# Speech Sound Disorders

## FOR CLASS AND CLINIC

Fifth Edition

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# Preface

Welcome to the fifth edition of *Speech Sound Disorders*! This edition contains new chapters, updated and revised chapters, many new teaching aides, and new milestones.

## New Chapters

The fifth edition has added three new chapters on treatment approaches, motor learning, and working with late sounds in Spanish:

- *Treatment Approaches* by Blair M. Voigt
- *Motor Learning* by Carlin Hageman
- *Late Sounds en Español* by Lindsey Squires

The chapters on motor learning (Chapter 19) and late sounds in Spanish (Chapter 20) originally appeared in a book I wrote called *The Late Eight,* which has been made obsolete by recent (and very welcome) advances in the profession (see Chapter 9 for discussion). A very informative podcast accompanies Chapter 19 on motor learning by Carlin Hageman. Accompanying Chapter 18 on treatment approaches by Blair M. Voigt are demonstration videos and spoken narratives explaining what the students are seeing. The videos and narratives are *very* popular with students.

## Updated and Revised Chapters

All the chapters have undergone revisions to describe recent advances and to update references. Three chapters have undergone especially extensive revisions:

- *A Speech Framework* (formerly *Speech*) (Chapter 1)
- *Infants* (Chapter 6)
- *Developmental Goals* (Chapter 16)

In the fifth edition, the *Infant* chapter has gained a new co-author, Samantha Ehler.

## New Teaching Aides

Every author-written chapter now has an accompanying two-part recording, each about 10 minutes long, which summarizes the chapter's main ideas. The recordings can be listened to as podcasts or viewed and listened to as PowerPoint presentations, depending on whether the user's learning preference is auditory or auditory–visual. Note helpers accompany the recordings, and each chapter concludes with a 10-point review quiz.

I believe the recordings, note helpers, and quizzes combine to greatly improve students' ability to come to class ready to engage in more in-depth learning and discussion.

## New Milestones

A final feature of this edition is the inclusion of updated developmental speech milestones that incorporate the latest information from multiple languages. The cumulative effect of this information is to suggest that children acquire speech earlier in their lives than previously believed. The new milestones have the potential to have a major impact on determining eligibility for clinical services.

My colleagues and I wrote this book and its previous editions to support those who help children learn to talk. We hope you find it a helpful adjunct in your important work!

Best wishes!
Ken M. Bleile

# Companion Website Resources

On the PluralPlus companion website, you will find the following additional resources. See the inside front cover of your book for the URL and access code.

## For Instructors

- A bank of 200 objective questions with answers covering main ideas in chapters
- PowerPoint slides with noncopyrighted pictures covering the main ideas in chapters
- Answers to exercises in the "learn by doing" chapters

## For All Book Readers

- Recordings that summarize main ideas in all the chapters written by the author
- Note helpers for chapters and recordings by the author
- Every recording concludes with 10 review questions of main ideas in the chapter

## Assessment Resources

- Questions to help assess social impact of communication
- Procedures to measure severity and intelligibility
- Lists of developmental milestones from infants through students
- Tools for informal speech assessments from toddlers through students
- A selection of published tests

## Treatment Resources

- A 20-minute audio presentation on motor learning
- 15 brief narrated treatment videos of children with speech sound disorders
- Descriptions and demonstrations to help teach every consonant
- Over 100 phonetic placement and shaping exercises
- Hundreds of activities for infants, toddlers, preschoolers, and students to promote speech during play, in daily life and school, in reading, and in language

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Thank you to friends, colleagues, and email correspondents who have generously shared your ideas, questions, and clinical experiences with me over the years. I give special thanks to the wonderful photographers who generously share their art at Pexels.com; almost all the photographs for the podcasts/PowerPoint presentations come from that remarkable source. Lastly, I thank my brother and sisters, living and gone (Henry, Cheryl, and Judy), and my wonderful children, Jude and Zoe. I wrote the first edition of this book when my first daughter, Jude, was a baby (a picture with her in my arms appeared on its back cover). As I finish revising the book's fifth edition, she is now 29 and my younger daughter, Zoe, is 23. They are the adventure of my life.

