

# Speech Sound Disorders

FOR CLASS AND CLINIC

Fourth Edition



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# Preface

Welcome to the fourth edition of *Speech Sound Disorders*! I hope you find this to be a useful resource.

## Major features of this book include

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- Readable and practical discussions of complex clinical topics
- Coverage from infants to adults
- Clear link between speech development and clinical decision making
- Emphasis on underlying principles and procedures
- Student friendly

## Content revisions in this new edition include

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- About 80% updated and revised
- More treatment chapters
- Every chapter has learning objectives, key words, and review questions
- “Learn by doing” chapters with speech exercises from real children
- Chapters written by invited contributors on AAC, bilingualism, speech production, and speech perception
- More downloadable clinic resources

I wrote this book to support people who help children learn to talk. Whether you are a student who reads the book from beginning to end or a clinician who jumps to the resources and skims through an occasional chapter, if the book ends up marked, dog-eared, and rolled up in your pocket, it will have served its purpose.

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

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- Complete and main idea PowerPoint lecture slides
- Answers to the chapter review questions
- Answers to the “learn by doing” exercises
- Sample undergraduate and graduate course sessions and syllabi

## For All Book Users

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### Assessment Resources

*Social Impact*  
*Severity and Intelligibility*  
*Developmental Milestones*  
*Birth to 3 Years*  
*Students*  
*Informal Assessments*  
*Assimilations*  
*Phonological Processes*  
*Consonants and Consonant Clusters*  
*Preschool Consonant Screener*  
*Phonological Awareness Screener*  
*Published Tests*  
*Screening Tests*  
*Complete Tests*

### Treatment Resources

*Talking about Speech*  
*Descriptions and Demonstrations*  
*Phonetic Placement and Shaping*  
*Activities*  
*Birth to 2 Years*  
*Preschool and Grade School*  
*School and Daily Life*  
*Reading and Language*

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# Acknowledgments

This book has come full circle—I began the first edition in Iowa and finished the fourth edition in the same state. In between, I worked on book editions in Maryland (Johns Hopkins), Pennsylvania (Children’s Hospital of Philadelphia), Hawaii (University of Hawaii), and New Zealand (University of Canterbury). What an odd, wandering journey for a collection of words!

I thank the many people who helped put these words in order through the ideas and experiences they shared with me. I hope you recognize your influence in these pages and that what I wrote pleases you, at least in parts. Thanks especially to faculty, staff, and students at the University of Northern Iowa for your good company all these years. Lastly, I thank my brother and sisters, living and gone (Henry, Cheryl, and Judy), and my wonderful children (Jude and Zoe).

## CHAPTER 2

# SPEECH SOUND DISORDERS

This book is about helping people with speech sound disorders. This chapter addresses foundation topics such as:

- What Is a Speech Sound Disorder?
- Why Study Speech Sound Disorders?
- The Nature of Speech Sound Disorders
- Will This Help Someone?

### Learning Objectives

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I hope on completing the chapter you will

- Know the definition of a speech sound disorder
- Recognize that speech sound disorders may negatively affect people's lives
- Recognize health care disparities around the world
- Appreciate the difference between articulation and phonological disorders
- Understand the need for additional research to support clinical decisions

### Key Words

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Key words you will encounter in this chapter

Speech sound disorder  
Phonological disorder  
Articulation disorder  
Evidence-based practice (EBP)

## What Is a Speech Sound Disorder?

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A **speech sound disorder** is a type of speech difference. Of course, not all speech differences are speech problems, nor is every speech problem a speech sound disorder. A dialect, for example, is a speech difference, but not a speech problem, and a laryngeal anomaly may result in significant speech challenges, but those challenges are not a speech sound disorder.

A speech difference must meet three criteria to be a speech sound disorder:

1. The speech disorder arises during childhood and is not directly attributable to damage to the speech mechanism, sensory systems, peripheral nervous system, or central nervous system.
2. The speech is not the result of dialect or accent.
3. The child or members of the child's community consider it a speech problem.

