INTRO

A Guide to COMMUNICATION SCIENCES *and* DISORDERS

FOURTH EDITION

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FOREWORD TO THE FIRST EDITION

Prior to his passing, Professor John H. Saxman (1938–2023) was intending to pen the Foreword to the fourth edition of INTRO. In memory of his contributions to the profession and support of this book, his original Foreword to the first edition is provided below.

Welcome to the fascinating and complex fields of speech and language pathology and audiology. These two professions are applied fields that draw on theory and knowledge from a variety of disciplines that support the practices devoted to prevention, assessment and evaluation, and treatment of disorders of speech, language, and hearing across the life span of human beings. This textbook provides the beginning student with an understanding of the basic conceptual and content knowledge and the vocabulary necessary to appreciate the complexity of human communication disorders. Within the crowded arena of introductory textbooks, there are a number of features of this text that make it particularly appealing, not the least of which is the sole authorship by Professor Robb. The distinct advantage of one author is that the perspective across the various topics is consistent and presented in a cohesive organization and level throughout. Capturing the right level is important for an introductory text, and Professor Robb has done so based on his years of teaching the course for which this text is intended.

There are additional features of this text that add to its appeal. These features are in its contextualization. I applaud the approach the author takes to provide a context for both speech-language pathology and audiology within the broadly defined communication sciences. The scope of practice within each profession engages activities not directly targeted at communication, such as swallowing or intraoperative auditory assessment; however, the raison d'être of these professions is situated in human communication. The inclusion of historical referents within each chapter is another appealing feature, which gives the beginning student a perspective on how the contemporary fields have evolved from the contributions of earlier scholars working in different disciplines such as physics, engineering, phonetics, psychology, medicine, and philosophy. The historical references also allow the student to appreciate the tremendous advances in technology that assist the current speech and hearing scientists and practitioners to better understand and serve individuals with communication impairments. Finally, the text is written with full recognition that students around the world are preparing for careers in speech and language pathology and in audiology. Although the education and training will follow different models and the practice requirements might be different in various countries, the core substance of the fields is essentially the same. The text limits its discussion to the English-speaking communities but clearly addresses the relevant multilingual/multicultural issues. Here the author brings his personal experience from teaching the introductory course in the United States and New Zealand.

A few observations about the communication context are in order. The overview of communication helps the reader appreciate the fundamental role of communication in all of nature. The most common definitions of communication involve some description of a mutual exchange of information or energy between two entities with varying degrees of elaboration of the process and its outcomes. A definition of this sort reminds us that communication is a universal among living entities ranging from the biochemical exchanges of unicellular organisms to complex symbolic systems such as language in humans.

The simple three-component model of communication (a sender, a communication channel, and a receiver) adapted from Shannon and Weaver has the advantage of identifying the major functional components involved in the act of communication. The model is an abstraction of the factors that influence and define the communication outcome. Applying this model to human communication and its disorders requires the specific knowledge of how the communication partners, who are both senders and receivers, acquire and use natural language abilities and what factors can impair the ability to acquire and use language for effective communication. That, of course, leads beyond the abstraction of a communication model to the primary content of this textbook. The content is an elaboration on the specifics of the human language user in a social milieu and the disorders that disrupt communication through problems that can originate anywhere within the communication dynamic. The human communicator is more than a "source code" generator and interpreter in an information system process and therein lies the nexus of communication sciences and disorders as a discipline of study.

Communicating with others is such a common experience that we give little thought to how it is accomplished. Because we are so familiar with being communicators, we generally are unaware of the learning and practice that went into developing the necessary communication skills that began as early as while still in the womb. We easily use different modes of communication available to us in our daily activities and only on occasion or in very limited circumstances do we experience the challenges of impeded communication. The situation is quite different, of course, for the person who has a communication disorder. The nature of the communication disorder and its consequences for the individual who experiences it depend on a host of interacting factors: organismic and environmental, developmental and acquired. The learning objectives stated for each chapter in this text appropriately focus on understanding the nature and consequences of the major disorders and their treatment in human beings.