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CHAPTER 1

# A SPEECH FRAMEWORK

The world is brimming with fascinating topics, from subatomic particles to supernovas, from Zen to the Zen of baking. Why devote time and energy to study short bursts of sound that pop from your mouth, one after another? Of course, one reason may be someone told you to, perhaps saying something like, "Please read Chapter 1." Since you want to pass the course, you read about a speech framework. However, the "Why?" intended here is of a different sort, something you might paraphrase as, "Why am I learning this stuff when I could be studying ___?" (You fill in the blank.)

This chapter establishes a framework within which to help a child with a speech sound disorder. The chapter addresses these topics:

- The dual nature of speech
- Speech in language
- Speech as a channel of communication
- A final thought: giving back

Subsequent foundation chapters discuss speech sound disorders, speech production, and speech reception and perception. The section concludes with a "learn by doing" chapter to help brush up possibly rusty phonetic skills.

## Learning Objectives

I hope on completing this chapter you will:

- Understand that speech has a dual nature
- Know the central role that speech plays in human language and culture
- Better understand speech as a channel of communication
- Appreciate the role of our profession in the study of speech

## Key Words

Key words you will encounter in this chapter:

Accent
Articulation
Code switching
Cultural transmission
Dialect
Dual nature of speech
Group identity
Phonology
Sociolect
Speech perception
Talk
Theory of mind
Thought

## The Dual Nature of Speech

Speech has a dual nature, being both an aspect of language and a channel of communication (Hockett, 1960). The book follows established practice in further dividing the channel of communication into two domains: **articulation** (the motor part of the channel) and **speech perception** (the perceptual part of the channel).

Children may experience challenges in learning either the language side of speech or the channel side of speech, or both. The dual nature of speech is the basis of the conceptual distinction between phonology and articulation, and, as we shall see in Chapter 2, the basis of the difference between phonological and articulation disorders.

## Speech in Language

A child's speech disorder is important to their family in large part because caregivers intuitively grasp that speech plays a central role in language and, through language, in human communication. Knowing this, they may worry—with some justification—that their child's speech disorder could exclude or limit them from enjoying and participating in some of life's most important activities. To carry out our work, we need to study in more depth what families correctly intuit about the importance of speech.

### Phonology

In this book, **phonology** is the knowledge of language rules that underlie speech. Examples of phonological elements include distinctive features, phonemes, syllables, stress, and intonation. The essential characteristic of these and other elements in the phonological system is that they lack meaning. To illustrate, *s*, *t*, and *m* have no meaning in themselves, but other language systems recruit them to create meaning. For example, combined with other consonants and vowels, they make words such as *sun*, *see*, *tea*, *toe*, *me*, and *myth*.

Consonants, vowels, syllables, and intonation may seem mundane, relatively insignificant aspects of language, but they make the rest of language possible. Because the foundation of our language is meaningless sounds that represent nothing, words can create a nearly infinite number of different meanings, allowing us to express whatever meanings are important in our social and physical environments.

### Phonology Means Nothing

To appreciate the role phonology plays in human language, imagine it organized differently. For example, pretend that each consonant and vowel, instead of being meaningless, is associated with a meaning. For example, suppose *s* represents *anger*, *w* represents *sadness*, and *t* represents *touch*. If this were so, *s* could not appear in *sweet* or *sun*, or other words, since *s* always represents *anger*.

If phonology had a similar organization, humans could express very few different meanings. In fact, the world of different things to talk about would closely equal the number of sounds we could produce. To illustrate, if our vocal tracts could pronounce 120 different sounds, we could talk about approximately 120 different things—one thing per sound.

You can perform a quick thought experiment to see just how restricted life would be if you could only talk about 120 things, one per each sound your vocal tract could produce. Counting to 100 uses up 100 of your 120 meanings. The alphabet of an English-like language uses 26 meanings, so you're already over your limit of 120. And you haven't even gotten to colors, grammatical markers, the weather, favorite and dangerous foods, family members, flowers, or features of the landscape.

And then comes the real problem of the limit to 120 meanings: How do you name something new in your environment? For example, suppose you and your family live in a little house on a dangerous animal-filled savanna (I don't know why you are living there—let's just say you are) and a new predator enters your area. You would like to be able to name it—in fact, your survival may depend on doing this, so you can warn others in your family of the animal's approach. To name it, some other meaning would need to go to keep to your limit of 120 meanings. What do you choose to drop? Only count to 99? Drop the first letter of your alphabet? Discard the name of a family member? I'm sure you see the point: Human life with such limitations would be impossible.

### Defining Ourselves

In no small measure, human adaptability depends on possessing a language system that allows the expression of an almost infinite number of meanings using a small set of sounds. This allows humans to enter a new environment and create vocabulary to describe the place in which they find themselves. This has allowed humans to spread out across the world and flourish in such diverse places as deserts, mountains, forests, and tundra. Just as easily, phonology would allow us to live on a satellite, the moon, or a distant planet.

Indeed, phonology is so critical to language and being human that we could define ourselves in the following way:

*Humanity is the species whose cornerstone of communication means nothing.*

That is, humanity is the species whose language includes phonology.

## Speech in Human Communication

Through language, speech plays a central role in human communication. To see this, think of all the things we could not accomplish, or could only accomplish with much greater effort, if speech did not exist to convey language. As summarized in Table 1–1, speech facilitates talking, thinking, being part of a group, and transmitting knowledge from generation to generation.

**TABLE 1–1. Four Types of Communication Facilitated by Speech**

| Type of Communication | Definition |
|---|---|
| Talk | Communication between persons |
| Thought | Communication with oneself |
| Groups | Communication within and between groups |
| Cultural transmission | Communication between generations |

## Talk (Interpersonal Communication)

When someone thinks about the role of speech in communication, they usually think of **talk**, which is the way people typically communicate with each other (Carroll, 2008). Stand back and watch a conversation. A person's mouth opens, emitting a volley of sound. Then another person's mouth opens and returns a sound volley. As Fillmore (1975) described years ago, the volleys continue, back and forth, back and forth, conveying ideas, memories, and emotions.

Approximately 7,099 different languages exist in the world, a remarkably large number considering they all belong to a single species with the same cognitive system (Ethnologue, 2017). In each of these languages, the primary means of communication is the exchange of sound. Many languages have written systems in addition to spoken ones, allowing the translation of speech into graphic mediums. Modern inventions such as the telephone, computer, film, and television have extended the realm of speech to transmission through electricity.

Of course, speech is not the only form through which humans convey language. Other means include sign language, in which the volleys are gestures rather than sounds (Sacks, 1989; Stokoe, 2005). Although the gestural volleys of sign language are as fascinating to study as those of sound, that intriguing topic lies outside the purview of this book. Nor does this book address fascinating gestural communication systems such as eye gaze and stance, though those forms of communication are rich and increasingly well researched topics (Burgoon et al., 2011).

## Thought (Intrapersonal Communication)

In addition to its central role in talk, speech plays at least three other pivotal roles in human communication. Speech turned inward conveys **thought** (Kozulin, 1990). Internal speech and images allow humans to regulate their own behavior, make plans, and reason (Huettig & Harsuiker, 2010). Indeed, sometimes a person does not turn their speech all the way inward and you can hear them muttering, sometimes in whole sentences, though more often in short snatches.

If you introspect, you can mentally overhear speech in your head, perhaps whispering dinner possibilities or planning what you will say to a friend this evening. Or, if

you are preparing for an argument you expect with a significant other, the little whisper allows you to play both sides of the projected conflict, a sort of mental script like this:

***Mental Script:***

Me: You don't treat me well!

Significant Other: I do too!

Me: We never go out to dinner anymore.

Significant Other: We do too. We went to dinner on your birthday.

*Oops. They're right. Revise the script.*

***Revised Mental Script:***

Me: You don't treat me well!

Significant Other: I do too.