### A Little More Detail

---

1. *The speech disorder arises during childhood and is not directly attributable to damage to the speech mechanism, sensory systems, peripheral nervous system, or central nervous system.*

**Explanation:** Speech sound disorders are different from speech problems arising directly from physical difficulties such as cranial nerve damage, unrepaired cleft palate, laryngeal anomalies, dysarthria, or difficulties in respiratory control. Of course, children with such physical difficulties may also have a speech sound disorder in addition to other speech problems.

2. *The speech is not the result of dialect or accent.*

**Explanation:** Speech sound disorders differ from speech variations attributable to dialect and accent. While a speech sound disorder is a learning difficulty, dialect arises from normal language variation and accent represents a learning accomplishment.

3. *The child or members of the child's community consider it a speech problem.*

**Explanation:** Individuals, communities, cultures, and ethnic groups may differ both in what they identify as disordered and in what they assign as a priority to remediate. That is, we are not “speech police” who decide for a person or a community what is and is not a speech sound disorder (McCormack, McLeod, McAllister & Harrison, 2010; Taylor & Peters-Johnson, 1986).

## Why Study Speech Sound Disorders?

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The first chapter discussed the central role of speech in human society. The implication is that speech disorders matter because they interfere with those essential cultural functions. While true, this is not why most of us assess and treat speech sound disorders. What motivates us is that such disorders negatively affect people's lives.



**CLINIC BOX: Did You Know?**

Within the United States, federal laws provide an overarching legal umbrella to protect children with communication disorders, but access and eligibility for services vary by state and health insurer. As a result, on one side of a state border a child may be diagnosed with a speech sound disorder (and be eligible for treatment), but, if the family drives over the state line or changes health insurance, the child may suddenly be deemed not to have a problem and be ineligible for services.

## Children's Lives

No matter where you go in the world, nearly everyone understands that to lead a rich and full life a child needs to communicate. Speech typically is the preferred form of communication, because it allows a person to live most widely in their community. A family in a developing country residing under a tin roof in a dirt-floor shack, cooking from a smoky wood-burning fire, understands this as clearly as a wealthy family in a luxury penthouse in Manhattan, Dubai, or Singapore (Bleile, 2009).

The following five examples of real children provide a “close up” of the many ways a problem in speech may impact a person’s life.

### Jose

Jose’s mother immigrated to the United States from Latin America as a young woman, seeking a better life for herself while sending money home to her family. She found work in restaurants, married, had a son (Jose), divorced, and afterward lived with her son.

Jose grew to be a teenager with a mild to moderate speech disorder affecting [l], [s], and [r]. Because he believed his speech kept girls from going out with him, Jose enrolled in his school’s speech treatment program, where he worked hard and had good attendance, except when treatment conflicted with his great passion—playing basketball on the school team.

One summer night when Jose was 15, police raided the restaurant where Jose’s mother worked. Jose’s mother was in the country illegally and the court began deportation proceedings. Returning to her home country would place them with her family, who lived in a rural area where unemployment was over 90%, electricity was intermittent, and health and education facilities were almost nonexistent. She wondered, *in such a place what will become of my son who sounds so different than his friends?*

### Joni

Joni was 5 when she started kindergarten. She was a bright child with a minor speech difficulty that changed “y” into “l” in words such as *yesterday*, which she said as *lesterday*. On the first day of kindergarten, Joni made several new friends. On the second day, as Joni approached her new friends, one said, “Look, it’s the *lesterday* girl.” Joni felt crushed.

### Margaret

Margaret was 5 years old and she had severe cerebral palsy and intellectual impairments. She lived in a developing country with her mother in a dirt floor home. Margaret's mother supported the family by selling trinkets and cigarettes on the street, typically earning less than a dollar a day, often less than twenty dollars monthly.

The most important thing in the world to Margaret's mother was her daughter. For that reason, when she heard that a clinic in the neighborhood provided evaluation services to children with communication disorders, she carried Margaret in her arms to the clinic. Her question to the evaluators was, "Will Margaret ever speak?"

### Martin

Martin was 2 years old and spoke four to five different words. The children of his mother's friends spoke several hundred different words at that age, and their pronunciations were much clearer.