Finally, it is appropriate to recognize the importance of the author 's experience in the education of students at all levels of their apprenticeship in the field. Because he has taught beginning students in a career spanning several decades, he is familiar with the changing learning culture and mode of today's student. This experience is realized in the writing style and learning aids used throughout the text. In addition to his significant contributions as a teacher, Professor Robb has maintained an active research and scholarship agenda that gives him further credibility as an authoritative escort for beginning students in their introduction to the field. On a personal note, it is a unique pleasure for me as I approach the close of my academic career to acknowledge a treasured friend and former student for his achievement in producing a book that promises to stimulate the development of many future careers in communication science and disorders.

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PREFACE

Since the original 2010 publication of *INTRO: A Guide to Communication Sciences and Disorder,* the book remains unique in many ways from other introductory texts. The structure of the book is consistent across chapters to assist beginning students in grasping new vocabulary and concepts. Each chapter 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. A portion of each chapter is dedicated to diverse and 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, the United Kingdom, the United States, and New Zealand. The chapters include a series of FYI (for your information) items, which present interesting and novel information about the topic area. Websites are listed at the end of the chapters to provide students with an opportunity to learn more about each topic. Many of these websites provide up-to-date links to streaming video examples.

This fourth edition of *INTRO* has been expanded from 13 to 15 chapters. The original chapter covering neurogenic communication disorders has been divided into separate chapters on neurogenic language disorders and motor speech disorders. A new chapter on the ever-expanding topic of autism spectrum disorder is new to this edition and provides more comprehensive coverage of the range of developmental communication disorders.

Being the sole author of this book ensures a balanced writing style that is missing from existing introductory texts. My intent is to deliver clear and concise information for students wishing to learn the fundamentals of the myriad of communication disorders that occur across the life span. For some, this information will serve as a springboard for pursuit of a professional career in audiology and 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. Students and instructors alike should be pleased with this new edition of *INTRO.*

As in previous editions of the book, there are some individuals I wish to thank. I am particularly indebted to Ray Kent who encouraged me to write a book of this kind and provided valuable oversight throughout its creation. Most of the illustrations throughout the book were made possible by the tireless work of Chia Pan. My initial exposure to the field of communication sciences and disorders was provided by my mother, Mary Jo Robb, whose professional career was spent educating children. During my first year of university study, she introduced me to one of her colleagues, a school-based speech-language pathologist. After our meeting, I changed my university major to communication sciences and disorders and never looked back. Finally, there was no one more influential in shaping my career than John Saxman (1938–2023), who passed away during the final stages of this book revision. He was a soft-spoken, kind-hearted individual who was a superb mentor, good friend, and best man. Thank you, John.

—M. Robb

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.

KEY TERMS

Communication Disorder
Encode
Decode
Verbal Communication
Discussion
Dialogue
Debate
Nonverbal Communication
Paralanguage
Sign Language
Body Language
Tactile Communication
Proxemics
Physical Appearance
Model
Transmission Model
Feedback Loops
Speech Chain
Spoonerism
Developmental or Congenital Disorder
Acquired Disorder
Etiology
Organic Disorder
Functional Disorder
Idiopathic
Epidemiology
Prevalence
Incidence
Speech-Language Pathology
Audiology
Speech-Language Pathologist
Audiologist
John Thelwall
Alexander Melville Bell
Alexander Graham Bell
Visible Speech
Henry Sweet
Hermann Gutzmann
Logopedics
Wilhelm Wundt
Edward Wheeler Scripture
Carl Seashore
Samuel Orton
Lee Edward Travis
Charles Van Riper
Max Steer
Sara Stinchfield Hawk
Raymond Carhart
Hallie Quinn Brown
Itinerant Speech-Language Pathologist
Acute Care Hospital
Rehabilitation Hospital
Telehealth
Ethical Behavior
Code of Ethics
Beneficence
Nonmaleficence
Evidence-Based Practice
Culturally Competent
Culturally Responsive

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 they want 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 put, 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 life span—from children to adults. In addition, the professions dedicated to helping individuals with communication disorders are profiled.

FYI

The most widely used language in the world is Mandarin with more than 1.2 billion 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 most 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 successfully 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 communication act as well as the formality of communication. Acts of verbal communication include (a) discussion, (b) dialogue, and (c) 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 communication 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 spoken or heard. There are at least six different types of nonverbal communication that we use and experience daily. These include (a) paralanguage, (b) sign language, (c) body language, (d) tactile communication, (e) proxemics, and (f) 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 15.

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 needs to 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 in. and 4 ft. In contrast, the personal distance needed when speaking to a crowd of people is around 10 to 12 ft. Our **physical appearance** plays an important role in communication. Physical appearance such as clothes and hairstyle serve to convey a message regarding a person's attitude, mood, wealth, and cultural background, which subsequently affects the judgment and interpretations of others.

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.

The first vocalization produced 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, then a failure in communication takes place. A modification of the transmission model was proposed 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 their 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 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 specific 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: (a) linguistic, (b) physiological, and (c) 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, the various motor nerves required to produce the sounds and 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.

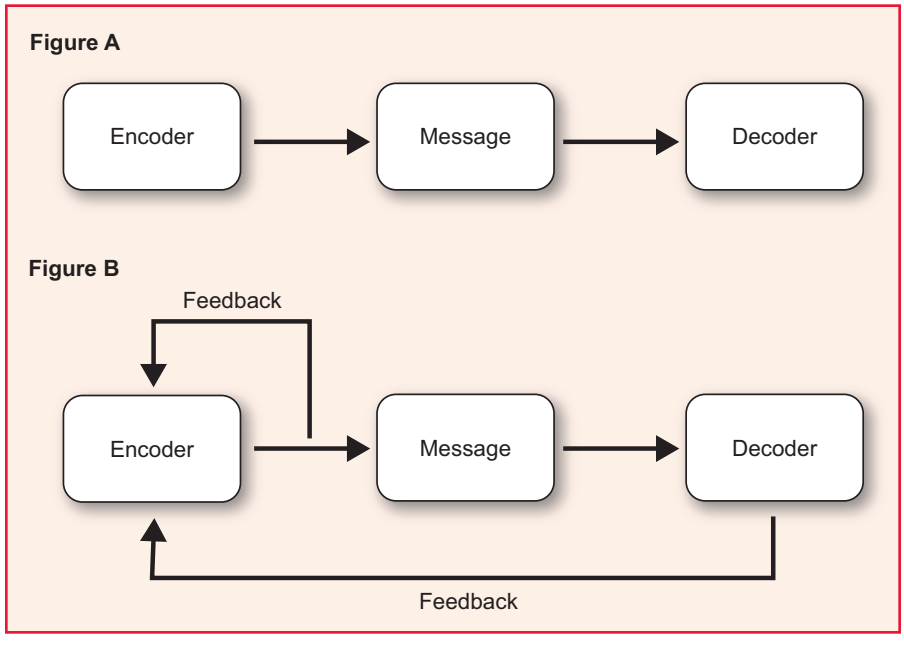


FIGURE 1–1. Models of communication. **A.** Classic transmission model of communication. **B.** Revised transmission model that includes feedback loops.

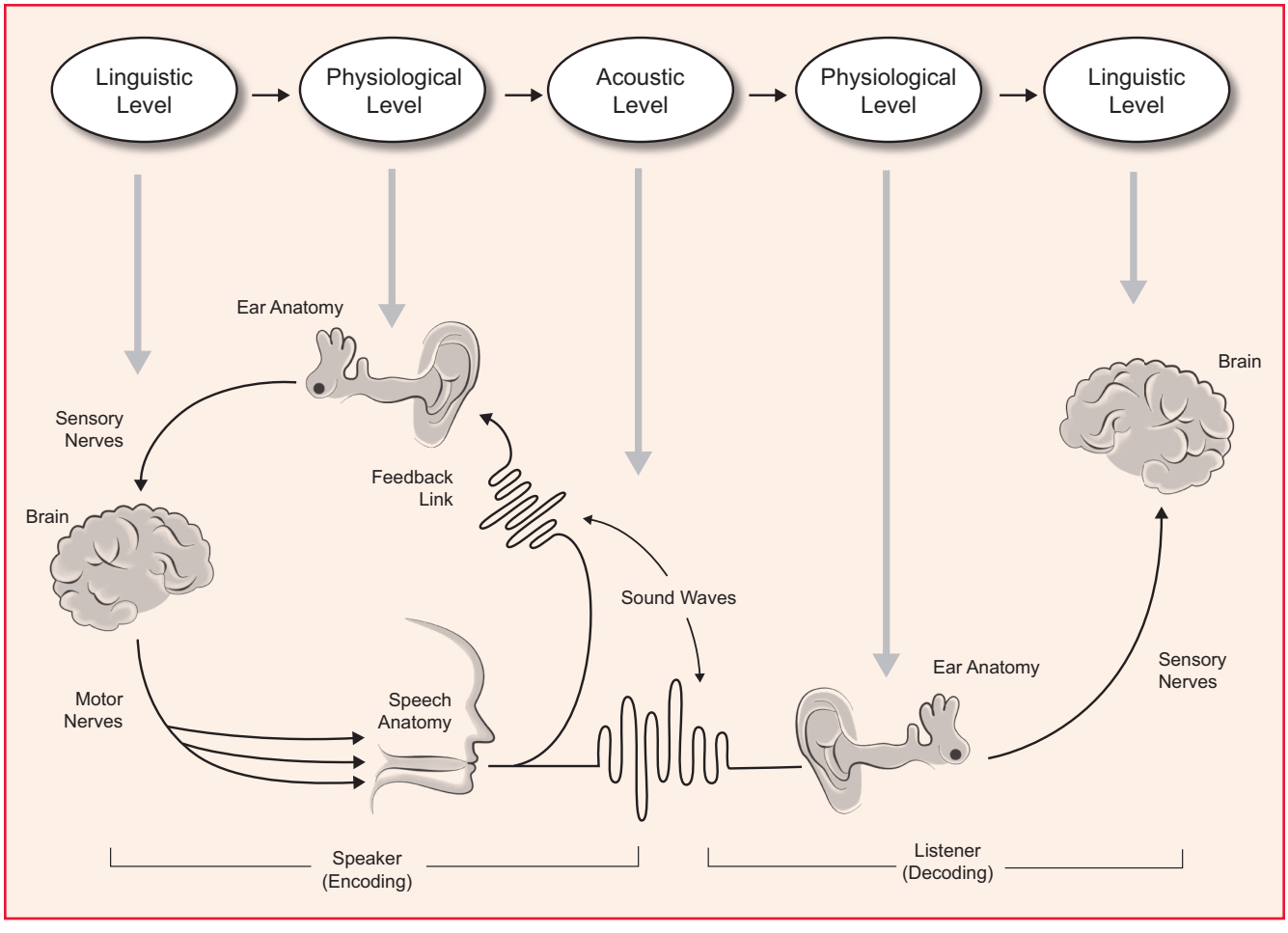


FIGURE 1–2. The process of communication depicted at linguistical, physiological, and acoustic levels.

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

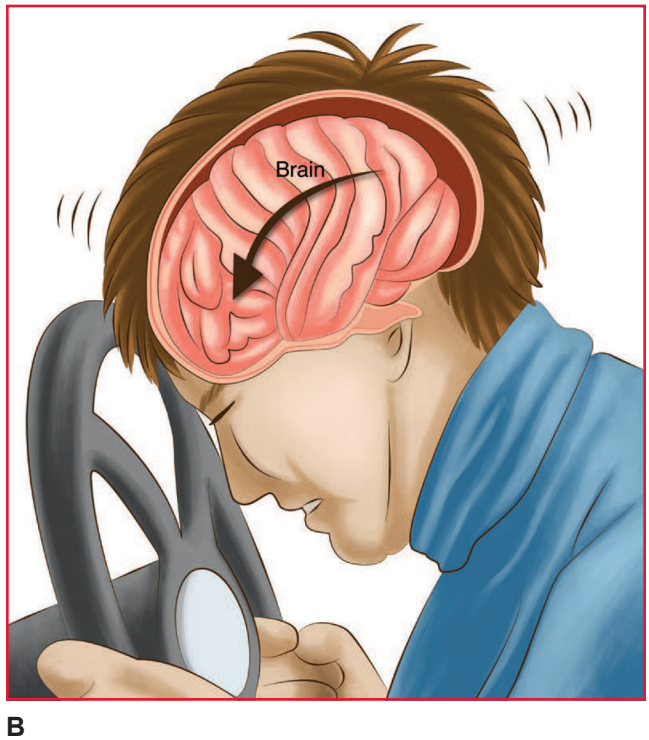
Many of the characters from the classic Looney Tunes cartoons were developed based on a speech pattern. Porky Pig produced speech with a stutter. Daffy Duck, Tweety Bird, and Elmer Fudd all produced speech with some form of unique articulation disorder.

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 1–3A). This cleft, if left unrepaired, can greatly impair speech production. The second group 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 (Figure 1–3B). 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

A



B

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

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 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. Several 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.

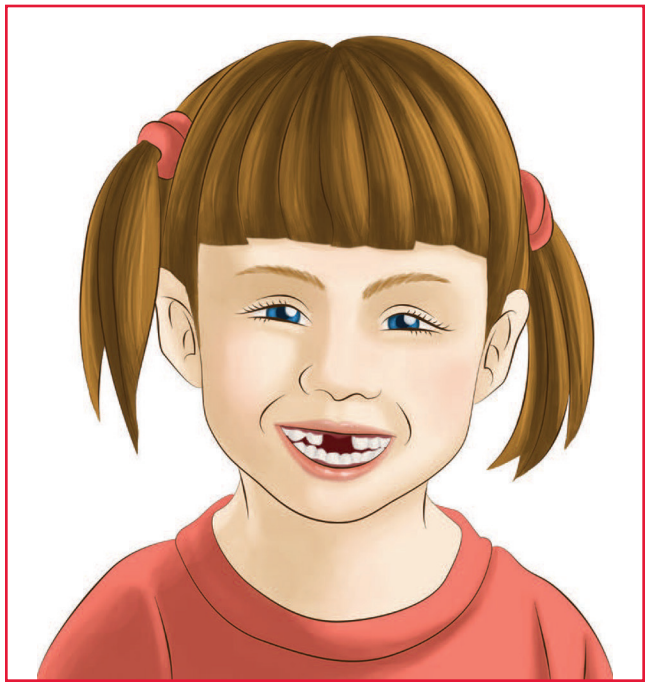


FIGURE 1–4. Example of an organic communication disorder found in most normally developing children. The absence of upper central incisors is likely to affect speech sound production, but only temporarily.

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 a "cleft palate child." In other instances, an individual was simply labeled by the disorder, where we referred to the person as a "stutterer." The more appropriate manner of referring to a communication disorder is to recognize the person

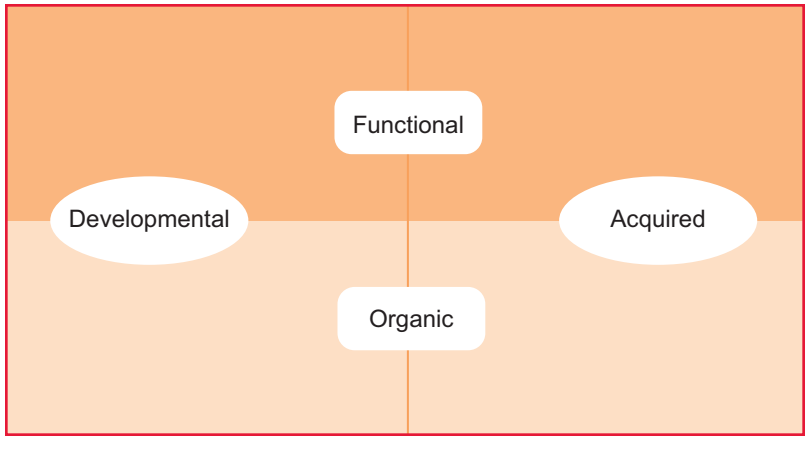


FIGURE 1–5. Categorization of communication disorders according to when the disorder occurred (developmental versus acquired) and how the disorder occurred (functional versus organic).