones) or when specific external stimuli activate a response to encode the message.

Although there might be universal aspects of all languages that are innate, specific languages are learned. The potential to acquire a language is also innate. Humans have the genetic potential to learn to encode their messages by acquiring the rules, or **grammar**, of their language. Some nonhumans might have a limited potential to grasp very basic principles of grammar, but complex principles of language are well beyond their abilities.[1]

Grammar is the system (pattern) of elements (such as words) and of the rules of phonology, morphology, syntax, and semantics inherent in a language. The term grammar also refers to the study of those elements and rules.

[1] W. Tecumseh Fitch and Marc D. Hauser, "Computational Constraints on Syntactic Processing in a Nonhuman Primate," *Science* 303 (January 13, 2004), 377–380.

BOX 1-1

The Faculty of Language in the Broad Sense and the Faculty of Language in the Narrow Sense

Two biologists, Marc Hauser and W. Tecumseh Fitch, and linguist Noam Chomsky point out that current evidence indicates that nonhuman animals including apes and birds, such as Alex the parrot, may share some of the characteristics that are important for the facility of language in humans. They called these shared capabilities the faculty of language in the broad sense (FLB). The FLB includes the motor and neurological systems that allow us to interact with the world around us and the physical and neurological systems that allow us to create sounds and movements that have the potential to communicate. Some nonhuman animals have conceptual-intentional systems that store knowledge about the world and allow the animal to form intentions on the basis of that knowledge and act on those intentions, as when a chimpanzee in the wild makes a tool in order to exploit a food source. Some animals have complex navigational systems; others can recognize themselves in mirrors or react differently to different colors, shapes, and numbers of items. Some psychologists even think that chimpanzees can infer from actions of others what a person or other chimpanzee is thinking.

Noam Chomsky's linguistic theory defines language as a cognitive computational function. The human mind can take a finite number of items (sounds or words, for instance) and rearrange them into a potentially infinite number of messages according to a program (grammar). Some of the elements of that program are universal and innate, and some of the elements are learned. In this regard, Hauser, Chomsky, and Fitch believe that there are characteristics of language that are unique to human language. They call the unique characteristics of language the faculty of language in the narrow sense (FLN). The primary feature of FLN is recursion. **Recursion** is the process whereby any linguistic unit can be made longer by embedding another unit in it. I can say, "I am going to the store." Or I can say, "My wife and I are going to the store." Or I could say, "My wife, children, and I are going to the store." In fact, I can add to the first sentence endlessly. Notice that I can also add to the end of the sentence: "My wife, children, and I are going to the store and then we are going to a movie." The recursiveness of language allows people to compare, analyze, and combine thoughts in a limitless way. To Hauser, Chomsky, and Fitch, the recursive property of language is the main thing that makes language unique to humans.[2] However, even this has been questioned recently. Linguist Dan Everett has said that the language of a people who inhabit the rainforest of northwestern Brazil, the Pirahã, does not display recursion. Although this conclusion is controversial, if this were true, then concepts of universal grammatical principles would also be questionable. The June 2009 issue of the journal *Language* contains a debate on this important topic.[3] There is more on this in Chapter 7.

Recursion is the process whereby any linguistic unit can be made longer by embedding another unit in it.

Communication occurs if the receiver then decodes the message that is sent. To **decode** a message means to react in a way that reflects the reason the message was encoded. If a person speaks a language that a second person does not know, the listener will not decode the first person's message. The listener will not know what the words mean and, of course, will not know the grammar implicit in the message.

To **decode** a message is to react to it in a way that reflects the reason that the sender encoded it.

[2]Marc D. Hauser, Noam Chomsky, and W. Tecumseh Fitch, "The Faculty of Language: What Is It, Who Has It, and How Did It Evolve?" *Science* 298 (November 22, 2002), 1569–1579.
[3]Andrew Nevins, David Pesetsky, and Cilene Rodrigues, "Pirahã Exceptionality: A Reassessment," *Language* 85 (June 2009), 355–404. Daniel L. Everett, "Pirahã Culture and Grammar: A Response to Some Criticism," *Language* 85 (June 2009), 405–442.