At the end of a diagnostic session with a speech-language pathologist, the clinician explained that Martin had something called an expressive language disorder, and that he had a 50% chance of catching up to his peers by the time he was 3 years old (Paul, 1991). However, if he did not catch up, Martin was at risk for speech and language disorders during the preschool years and, possibly, for reading and language difficulties in school (Rice, Taylor, & Zubrick, 2008).

From the parents' perspective, if treatment might reduce the chance of a future speech, language, and reading problems, they were all in for treatment. However, their health insurer denied coverage, explaining, "Why provide speech services when Martin has a 50% chance of recovery without receiving any services at all?"

### CLINIC BOX: An Uneven Playing Field

The world is an uneven playing field for a person with a disability, including one in speech (World Report on Disability, 2011). To illustrate, in the world's poorer regions, a family in poverty may only be able to afford to send those children with "the best potential" to school (World Report on Disability, 2011). A child with a communication disorder, even one as mild as pronouncing a few late acquired sounds, is not typically one judged to possess "the best potential." Worldwide, 100 million children remain out of primary school, almost 60% of them girls (World Bank Group, 2005).

Many people around the world believe disability is a stigma created as a punishment from God or from a curse from someone who possesses supernatural powers (Human Rights Watch, 2010). If a culture associates disability with shame or believes it results from God's punishment or a shaman's curse, it is more likely to shut away a child with a communication disorder than to develop laws that mandate clinical services.

## Andrea

Andrea’s mother consumed narcotics heavily during her pregnancy, and Andrea was born addicted to crack cocaine. Drug withdrawal for Andrea began at birth. The hospital’s social worker recommended Andrea immediately begin to receive developmental services, including those for communication.

## The Big Picture in Nine Statistics

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The children in the previous examples—Jose, Joni, Margaret, Martin, and Andrea—offer a close-up view of speech sound disorders. The following nine statistics provide “the big picture”:

1. A speech sound disorder is the world’s most common type of communication disorder, affecting approximately 10% to 15% of preschoolers and 6% of students (American Speech-Language-Hearing Association, 2006; Campbell et al., 2003; Law, Boyle, Harris, Harkness, & Nye, 2000; Shriberg & Tomblin, 1999; Slater, 1992).

**What This May Mean:** If you choose to work in pediatric settings, expect your caseload to include many children with speech sound disorders.

2. Speech sound disorders are sufficiently severe that nearly four out of five children require treatment (Gierut, 1998).

**What This May Mean:** Don’t expect most children with speech sound disorders to “get over it” without professional assistance.

3. At least three quarters of preschoolers with speech sound disorders also have language difficulties (Paul & Shriberg, 1982; Ruscello, St. Louis, & Mason, 1991; Shriberg & Kwiatkowski, 1988).

**What This May Mean:** Most preschoolers you see for speech sound disorders also need your help in language.

4. A toddler or a preschooler with a speech sound disorder is at increased risk for later academic difficulties during the school years (Anthony et al., 2011; Bird, Bishop, & Freeman, 1995; Felsenfeld, Broen, & McGue, 1994; Shriberg and Kwiatkowski, 1982; Shriberg et al., 2005; Van Dyke & Holte, 2003).

**What This May Mean:** Consider a speech sound disorder in a preschooler to be a red flag for possible future academic difficulties.

5. Preschoolers with speech sound disorders have a higher risk for school challenges if they also have language problems, lower nonverbal intelligence, and social disadvantages (Lewis et al., 2015).

**What This May Mean:** Your clinical alarm bells for future school challenges should go off loudly if a preschooler with a speech sound disorder also has either language problems, lower nonverbal intelligence, or comes from a deeply impoverished or neglectful environment.