Me: We never go out to dinner anymore, except on my birthday.

Significant Other: Well, I don't have much money.

Me: That's no excuse.

*Good! Much better outcome.*

You may notice that inner speech requires some mind reading. In the above example, "me" not only plans their own utterances, but also mind reads what "Significant Other" likely will reply. The scientific name for this mind-reading trick is **theory of mind**, which essentially means that we act on the assumption that other people have minds, thoughts, wishes, and motivations, just as we do (Firth & Firth, 2005). Theory of mind guides our use of language; difficulties with theory of mind are part of many different communication disorders, including autism spectrum disorder (Schmaafsma et al., 2015).

Lastly, you may notice that inner speech takes a person out of the moment in which they live and projects them elsewhere—in the example, "me" projects themself into the future. A goal of many meditation practices is to turn off the inner voice so a person may experience more of the now (Lazar et al., 2000). It is not easy! To see this, try turning off your inner speech and look around the room in which you are reading. The voice disappears after a few moments, but soon returns, a little whisper. You can turn it off again, but for most people it soon returns, taking you from the moment to other places.

## Groups (Intergroup Communication)

Speech also plays a central role in forming **group identity** (Gumperz, 1972; Wolfram, 2004). Being a native speaker of a language is a common way people view themselves as belonging to a group. For example, persons born in Spain may group themselves as native Spanish speakers in contrast to those with foreign **accents** that show they are nonnative Spanish speakers.

Shared speech characteristics of a **dialect** offer another means through which people place themselves in groups. In addition to dialects based on regions, people also may

share a dialect based on social relationships, called **sociolects** (Wolfram, 2004). Cockney English is a famous example of a dialect that is both regional and based on social class.

Race, ethnicity, sexual orientation, age, and gender all offer people other ways to build a group identity based on shared speech characteristics. To give just one example, teenagers with similar interests and outlooks may develop a slang (a temporary age- and interest-based dialect) to differentiate themselves from those outside their group. Persons within a dialect group may speak in their dialect with other members of their group and switch dialects when speaking to outsiders, called **code switching** (Wolfram, 2004).

Sharing a common language, dialect, or style of speaking facilitates cohesion within a group, evoking feelings of pride, shared history, and camaraderie (Trudgill, 1995). More negatively, a group may weaponize speech to exclude, mock, debase, or ridicule another group (Labov, 1972). When a group uses speech as a weapon, the attitude may be, "We are ___ (select a favorite adjective: good, superior, intelligent, moral, hip) because we speak this way, while you are ___ (select a negative stereotype: stupid, inferior, uneducated, ignorant, bad) because you speak that way."

### CLINIC BOX: Speaking Bar Bar

Judging people by their speech is not a recent cultural development. Greeks in antiquity divided the world into two groups: speakers of Greek and those unfortunate souls who spoke other languages. The Greek view was that the latter, unable to speak Greek, were inherently inferior and largely incapable of rational thought. They considered foreigners' speech to be mere noise, a sound they likened mockingly to saying *bar bar bar bar*, giving us the root of the word barbarian, or someone who speaks bar bar (Kitto, 1951).

## Generations (Intergenerational Communication)

Lastly, speech and its written forms are a primary mechanism through which a **culture transmits** what it considers necessary to know from one generation to the next, allowing a person to learn without direct experience. To illustrate, a parent may tell a child not to touch a hot plate, enabling the child to learn about burns without receiving one. In a broader way, cultures do the same. A few of the many things a culture may consider needful to pass on from one generation to the next include ideas about freedom, morality, and thousands of different technologies. Right this moment you are reading a book as a way of passing on accumulated knowledge of speech sound disorders.

Compared to instinct, speech permits change to occur much more quickly. To illustrate, imagine a terrible drought transforms a forest into desert. To survive in this new environment, an imaginary creature that lived entirely based on its instincts would likely take generations for gene mutations to adapt to the new circumstance. For a species that relies on speech and its written forms to transmit information between generations, all it must do is develop new words to describe what is needful to know in the new environment.