There are several levels of grammar that must be acquired. Acquiring a language involves acquiring the **phonological system** of that language: what sounds are used and how they are related to each other. It also involves learning the vocabulary or **lexicon** of a language and the ways in which lexical items, such as words, are constructed; these are the **morphological rules** of a language. Acquiring a language also involves learning how sentences are constructed and how sentences are related to each other; this is knowledge of the **syntax** of a language. A person must also recognize how words and sentences relate to the objects to which they refer and the situations that they describe. **Semantics** is the study of the rules of meaning, the systems by which we derive meaning from a message.

The **phonological system** of a language is the grammar (pattern) of sounds of that language.

A **lexicon** is a mental dictionary, the vocabulary that one has stored in the brain.

Morphological rules are the rules used to construct words from their component parts.

Syntax is the set of rules a person uses to form units of language larger than words. The term *syntax* also refers to the study of those rules.

Semantics is the study of meaning.

Although grammar is learned, it is learned so subtly that most of the rules are subconsciously known. This mostly subconscious knowledge of the grammar and lexicon of one's language is **linguistic competence** that is drawn upon to properly encode and decode a virtually infinite number of linguistic messages. If you speak English, you know that the following sentence is syntactically correct: "I am going to the store." You also know that the following sentence is not correct: "*Store to the going am I." (Note: "*" means that the form is ungrammatical.)

Linguistic competence is the (mostly) subconscious knowledge of language that allows a speaker to create a potentially infinite number of messages.

You know that in an English sentence (a declarative sentence), such as the correct one above, the subject comes first, followed by the verb, and then information to complete the sentence, such as a prepositional phrase. If you are a native speaker of English, you were not taught this in a formal manner. You acquired knowledge of the syntactic rules involved in this sentence by listening to other people speak. As you listened to and experimented with language, you built up a subconscious inventory of rules. These rules let you do an amazing thing: create a virtually unlimited number of utterances from a limited number of words. You have never before spoken most of the sentences that you will speak today. This creative aspect of language is often called **productivity**. It allows us to express and understand ideas that have never before been expressed.

Productivity is the ability to produce messages that one has never produced before and to understand messages that one has never heard or seen before.

The fact that we have an internalized linguistic competence does not mean that we always apply it correctly. If you are tired, sick, or distracted, you might make mistakes. You might repeat a sound that occurred earlier in a phrase. For instance, the intended utterance "Bob gave the baby a toy" might be said as "Bob gave the baby a boy."

This mistake is not a mistake in competence. The speaker will most likely know he or she said something wrong. It is a mistake in **linguistic performance**. Performance errors are often systematic. That is, certain types of errors occur regularly. For instance, certain sounds are consistently substituted for others, sounds are systematically transposed with other sounds, and sounds are added or omitted in predictable ways. Because speech errors are not accidental, their study has shed light on the mental organization underlying linguistic competence.

Linguistic performance is the application of linguistic competence to actually producing an utterance.

Humans encode and decode linguistic messages on the basis of shared knowledge of a learned code. Two people speaking the same dialect (variety) of English will have little problem communicating with each other. On the other hand, two people who speak mutually unintelligible languages will not be able to communicate linguistically. However, they may be able to communicate through sharing information by some other means, such as gesturing.

Communication can be sent over a number of channels. The movement of the vocal apparatus puts air into motion. The resulting sound waves are received by the ears and decoded by the brain. Most language is conveyed in this way—that is, by speech. However, there are those people who cannot speak or hear. For them, the vocal-auditory channel is closed. Yet this does not mean that they cannot communicate linguistically. Language resides in the mind—that is, the brain. It is not

dependent on hearing or speech. People who do not speak, use silent languages based on movements of the hands and body. These are full languages, capable of communicating any message an oral language can convey. Humans can also communicate linguistically through another channel—writing. Speech, sign language, and writing are called **delivery systems of language**. Language is the lexicon and grammatical rules that exist in your head. Speech, sign language, and writing are the ways that linguistic (**verbal**) knowledge gets out of your head and into the heads of others; that is, these are systems to deliver linguistic information. Speech, sign language, and writing will be discussed later in this book.

A **delivery system of language** is the way in which knowledge of language (linguistic competence) is used to send a message. The three basic ways of delivering a message linguistically are speech, writing, and sign language.

Verbal means language: speech, writing, or sign language.

Nonverbal means not language. Nonverbal communication is any communication that is not conveyed through speech, writing, or sign language.

Humans also communicate in nonverbal ways. **Nonverbal** means nonlinguistic—that is, not through speech, sign language, or writing. Humans, as well as other animals, communicate with gestures, by changing the spatial arrangement between individuals in a group, by their physical appearance, facial expressions, touching behavior, and other means (see Chapter 11). Communication cannot be completely explained in a linear fashion; that is, in terms of a simple transmission of a message (information) from a sender to a receiver over a channel of communication. Instead, it might be characterized as an elaborate "dance." This dance includes a **synchrony** (simultaneousness) of linguistic messages with nonverbal messages. As people talk, their bodies move to punctuate what they are saying and sometimes to contradict what they are saying. Their words are reinforced with the emotions conveyed through facial expressions and even pupil dilations and contractions. They touch each other to express concern, reinforcement, and affection. They take turns. In fact, if you watch people communicate "with the sound off," that is, from a distance, they appear to be involved in an elaborate dance. Through this dance, messages evolve that may not conform to the original intent of the initiator of the communication. In other words, human communication is dynamic, involving feedback that is both linguistic (verbal messages) and nonlinguistic (nonverbal messages). The outcome is often, perhaps usually, not completely predictable.

Synchrony is the connection and relationship between two or more things that occur at the same time.

The result of a communicative act is not always predictable because the meaning of a message is not contained only in the message itself. The meaning of a message is dependent on such factors as the intention of the sender, the relationship of the sender to the receiver, the social context of the message, and the personal and cultural background and biases of the sender and the receiver (see Box 1-2). In addition, there can be interference in the transmission of a message. This interference (sometimes called *static* or *noise*) might have to do with the physical environment. Examples of physical interference to communication might be traffic noise, a loud air conditioner, someone standing in front of a sign language interpreter, or a page produced by a printer that was almost out of ink. There can also be semantic interference. For instance, a receiver simply might not completely understand what the sender intended to say. Or a person might make the wrong assumptions about the person with whom he or she is communicating, and this will affect the decoding of the message. Communication involves "engagement and disengagement, synchrony and discord, breakdown and repair."[4] From this dance, messages emerge. (For a fieldwork exercise in observing and analyzing people's linguistic behavior, see Exercise 1, Appendix C. For a more detailed discussion of various models of communication, see http://www.cultsock.ndirect.co.uk/MUHome/cshtml/introductory/sw.html.)

[4]Stuart Shanker and Barbara King, "The Emergence of a New Paradigm in Ape Language Research," in *Behavior and the Brain* (London: Cambridge University Press, 2002).

BOX 1-2

Miscommunication Based on Cultural Differences

People from the same culture might misinterpret the meaning of one another's messages partially because of individual differences based on personality traits and differences in socialization. For instance, one person might, with positive intention, ask another person questions that are thought to be overly personal and invasive. However, it is even more likely that people from different cultures will misinterpret one another's messages.

Culture shock is the disorientation and anxiety that occur when social expectations are not met.

Travelers, including businesspeople, who enter foreign countries often experience what anthropologists call **culture shock**. Culture shock is the disorientation and anxiety that occur when social expectations are not met. Culture shock sometimes leads to depression, homesickness, and negative attitudes about a foreign culture.

Within a culture, people's behaviors are relatively predictable. If one American meets another American for a business meeting, a firm handshake might communicate confidence, sincerity, and a willingness to conduct business. However, among some Middle Eastern, Asian, and American Indian cultures, a firm handshake might be interpreted in a negative way, indicating aggression and lack of respect. The misinterpretation of intent will most probably affect whatever interaction follows. Thousands of verbal and nonverbal behaviors that we learn, mostly subconsciously, as a part of our culture might have an unintended consequence in a foreign culture. What topics we choose to talk about, how long we talk about those topics, how fast or slow we talk, to whom we address our conversation (based on the age and gender of the people in a room, for instance), when and why we laugh, whether we look directly at the person we are talking to, where and when we touch another person, will all affect how others judge us and react to us (see Chapter 11 on nonverbal communication).

Culture shock might occur when the norms that we take to be the correct and positive ways to act receive negative feedback from others. It can also occur when we don't understand the norms and social cues of other people. Often this will lead a person to negatively evaluate another culture as being "wrong," or "primitive," or even "evil." This is called ethnocentrism.

Ethnocentrism is judging other cultures by the standards of your culture; it is also the belief that your culture is superior to other cultures.

Ethnocentrism is judging other cultures by the standards of your culture; it is also the belief that your culture is superior to other cultures. Often, as people have more experience with a foreign culture and gain more understanding of that culture, their ethnocentrism decreases. As cross-cultural understanding increases, the opportunity for static or interference in communication decreases.

For information on cultural differences in behavior that might specifically affect business communication, access *International Business Etiquette and Manners* at http://www.cyborlink.com/ The website gives information on doing business in numerous countries. Also, see Box 11-3 on cultural differences in the meaning of color.

Nonhuman and Human Communication Compared

In the previous section, some basic concepts about communication and language were introduced. Now we will refine our understanding of these topics through comparison.

The Dance of the Honeybee

A bee, home from the discovery of a nearby source of food, begins to "dance" on or inside the hive. This dance, called the *round dance*, contains no directional

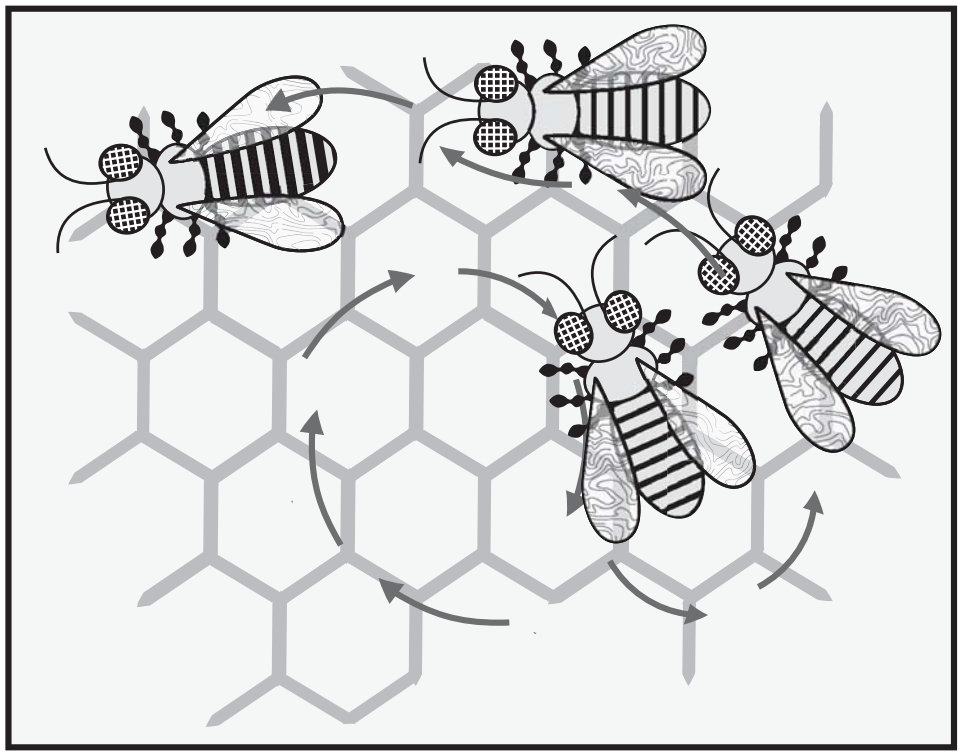


FIGURE 1-1 Honeybee Round Dance

The forager bee (uppermost) moves in circles. Taking rapid rocking steps, she is followed by three workers. The workers acquire knowledge of a food source that is close to the hive. Different types of honeybees use this dance to indicate food at different distances. Usually, this distance does not exceed eighty-five meters.

Source: Reprinted by permission of the publisher from *The Dance Language and Orientation of Bees* by Karl von Frisch, translated by Leigh E. Chadwick, Cambridge, Mass.: The Belknap Press of Harvard University Press, Copyright © 1967, 1993 by the President and Fellows of Harvard College; p. 29.

information. It simply arouses the other bees. They are stimulated to take flight around the hive in a search for the odor that the dancer has brought from the food source (see Figure 1-1).

When a bee returns from a more distant food source, she does what is called the *Schwanzeltanz* or the *waggle dance* (see Figure 1-2). She wags her abdomen as she runs straight for a short distance while making a rasping sound with her wings. She makes turns that create a figure-eight design. The movements of the dance indicate to the other bees in the hive where the scout bee found the food. Karl von Frisch was the first to decode the dances of the honeybees.[5] As early as the 1940s, he found that honeybees can communicate the direction, distance, and quality of a food source to members of their hive through elaborate dances. Scientists have also discovered that the bees produce a hive-specific **pheromone** that they leave at the source of the nectar, helping to direct the other bees to the site. A pheromone is a chemical that is secreted by one individual and acts from a distance on another individual to alter that individual's behavior. The scout bee also brings back the scent of the nectar itself, which further aids the other bees in locating the food source. So there are several indicators of where the food is located: the "dance," the pheromone, and the odor

A **pheromone** is a chemical that is secreted by one individual and acts from a distance on another individual to alter that individual's behavior.

[5]Karl von Frisch, "Tanze der Bienen," *Osterr. Zod. Z.* 1 (1946), 1–48. More recently, see K. von Frisch, "Decoding the Language of the Bee," *Science* 185 (1974), 663–668.

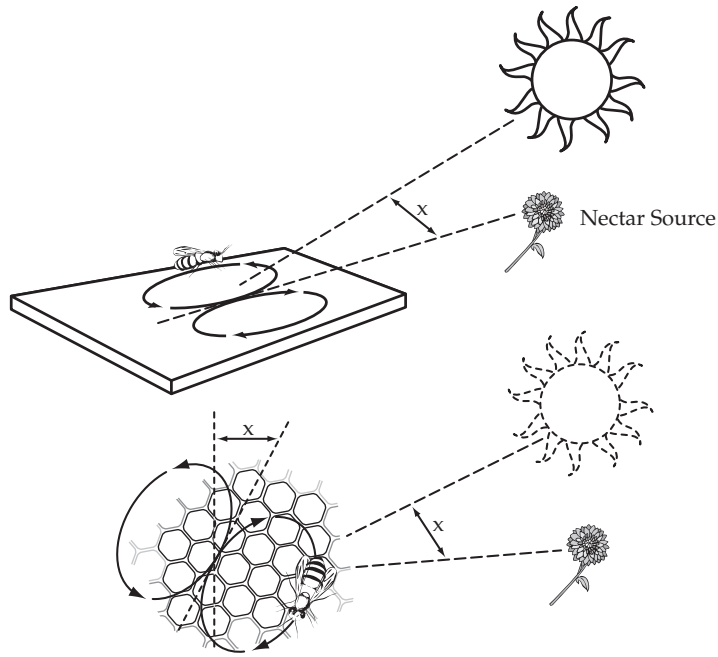


FIGURE 1-2 Waggle Dance of the Honeybee

Source: John Alcock, *Animal Behavior* (Sunderland, Massachusetts: Sinauer Associates, 1975), 420. Copyright © 1975 by Sinauer Associates, Inc. Reprinted by permission.

Redundancy occurs when the same message (or elements of a message) is encoded in different ways and is simultaneously sent to the receiver of the message.

of the food. In other words, there is **redundancy** in the bee's communication about the nectar. The condition of redundancy exists when there are multiple channels of information or multiple messages over the same channel of communication that indicate the same information. Redundancy helps to get the message to the receiver of the message. If there is interference or "static" on one channel of communication or in one of the repetitive messages on the same channel, another of the messages might still get through. If there is a wind or competing odors that obscure the pheromonal message or the scent of the food source, then the bees may still locate the nectar primarily on the basis of the dance. If the view of the dance is blocked or interrupted, the bees may still find the nectar on the basis of odor. The redundancy in human communication, including language, will be discussed in later chapters.

In recent years, the strength of the above scenario has been questioned.[6] Some studies indicate that the main function of the dance is simply to motivate the observer bees to go out and forage for nectar. Although the information described above is encoded in the bees' dance, most of the bees are stimulated by the dance to search for nectar in areas they have been before, rather than to follow the directions in the dance or even the olfactory information. Nevertheless, the dance shows how complicated the process of communication can be in an animal such as an insect.

Do Bees Learn Their Behavior?

When introduced to a hive, a bee raised in isolation will do all the dances that the hive-raised bees do. However, it will not do the dances with equal precision. It appears that a young bee needs a couple of hours of flying experience to be able to use

[6]Christoph Grüter, M. Sol Balbuena, and Walter M. Farina, "Informational Conflicts Created by the Waggle Dance," *Proceedings of the Royal Society of London—Series B: Biological Sciences* 275 (June 7, 2008), 1321–1327.

the sun's course accurately. A young bee must also practice following dancers before it can react accurately to the other bees' dances. So we can say that the general pattern of bee dancing is innate, but precision is partially learned.

Bees dance. Birds dance, too, especially in mating rituals. But it is the calls and songs of birds rather than their dances that we turn to next.

The Vocalization of Birds

Danger lurks all around for birds. A main response to a potential predator is the alarm call. A blackbird, sensing a danger to its nest, will produce a call that sounds like "dook." A call that sounds like "ziep" will advertise that the danger is considerably more serious. Depending on the species, birds have a code containing as few as three and as many as thirty calls. The most frequent calls broadcast a potential or actual danger. When a bird gives out an alarm call, the predator has lost one of its most potent weapons: surprise.

Calls are not limited to signaling alarm. The chicks of some species signal each other while still in the egg! Apparently this synchronizes the time that they will hatch. Other calls coordinate a flock while in the air; keep a mated pair together; mislead enemies; convey begging; indicate hunger, pain, or abandonment; show the need for rest; or indicate the presence of a nest.

The development of an instrument called the **sound spectrograph** revolutionized the study of sound signals, both animal and human. It produces pictures of sound. These graphic expressions make detailed analyses of sound much easier than analyses done from a sound recorder. Figure 1-3 is a sound spectrogram of the flight-alarm calls of five species of birds. All of these alarm calls are long, with a tapered beginning and end. The similarity in these calls is most likely because this type of call makes it difficult to pinpoint the location of the bird that is emitting it.

The **sound spectrograph** is an instrument used to analyze sound by producing a visual record of the time duration of the sound, its frequency (number of occurrences within a specific unit of time), and its amplitude (degree of loudness).

Calls are one of two main categories of bird sounds. The other category is song. Like most things in nature, the distinction between these categories is not clear cut.

Generally, **calls** are short, consisting of up to a few notes. Bird **songs** are more elaborate, as illustrated in Figure 1-4. Calls and songs also serve different functions. A male bird attracts a mate basically by using a song. The male bird also uses a song to warn other birds away from a specific area he has claimed. Whereas calls of various species of birds are often similar, songs are not. This makes good sense. An alarm call of one bird will often alert other birds to danger. All potential prey will benefit. Yet a bird must find a mate of its own species and establish its own territory. Hence, bird songs are species specific and to some degree can be individual specific. Another difference between calls and songs has to do with the acquisition of these sounds. With few exceptions, calls seem to be completely innate. On the other hand, the acquisition of bird songs shows a complex relationship among genetics, learning, and the environment.

Calls are usually relatively short vocal signals that might communicate a variety of messages. A variety of other species might respond to the calls of a given species.

Songs are longer and more complex sequences of sound that, in birds, are usually associated with attracting a mate. Songs are species specific.

Inheritance and Learning in Birdsongs

A bird reared in isolation will not sing the same as a bird reared in its natural environment. As with bee dancing, this indicates that the bird learns details of its song from its environment. A classic experiment involving the American white-crowned sparrow showed this convergence of heredity and learning. The white-crowned sparrow raised in isolation will not develop the normal song. It will sing, but the song will be simpler and lack features of the normal song. The bird must be exposed to members of its own species. The exposure must take place within fifty days of hatching. The fact that the isolated bird will sing a song that is similar