6. Approximately 11% to 15% of 6-year-old students with speech sound disorders also experience specific language impairment (Shriberg & Tomblin, 1999).  
**What This May Mean:** Evaluate language along with speech, because a first grader referred to you for speech may also have language difficulties.
7. Half or more of students with speech sound disorders struggle academically all the way through high school (Felsenfeld et al., 1994; Gierut, 1998; Lewis, Freebairn, & Taylor, 2000; Pennington & Bishop, 2009; Shriberg & Austin, 1998).  
**What This May Mean:** Plan that your students with speech sound disorders will probably need academic assistance throughout school to reach their best potential.
8. Even when a student with reduced intelligibility does well in school, one third of grade school teachers perceive them as having less overall academic potential than their classmates (Overby, Carrell, & Bernthal, 2007).  
**What This May Mean:** The self-image of your student may be “bruised” by the fact that many people falsely believe that their speech difficulties reflect “lack of intelligence.”
9. A student with a speech sound disorder is at risk for being bullied, struggling with friendships, and enjoying school less (McCormack, Harrison, McLeod, & McAlister, 2011).  
**What This May Mean:** Keep your eyes open to the possibility that your student with a speech sound disorder is being ostracized, is socially isolated, or is being bullied.

## The Nature of Speech Sound Disorders

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Reflecting the nature of speech, speech sound disorders have a dual nature. Persons with **phonological disorders** have knowledge-based difficulties with language rules that underlie speech, while persons with **articulation disorders** have difficulty producing speech. To illustrate, a child with a phonological disorder might not know that **[st]** is a possible word initial consonant cluster (as in *stop*), whereas a child with an articulation disorder have difficulty shaping the articulators to pronounce **[st]**.

The conceptual distinction between knowing (phonology) and doing (speaking/articulation) is important because it suggests that seemingly similar difficulties may result from different causes. Possibly, a child with phonological problems may also show difficulties learning other aspects of language, including syntax and reading, while a child whose problem involves more “doing” than “knowing” may have difficulties restricted to pronunciation.

## Which Matters Most?

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Dodd and McIntosh (2010) assessed the relative contributions of phonology and articulation to speech production. The subjects were 62 two-year-old children who were developing typically. The researchers assessed children in articulation (oral motor skills,

speech perception abilities) and phonology (rule abstraction abilities). The researchers then measured the accuracy of their spoken words. The researchers discovered that phonological ability and articulation ability both contributed to speech accuracy, but that the greatest contribution came from a child's phonological abilities.

## A Long Discussion

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The Dodd & McIntosh study (2010) is part of a long 70-year discussion within the profession regarding the nature of speech disorders.

### Articulation Pioneers

The pioneers of our profession largely believed that speech problems arose because a person could not configure the mouth appropriately to produce speech sounds. This idea was reasonable at that time because the primary candidates for treatment were students with good cognition who had pronunciation problems affecting individual late acquired sounds containing notoriously difficult tongue configurations.

### The Rise of the Phonologists

Articulation approaches, which dominated the care of speech disorders for two-thirds of the 20th century, began to lose their appeal for many clinicians in the 1970s. The reason was that the primary tenets of articulation treatment (emphasis on individual sounds, phonetic drills, treatment of sounds in isolation and in nonsense syllables, improvements in small increments of change) proved far less successful with newer populations just appearing on the clinical horizon, many of whom were preschoolers with speech problems affecting sound classes. Phonological approaches gained popularity largely because focusing on speech as an aspect of language offered a means to treat newer, more involved populations.

### The Present Compromise

Here is a question you may have already asked yourself: what if you do not know if a speech problem arises from a problem with knowledge or doing? Or, what if you suspect that a speech problem arises from difficulties in both phonology *and* articulation? Or, what if you do not really care how a speech problem arises?

In all these situations, you may want a cover term that does not commit you to saying where a problem arises. The name of the cover term you are seeking is speech sound disorder. Though the term seems somewhat dull, it has gained currency in the profession because it is neutral to the disorder's cause (Bowen, 2009; Williams, 2010). In the future, speech sound disorder may develop its own theoretical baggage, but for the present time it seems useful. Some authors, noting that children with speech sound disorders often speak similarly to younger children without speech problems, prefer to use the term delay rather than disorder (Curtiss, Katz, & Tallal, 1992).

