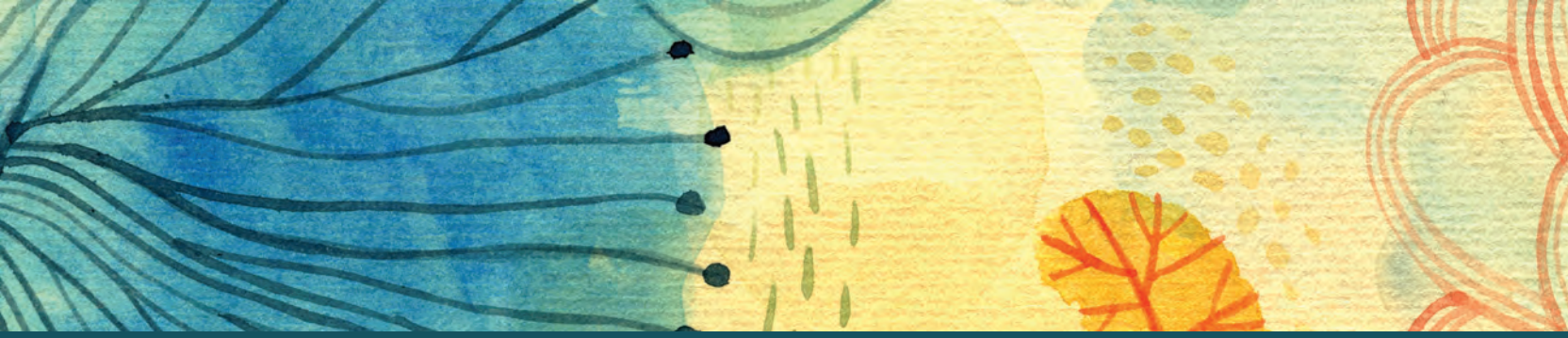
INTRO

A Guide to COMMUNICATION SCIENCES *and* DISORDERS

THIRD EDITION



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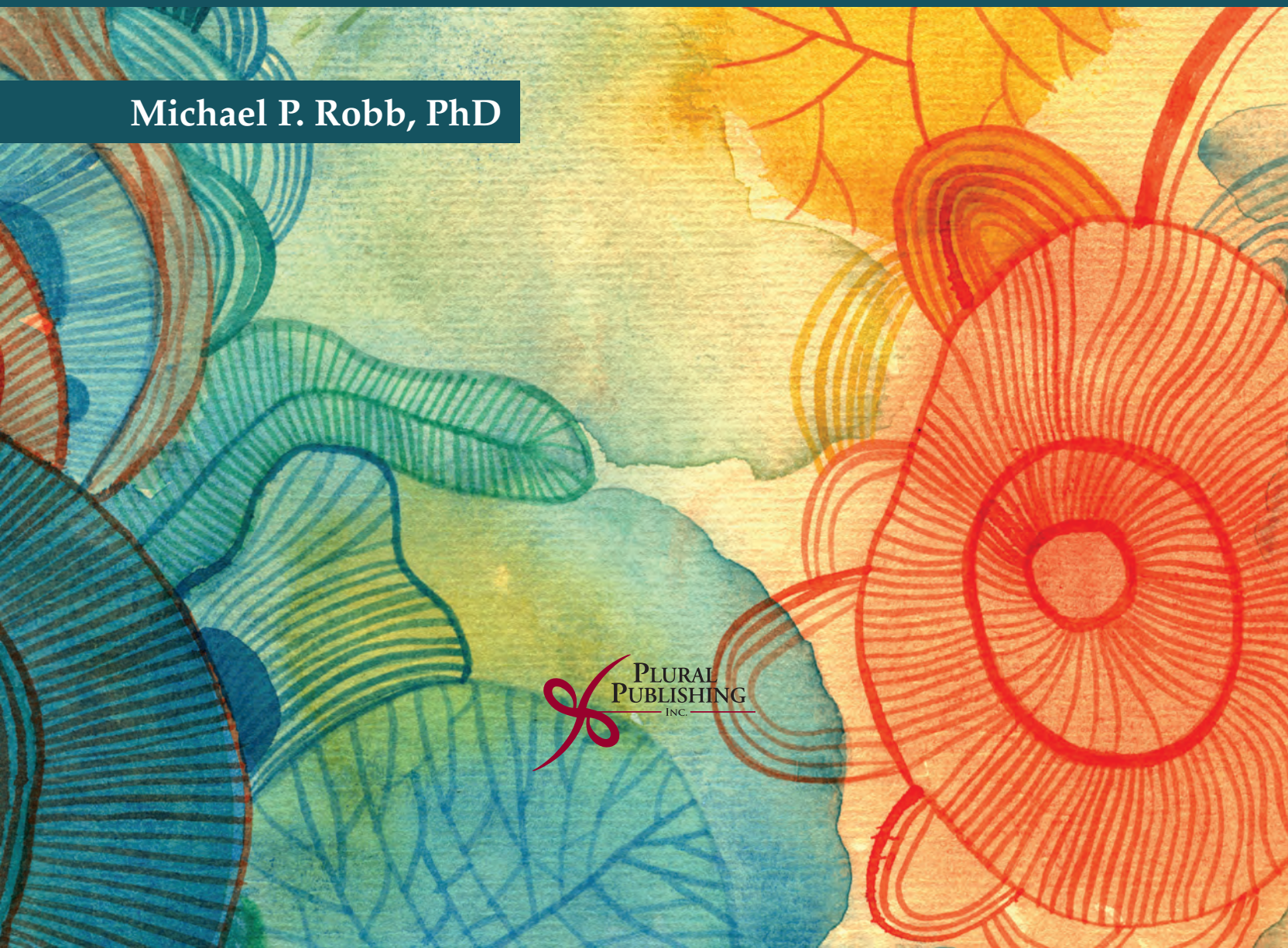
Michael P. Robb, PhD



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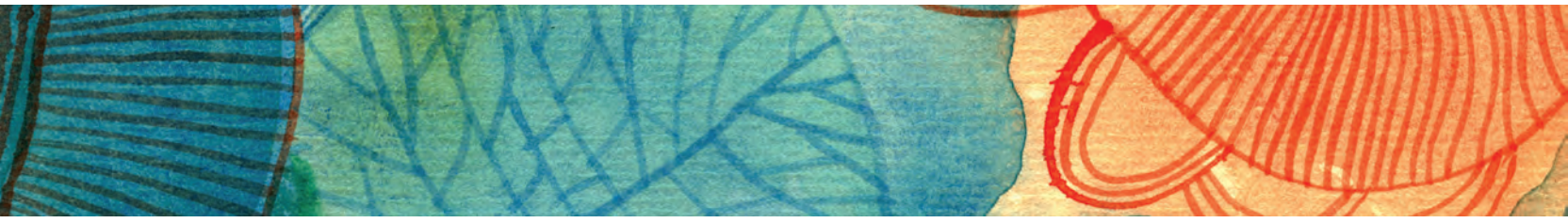

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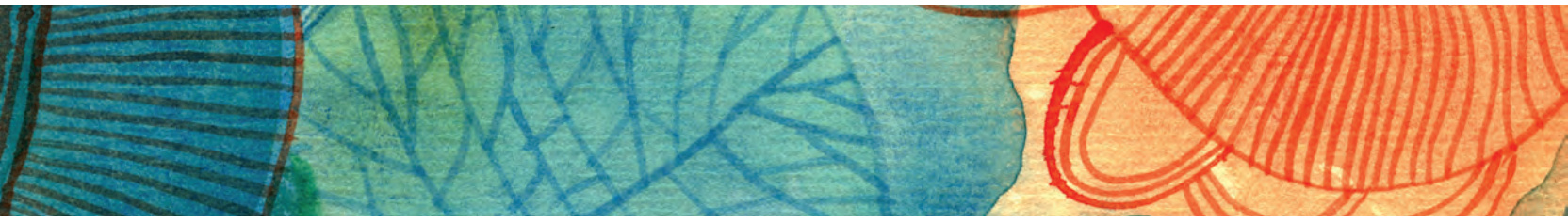

FOREWORD

What a pleasure it is to see the new edition of Professor Robb's *INTRO: A Guide to Communication Sciences and Disorders*. As someone who has taught the introductory course over many years and watched the incredible scientific and professional development of this field of study, I can vouch for this text as a comprehensive overview of Communication Sciences and Disorders. One of the several features that makes this text special is placing it within an international framework. Disorders of Communication have no national boundaries. Professor Robb has brought to the introductory student a broad and current understanding of the science that underlies the study of communication disorders, the nature of the various disorders that can occur, and the current best practices for their remediation. He brings the experience of his long career in this field at several distinguished academic programs throughout the United States and New Zealand to aid the beginning student in understanding and appreciating this important field of study. I have long appreciated his academic prowess and personal friendship.

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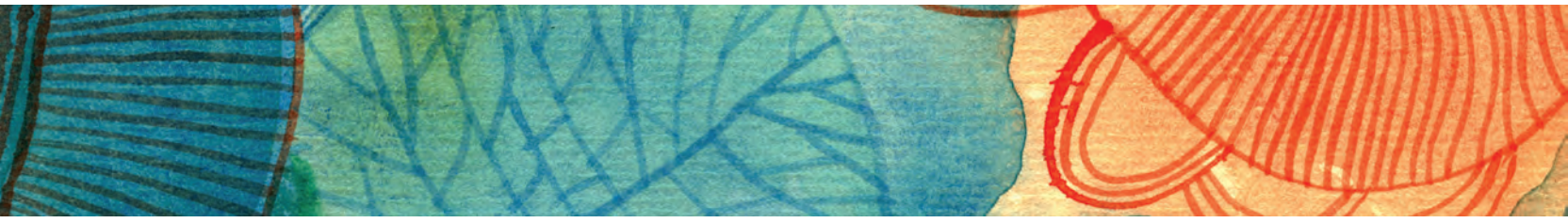


PREFACE

First released in 2010, ***INTRO*** is designed for the beginning university-level student who has an interest in entering the field of communication sciences and disorders, or for a student who may be interested in entering one of the companion health professions. As is the case for any book claiming to be *introductory*, the aim is to paint a picture for the student using broad strokes. This book provides straightforward and essential information concerning a wide range of communication disorders found in children and adults. The sole authorship of the book ensures a balanced writing style that is missing from existing introductory texts. Now in its 3rd edition, the book remains a core source of information for beginning students entering the profession of audiology or speech-language pathology.

The format of the 3rd edition is similar to earlier editions, but each chapter has been extensively updated. The 13 chapters are organized into four sections. Section 1 provides background information related to communication disorders. The chapters in this section cover the topics of communication science, the professions of audiology and speech-language pathology, and anatomy and physiology. Section 2 is concerned with developmental communication disorders, and includes chapters on child language disorders, child phonological disorders, fluency disorders, and cleft lip and palate. Section 3 covers acquired and genetic communication disorders. The chapters in this section describe voice disorders, neurogenic communication disorders, dysphagia, and genetic-based communication disorders. A new chapter dedicated to Augmentative and Alternative Communication is now included in Section 3. Section 4 addresses audition and contains chapters on hearing disorders and aural rehabilitation.

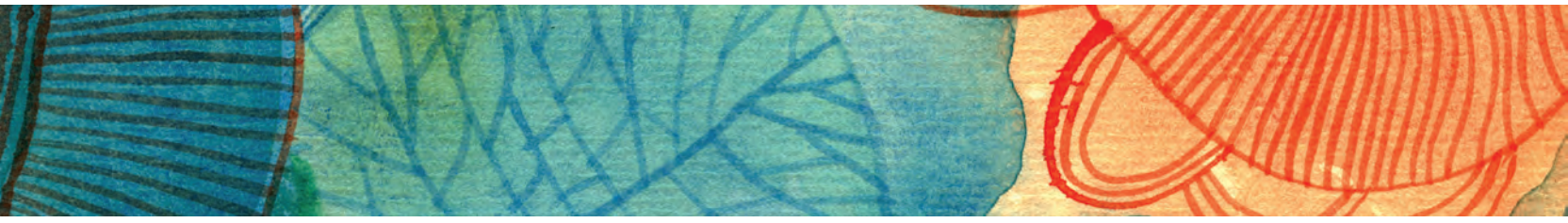
Unique aspects of the book include its use of an identical structure for each chapter to assist beginning students in grasping new vocabulary and concepts. Each chapter also provides a focus on "past and present." An introduction to each of the various disorders would not be complete without knowing some of the fascinating historical background surrounding each disorder, as well as current theories and research. In the years that have passed since the 2nd edition, there have been exciting research advancements in communication sciences and disorders. Each chapter highlights some of the very latest research findings.

The book holds worldwide appeal and is written for an international audience. A portion of each chapter is dedicated to cultural aspects of communication disorders, as well as prevalence information about various communication disorders as found in English-speaking countries around the world, including Australia, Canada, New Zealand, India, the United Kingdom, and the United States. The chapters include a series of FYIs (for you information), which present interesting and novel information about the particular topic area. A number of websites are listed at the end of the chapters that provide students with an opportunity to learn more about each topic. Many of these websites provide real-life examples in the form of video links.

INTRO is a clear and concise primer for students wishing to obtain fundamental information about the myriad of communication disorders that

occur across the lifespan. For some, this information will serve as a springboard for pursuit of a professional career in audiology or speech-language pathology. For others, my hope is that you will acquire an appreciation of the gift of communication that we so often take for granted.

—M. Robb



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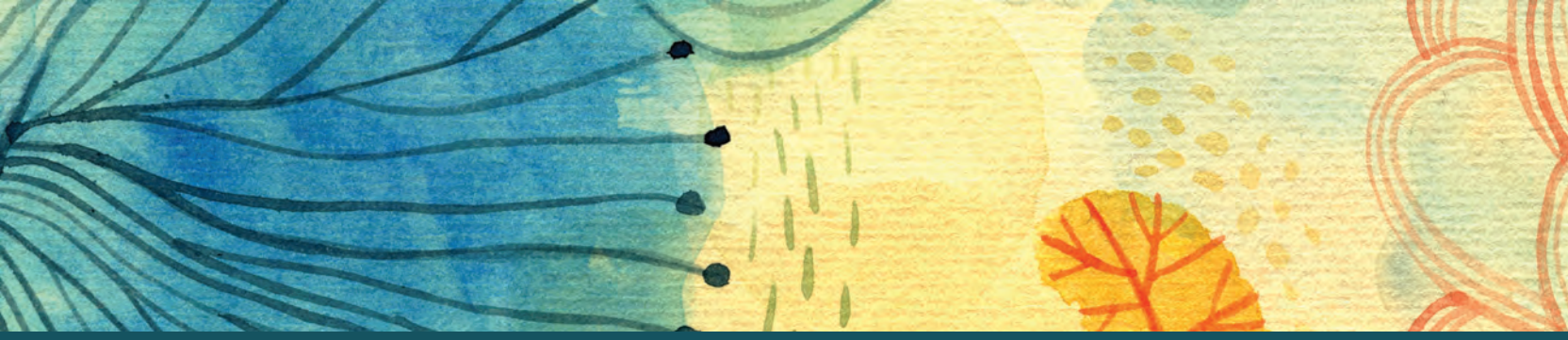


SECTION 1

Background to Communication Sciences and Disorders

1

COMMUNICATION DISORDERS AND THE PROFESSIONS

OBJECTIVES

After reading this chapter, the student should be able to:

- Recognize the different forms and types of communication.
- Demonstrate an understanding of the audiology and speech-language pathology professions.
- Describe the various work settings for audiologists and speech-language pathologists.
- Demonstrate an understanding of developmental and acquired communication disorders.
- Demonstrate an understanding of organic and functional communication disorders.
- Demonstrate an understanding of epidemiology, including prevalence and incidence.
- Demonstrate an understanding of the Code of Ethics.
- Describe cultural competency in audiology and speech-language pathology

INTRODUCTION

Communication is any act involving the exchange of information related to a person's needs, wants, perceptions, knowledge, or feelings. At birth we are equipped with the physical attributes to communicate. Our earliest forms of communication are quite basic and revolve around fundamental needs and desires between infant and caregiver. As we grow, we learn to communicate more effectively by observing other people communicating. We model our communication on what we see, hear, and experience. Our communication skills grow in complexity and sophistication through formal education, and by practicing those skills and having them evaluated.

Most of us take communication for granted. We tacitly assume that when we speak, we will be understood, or when someone speaks to us, we will understand them. Only when a breakdown in communication occurs do we realize how special and vital this act is to our daily lives. A **communication disorder** is a diagnosed condition in which a person is unable to say correctly what he or she wants to say and/or is unable to understand some or most of what is being said. Some individuals may have an isolated impairment in speech or hearing; others may have impairment in both domains. Simply stated, a communication disorder is any impairment in the exchange of information that deviates from what might be considered normal. The nature of the disorder may range from mild to severe. However, the impact of the disorder upon a person's ability to communicate may be profound, regardless of the severity. The focus of this book concerns situations when the process of speaking and listening is somehow impaired. A communication disorder is one of the most common types of disabilities found throughout the world. When communication fails, misunderstandings occur, and sometimes people become frustrated, worried, or even angry. Some communication impairments are minor and can be easily corrected, whereas others are more severe and may require an extensive period of treatment. This first chapter is intended to introduce the nature and type of communication disorders found across the lifespan—from children to adults. In addition, the professions dedicated to helping individuals with communication disorders are profiled.

The most widely used language in the world is Mandarin with more than 1.2 billon speakers. Next on the list is Spanish with more than 700 million speakers. English is the third most widely used language with 500 million speakers.

TERMINOLOGY AND DEFINITIONS

As a prerequisite to understanding various communication disorders, it is important to first have a grasp of normal communication. Knowledge concerning the normal process of communication serves as the foundation for the identification and management of communication disorders. The word **communicate** is related to the word **common**. The word has its origin in the Latin verb *communicare*, which means "to share" or "to make common." When we communicate, we make things common. Communication is one of those activities that we take for granted. It seems to occur naturally, and we spend the majority of our living hours engaged in some form of communication. Although we tend to think of communication as talking to someone, communication also occurs in other ways, like when we watch television or send a text message. We communicate to others by the way we dress, the style of our hair, and the tattoos we choose (or choose not) to wear. At a fundamental level, communication can be defined as a two-way process in which a message is sent and received. The sender's role in the process of communication is to generate (or **encode**) a message. The receiver's role is to translate (or **decode**) this message. Communication is never a one-way process. Both the sender and the receiver need to participate. If the sender is unable to clearly encode a message, then a breakdown in communication occurs. Similarly, if the receiver is unable to suc-

cessfully decode a message, then communication is likely to fail. Excellent communicators are those who have mastered the process of both sending and receiving messages. It is estimated that 75% of a person's day is spent communicating in some way. Most of our daily communication involves speaking and listening to others. The remaining portion of the day is spent communicating via reading and writing.

Verbal communication is at the core of what most of us do; it is the expression of language using spoken words. Our verbal communication varies depending on the particular communication act, as well as the formality of communication. Acts of verbal communication include: (1) discussion, (2) dialogue, and (3) debate. **Discussion** is an act of verbal communication to make decisions. Discussions are likely to involve the exchange of facts and opinions between communicating partners. **Dialogue** refers to the free-flowing conversational exchange of ideas. These ideas involve the sharing of perspectives and understandings. The act of **debate** differs from discussion and dialogue because this form of verbal communication is used to achieve agreement on a topic, which other participants of the communication may not share. We often think of debate as the verbal communication found in the political arena. One person states a point of view, which is subsequently challenged by an opposing view.

Verbal communication also varies in its formality. The level of formality can be found in the vocabulary and grammar characterizing spoken language. Formal verbal communication follows a specific code of communicating that might be found in settings such as classrooms, courtrooms, job interviews, or formal parties. Alternatively, informal communication also has a specific code of communication, but allows for a much varied manner of speaking. Situations such as hanging out with friends and informal parties are likely to reflect a markedly different form of speaking compared with more formal settings.

Nonverbal communication refers to the features of communication that occur aside from what is actually spoken or heard. There are at least six different types of nonverbal communication that we use and experience on a daily basis. These include: (1) paralanguage, (2) sign language, (3) body language, (4) tactile communication, (5) proxemics, and (6) appearance. **Paralanguage** refers to factors such as tone of voice, loudness, inflection, and pitch. By altering these various parameters of voice, the message conveyed is likewise altered. A simple example would be to communicate an identically worded message, such as "Watch your step," in a soft comforting voice versus a loud, alarming voice. A listener of this same message would likely interpret these messages quite differently.

Sign language is a form of expressive communication where words are replaced by gestures. Commonly used gestures include waving, pointing, and using fingers to indicate number amounts. There are also fully developed language systems that rely exclusively on signs, as are often found in the deaf community. This form of sign language is discussed further in Chapter 13.

Body language pertains to our use of facial expressions or postures to communicate information. Facial expressions are responsible for a huge proportion of nonverbal communication. One need simply smile or frown to communicate a clear nonverbal message. One way of concealing our communication via body language would be to put on a "poker face," which is a face that shows no emotion or change in expression. Expert card players are masters in the use of body language to prevent other card players from knowing the strength of their card hand.

Tactile communication refers to communication that occurs via touch. The use of touch can play a comforting role when paired with verbal communication such as consoling a grieving spouse. Use of touch between parent and child during the infancy period has also been shown to play an integral part in establishing social interaction. **Proxemics** concerns how space and time are used to communicate. A common example is our need for interpersonal space when communicating with others. The amount of personal space needed when having a casual conversation with another person usually varies between 18 inches and 4 feet. In contrast, the personal distance needed when speaking to a crowd of people is around 10 to 12 feet. Our **physical appearance** plays an important role in communication. Physical appearance such as clothes and hairstyle serves to convey a message regarding a person's attitude, mood, wealth, and cultural background, which subsequently affects the judgment and interpretations of others.

FYI

Before the development of speech, the most primitive form of human communication was likely to have been shouting. A group of primates would construe loud sounds as associated with danger.

FYI

The first vocalization produce by infants is a cry. Babies cry for various reasons: when they are uncomfortable, hurt, hungry, or for no reason at all. Researchers are now exploring whether the early crying of infants is language-specific. For example, do German babies cry differently than Chinese babies? If so, it would seem that babies are acquiring this ability prior to birth—in their mother's womb.

MODELS OF COMMUNICATION

The term **model** has a wide range of uses. It can refer to a type of product, a person who poses for photographers, or a miniature version of an object. From an academic standpoint, a model refers to an abstract idea. The **transmission model** of communication is an idea regarding the way in which humans communicate. This classic model was proposed by Claude Shannon and Warren Weaver (1949), who were electrical engineers working for Bell Telephone Laboratories in the United States. The essence of the model is that the successful transmission of a message requires both a sender and a receiver. A simplified version of the transmission model is shown in Figure 1–1. The model depicts the process of communication as one in which a person affects the behavior or state of mind of another person. If the effect was smaller or different from what was originally intended, than a failure in communication takes place. A modification of the transmission model was proposed

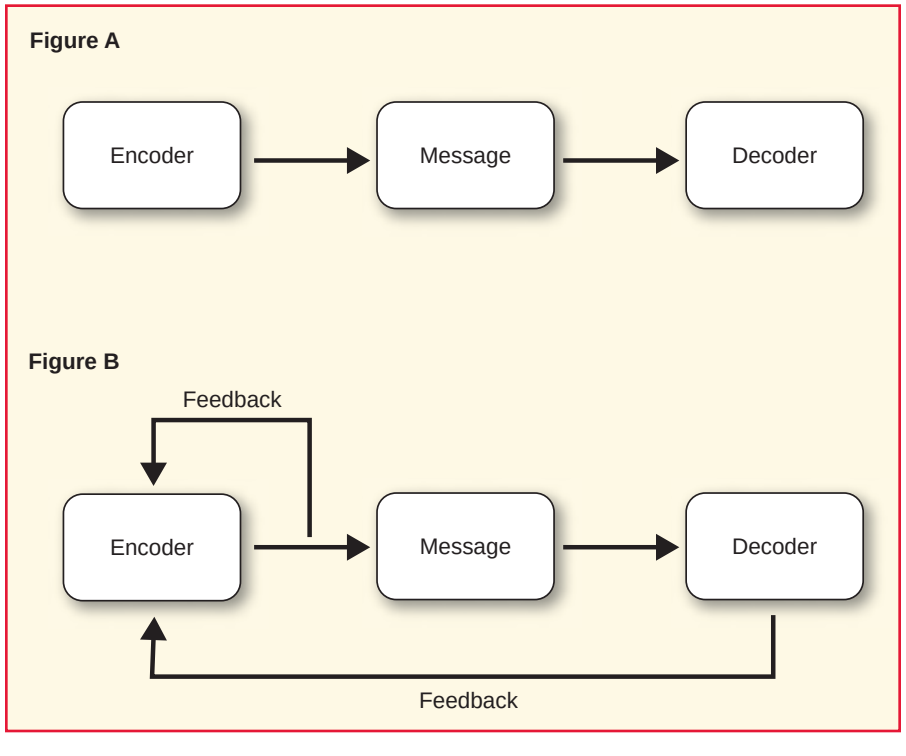


FIGURE 1–1. Models of communication. **A.** Classic transmission model of communication. **B.** Revised transmission model that includes feedback loops.

by Wilbur Schramm in 1954 through the inclusion of **feedback loops**. Feedback refers to the activity whereby information is sent back to the source from where the message came. As a reaction to this information, the speaker adjusts his or her message by strengthening, deemphasizing, or changing the content or form of the original message. The feedback can come from either the speaker or the listener. As speakers, we are constantly monitoring and evaluating our personal communication behavior. During the encoding of a message, we may revise our message mentally before actually speaking, or we may even choose to revise our message midstream to ensure the message is clearly presented. Feedback from the listener can take many shapes and forms. The listener may send nonverbal body language cues (e.g., eye contact, head nod) indicating that the message was understood, or the listener might simply state back to the original speaker that the message was not understood. The use of feedback is critical to the successful communication of messages. An example of the modified transmission model that includes feedback is shown in Figure 1–1.

A more detailed version of the transmission model was proposed by Denes and Pinson (1973) with particular reference to the linguistic and physiological contributions to speaking and listening. They referred to this model as the **speech chain** (Figure 1–2). According to the speech chain model, the process of encoding a message is organized across three levels: (1) linguistic (2) physiological, and (3) acoustic. The linguistic level is the first step in the speech chain, whereby the message is organized in the brain. It is the point in the chain where we think about speaking. Once we determine the message to be spoken, various motor nerves required to produce the sounds and

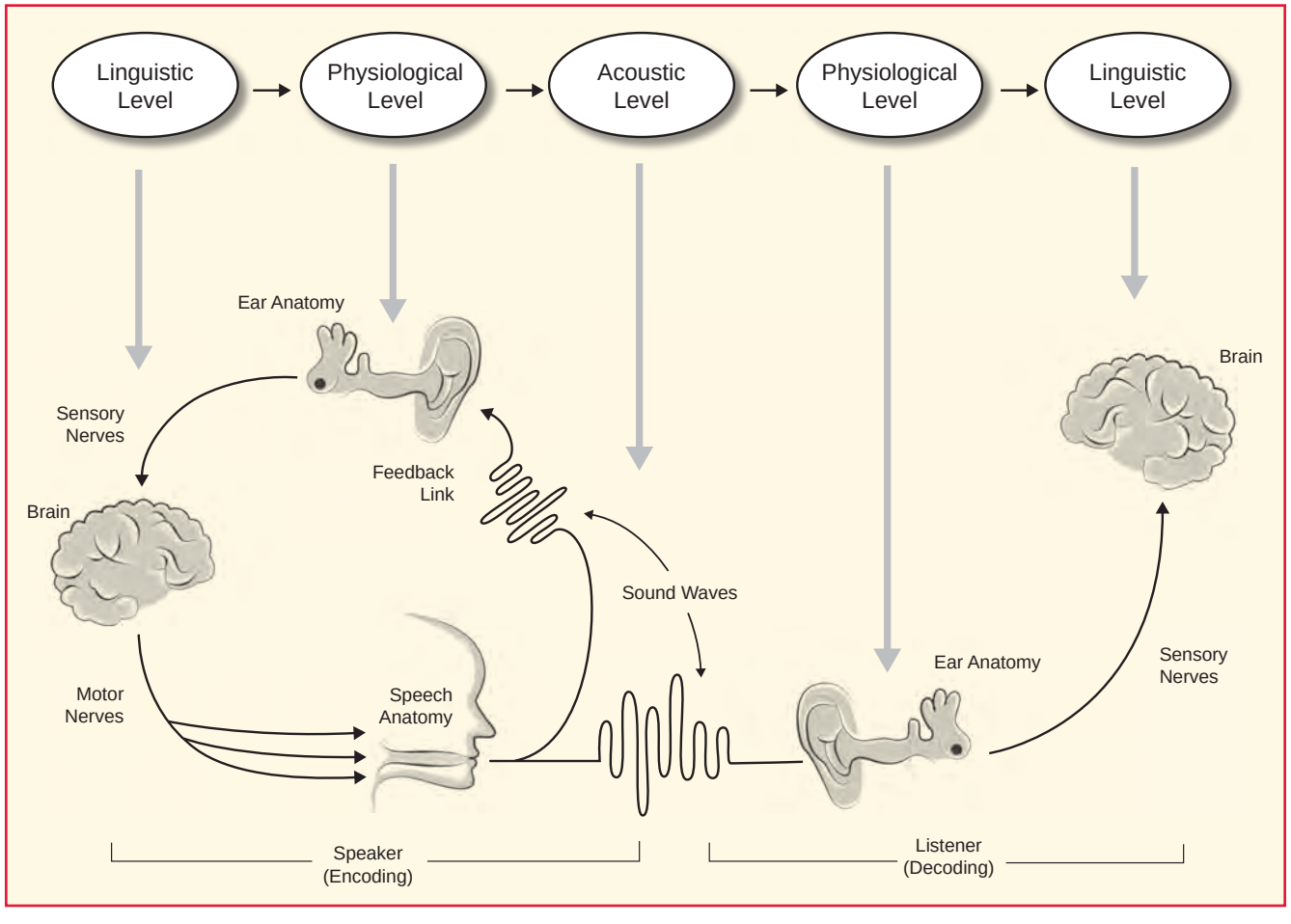


FIGURE 1–2. The process of communication depicted at linguistical, physiological, and acoustic levels.

words of the message send impulses from the brain to the speech musculature. Structures such as the lips, tongue, and jaw are set into motion. This physiological process represents the next link in the speech chain. Once these words leave our mouth, they become an airborne acoustic signal, thus representing the third and final link in the process (chain) of speech encoding. There is also a side, or ***feedback,*** link in the process of speech encoding. We naturally listen to our own voices when talking. By doing so, the message spoken is compared with what was originally intended to be spoken. An example of this type of feedback is evident when we produce a **spoonerism** (or slip-of-the-tongue). The phrase "mix up your words" spoken as "wix up your mords" is one such example. If we judge the message to be incorrectly spoken, the message can be modified and corrected The remaining links of the speech chain are related to the process of decoding.

The steps involved in decoding the message occur in the reverse order of those just described for speech encoding. When listening to a message, our ears are exposed to the acoustic signal after it leaves the mouth of the speaker. At a physiological level, the muscles, bones, and nerves of the ear transform this acoustic signal into electrical impulses along auditory (sensory) pathways leading to the brain. Once the sensory impulses reach the brain, they are deciphered into individual sounds, words, and sentences. This deciphering of the acoustic signal into a linguistic message represents the final link in the speech chain.

The speech chain model is useful to illustrate communication disorders. Any breakdown or disruption in the process of encoding that occurs along the pathway from the brain to the actual execution of speech can result in a communication disorder. Similarly, any breakdown in the decoding process between the ear and the brain can result in a communication disorder.

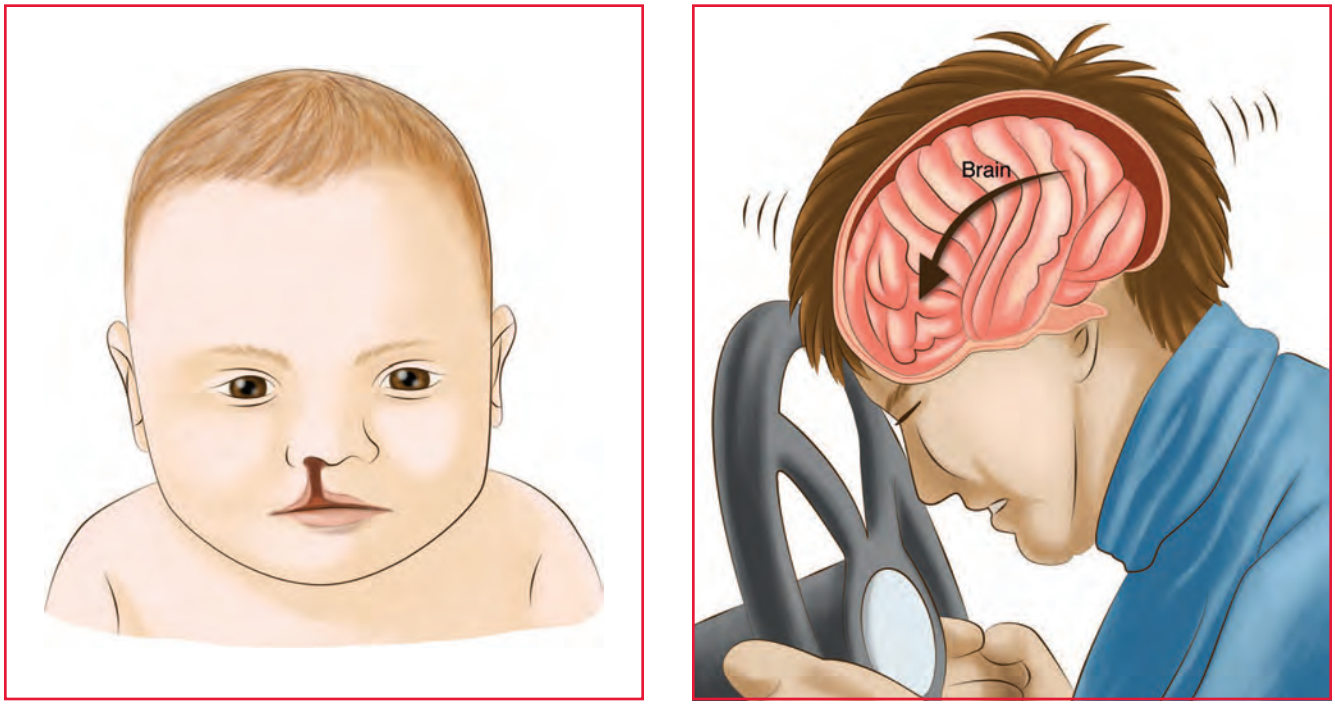
FYI

Many of the characters from the classic Looney Tunes cartoons were developed based on a speech pattern. Porky Pig produced speech with a stutter. Daffy Duck, Tweety Bird, and Elmer Fudd all produced speech with some form of unique articulation disorder.

Classification of Communication Disorders

Communication disorders can be grouped into two general categories. The first grouping is characterized by the timing of when the disorder first occurred. Specifically, did the disorder occur before or after birth? Any medical or health condition, including a communication disorder that occurs prior to birth, during birth, or shortly after birth, is referred to as a **developmental** or **congenital disorder**. An example of a developmental communication disorder is a child who is born with a cleft of the lip or palate (Figure 1–3). This cleft, if left unrepaired, can greatly impair speech production. The second grouping of communication disorders is characterized by a medical or health condition found to occur later in life (i.e., after birth); if that is the case, the disorder is referred to as an **acquired disorder**. Most often, an individual with an acquired communication disorder demonstrates normal communication prior to experiencing the disorder. An example of an acquired communication disorder is an individual who suffers a traumatic brain injury following a motor vehicle accident (see Figure 1–3). As a result of this accident, the individual may experience a marked impairment in the ability to produce or understand speech. Prior to the accident, the person's communication most likely was normal.

Communication disorders can also be classified by the cause (i.e., **etiology**) of the disorder. A medical or health condition with a known physical cause is called an **organic disorder**. In most cases, the physical condition is visible to the naked eye. Such is the case in a typical 7-year-old child who has lost her two front (central incisor) teeth. This condition is likely to pose a problem for the correct articulation of speech sounds that involve these physical structures (e.g., /s/ and /th/ sounds; Figure 1–4). An organic disorder, such as an impairment resulting from a brain abnormality (e.g., a stroke), can be invisible to the naked eye. If there is no known anatomical, physiological, or neurological basis for the observed disorder, the



A B

FIGURE 1–3. Examples of developmental and acquired communication disorders. **A.** Shows a child born with a cleft lip and palate. **B.** Depicts an individual with a head injury resulting from a motor vehicle accident.

FIGURE 1–4. Example of an organic communication disorder found in most normally developing children. The absence of upper central incisors is likely to affect speech sound production, but only temporarily.

term **functional disorder** is used. A closely related term is **idiopathic**, which denotes a condition that has an unknown cause. School-age children who mispronounce speech sounds, such as "wabbit" for "rabbit," and who show no apparent physical problems would be classified as demonstrating a functional communication disorder. A number of communication disorders have no readily identifiable cause. Although we may not know the precise cause of these functional disorders, they still can be successfully treated. An illustration of the overlap of developmental and acquired disorders that have a functional or organic basis is shown in Figure 1–5. These terms can be used collectively to refer to communication disorders. The ensuing chapters categorize each type of communication disorder according to both the timing and cause of the disorder.

A final comment about classifying communication disorders relates to the way we may label a person who is demonstrating a disorder. In the past, it was common to reference the disorder (or label) first and the person second. For example, we might have referred to an individual as being

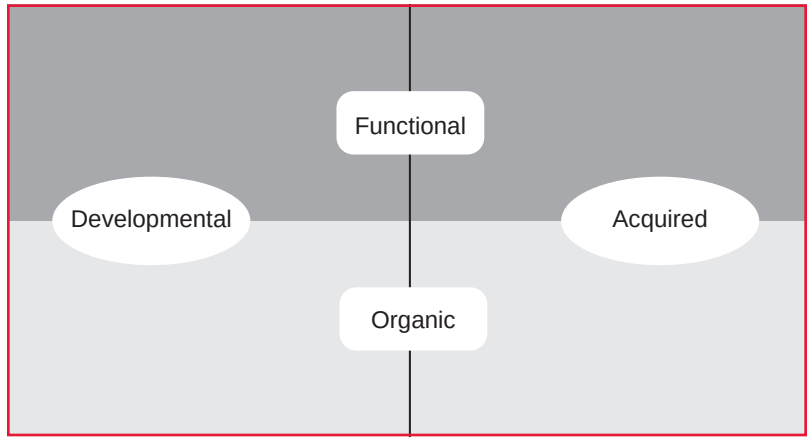


FIGURE 1–5. Categorization of communication disorders according to when the disorder occurred (developmental vs. acquired) and how the disorder occurred (functional vs. organic).

a "cleft palate child." In other instances, an individual was simply labeled by the disorder, where we referred to the person as a "stutterer." These days, the more appropriate manner of referring to a communication disorder is to recognize the person first and the disorder second. So as professionals in the field of communication disorders, we may encounter a child *with* a cleft palate or a person *who* stutters. Clearly, this form of labeling is not unique to communication disorders. In practice, placing the individual first should be applied when referring to any medical or health-related condition.

Occurrence of Communication Disorders

Epidemiology refers to the study of how often diseases and conditions occur in people and why. A common way of charting the occurrence of a disorder or disease is in reference to the overall population. **Prevalence** is a frequently used epidemiological measure of how commonly a disease or condition occurs in a population at a particular point in time. The prevalence is calculated by dividing the number of persons with the disease or condition at a particular time by the number of individuals examined. Prevalence often is expressed as a percentage. The **incidence** of a disease is another epidemiological measure. Incidence measures the rate of occurrence of new cases of a disease or condition, and is likewise expressed as a percentage. Incidence is calculated as the number of new cases of a disease or condition within a specified time period (usually 1 year) divided by the size of the population. So prevalence is a measure of all the cases of a disease at a point of time, and incidence is the measure of new cases of a disease in a time period. In the context of communication disorders, prevalence refers to the estimated population of people who are managing communication disorders at any given time, whereas incidence refers to the annual diagnosis rate of new cases of communication disorders.

Most epidemiology information on communication disorders relates to prevalence. Approximately one out of every seven individuals has some form of a communication disorder. This number encompasses disorders of either speech or hearing, ranging in severity from mild to profound. The prevalence of communication disorders in the United States is about 46 million people. Approximately 2.7 million Australians have a communication disorder. There are also prevalence data regarding certain types of communication disorders, which might be further categorized by age groups. Specific prevalence information for various communication disorders is presented in Chapters 3–12. Some types of communication disorders occur more often than others. For example, 2.5 million people in the United Kingdom are estimated to have speech and language disorders. Of this number, 800,000 have a disorder