**CLINIC BOX: Other Terms, Similar Meanings**

Disorders of articulation and phonology go by an impressive number of different names, including

- articulation disorder (for both articulation and phonological disorders);
- phonological disorder (for both articulation and phonological disorders);
- developmental \_\_\_ (speech, articulation, or phonology) disorder;
- functional speech disorder;
- phonomotor disorder;
- speech disorder;
- functional articulation disorder; and
- idiopathic speech disorder.

Studies: Bauman-Waengler, 2000; Bernhardt & Stemberger, 1998; Bernthal, Bankson, & Flipsen, 2009; Craghead, Newman, & Secord, 1989; Fey, 1992; Hodson, 1994; Hoffman, Schuckers, & Daniloff, 1989; Locke, 1983; Lowe, 1994; Rvachew & Brosseau-Lapre, 2017; Shelton & McReynolds, 1979; Shriberg & Kwiatkowski, 1982; Smit, 2003; Weiss, Gordon, & Lillywhite, 1987; Williams, 2003; Winitz, 1984.

**The Future?**

Though articulation and phonology are the dominant perspectives in our profession, they are not necessary ways to consider speech sound disorders. In fact, established ideas have a bad tendency to become blinders, blocking newer perspectives from taking hold. For example, as we learn more about the workings of the brain, perhaps speech treatment will add neurological viewpoints. Or, as we learn more about cognition, perhaps clinicians will say, in effect, “Why describe speech sound disorders in terms of articulation and phonology? Scrap them both. What matters is memory, representation, speech planning, execution, and feedback” (Anthony et al., 2011). Alternately, perhaps a more social perspective will arise and clinicians will say, “No, no: while articulation, phonology, neurology, and cognition matter, what matters most in speech learning is social relations.”

My own vote for the future is all the above. One perspective does not preclude insights from other viewpoints. For example, social psychology may offer insights about the social nature of learning, while neurology may help explain how the brain makes speech possible. I suspect the best ideas probably are those we haven’t thought of yet. Perhaps the only certain thing about the future study of speech and its disorders is that humans will remain too complex and diverse to fit entirely into the box of any single theoretical framework.

**Will This Help Someone?**

Most students who study speech sound disorders want to know if learning this will help someone.

**CLINIC BOX: Would a Pill Help?**

It's tempting to think of a speech sound disorder as an illness and speech treatment as a pill. To illustrate, within the pill perspective you might diagnose a child with an articulation problem and then give an articulation approach pill to correct the condition. The trouble is the analogy becomes stretched very fast. Illnesses tend to be recognized as such regardless of where they occur, while a speech characteristic may be considered a disorder in one community and a normal speech variation in another. As for speech treatment being a pill, a child with an articulation problem may not respond to an articulation approach, but may improve through language activities, or because they want to impress the clinician (or maybe a girl/boy), or they may feel ready to work on speech issues. Perhaps the lesson is that the avenue you follow to helping a child often entails far greater creativity and insight than administering an articulation or phonology pill.

## The Short Answer

---

The short answer: yes. Literally hundreds of studies document the positive effects of speech treatment (Baker & McLeod, 2011). Knowledge of speech sound disorders can help you

- promote vocal development in an infant with medical needs;
- assist a toddler with a developmental disability learn to speak;
- lead a preschooler to unravel the mysteries of speaking in sentences;
- support a student to succeed socially and academically; and
- help persons without communication disorders to learn English as a second language.

## A Slightly Less Short Answer

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A slightly less short answer: everyone recognizes the need for additional and more rigorous research to support clinical decisions. **Evidence-based practice (EBP)** (the use of research evidence to guide clinical practice) is a major goal of the clinicians in our profession (Apel & Self, 2003).

You may wonder why this area needs more research support. One reason is the subject matter: speaking is astonishingly complex and the people who have speech disorders are far more complex than their speech, and both variables—speech and person—combine in successful treatment. With such complexity, the more we learn about speech and about speech learners, the more our treatments change and the more we need new research to support our work.

Another reason is that the study of speech sound disorders changes in response to evolution of culture, health care, and education. Just a few of the many possible illustrations: