

Chapter One

Overview

Ken Bleile

Introduction

The English sounds most likely to challenge a school-aged student are [θ], [ð], [s], [z], [l], vocalic and consonantal [r], [ʃ], [tʃ], and [dʒ]. Approximately 6% of all school-aged students experience difficulty learning these late acquired sounds; 92% of school-based clinicians have students with such speech problems on their caseloads (Shewan, 1988). Because late acquired English sounds are more likely than early acquired sounds to be missing from the speech inventories of other languages, they often present special difficulties to non-native speakers. In large urban areas such as New York City one in four adults report having difficulty speaking English (Bernstein, 2005). Across the United States approximately 18% of children speak a language other than English at home.

Every student and clinician who works with school-aged students or non-native English speakers should know how to treat late acquired sounds competently and efficiently. In the first decades of our profession, numerous books, articles and chapters, and seminars were devoted to treating these problems. In more recent decades the flow of information and ideas has diminished to a bare trickle, reflecting a change in professional attention, which has shifted to meet clinical demands presented by seemingly ever younger and more disabled children. Needs of an otherwise typically developing student who experiences difficulty saying a few late acquired sounds is not often considered a high priority. Further, a sense may exist that ideas and materials to meet the needs of such a student were addressed long ago by Van Riper, McDonald, and other clinical pioneers. Lastly, some have said (sometimes quietly, sometimes a little more loudly) that dealing with school-aged “artic” problems is, well, boring.

School-aged students with “artic errors” as well as children and adults acquiring English as a non-native language have needs that should not be marginalized. The numbers of such students is enormous and growing more so with the influx of new immigrants. Further, though students with medical and extensive developmental needs demand clinical attention, one population of students should not be excluded for the sake of demands placed by another. Clinical attention must include the entire range of students that are served, and a person should not be excluded from receiving service because of excellent potential for improvement. Professional interest in children with more involved developmental needs does not preclude a similar interest in those on the other end of the severity continuum. Indeed, many clinicians find a balanced caseload is best, some with long-term developmental needs and others with more easily resolved problems.

Nor is it the case everything the profession needs to know to treat these students was written long ago. While the insights of Van Riper remain important and relevant, much has been learned in the intervening years, especially regarding language acquisition, second-language learning, inclusive practices, and motor learning. Ideas from those areas can and must shape and inform how a clinician thinks about treating late acquired speech sounds. When these new ideas infuse clinical care, what is done no longer is traditional articulation therapy.

Lastly, treatment for late acquired sounds should not be boring either for a clinician or for a student. It is not always fun, fun, fun— but what type of valuable therapy IS always fun, fun, fun? It is technically demanding work, requiring a solid understanding of phonetics, as well as a good understanding of language, cognitive and social aspects of learning, and the educational system. And as in all clinical domains, a clinician must wrestle with such human variables as the student’s motivation, focus, and

personality. Challenging and rewarding? Yes. Boring? Only as boring or as exciting as the ideas and enthusiasm brought to it.

Organization of Book

This book is a resource for clinicians, students, and academics who work with students whose speech contains errors affecting late acquired sounds. Arranged from the front to the back of the mouth, the sounds are [θ], [ð], [s], [z], [l], consonantal and vocalic [r], [ʃ], [tʃ], and [dʒ]. Though the book is based on American English, the hope is that commonalities between American English and other English varieties are sufficient for the material to prove useful elsewhere in the world. The hope also is that professionals working in other languages will find useful ideas for treating late acquired sounds in their languages.

The book does not replace coursework or an academic book. Rather, the assumption is that a reader has had appropriate academic and clinical preparation, and that the book is a useful compendium, a type of “one-stop shopping place” for treating errors affecting late acquired sounds.

“One stop shopping” includes the following resources for each sound:

- Definition
- Acquisition
- Errors
- Key Environments
- Metaphors
- Touch cues
- Screening for stimulability
- Demonstrations
- Phonetic placement and shaping techniques
- Word lists
- Minimal pairs
- Awareness exercises
- Speech exercises

Additionally, all the resources and their typical uses in treatment are described in the present chapter. An illustration showing how the resources are used in the author’s clinical setting is shown in Chapter Twelve. Language activities for all the sounds are presented in Appendix A, and a compilation of tips to students is offered in Appendix B.

Late Acquired Sounds

The following resources are offered for each of the ten chapters focusing on a late acquired sound.

Definition

The definition provides a prose description how a sound is produced, or, as in the case of sounds such as [s], [z], and [r], the several different ways it may be produced. A brief technical definition of the sound also is provided. To illustrate, the technical definition of [s] is alveolar voiceless fricative.

Understanding how a sound is produced is essential background information before beginning therapy. When sounds can be pronounced in more way a clinician must decide which variant to teach. Typically, a clinician follows the student’s lead—that is, if a student already makes [s] with the tongue tip lowered, the clinician teaches [s] with a lowered tongue. If a student does not have a preferred way, a clinician may feel freer to select an appropriate variant.

Acquisition

Acquisition data show the ages at which 50% and 75% of children acquire a sound. This resource is used make at least two clinical decisions:

1. Deciding if therapy should be undertaken, and
2. Selecting among different possible treatment sounds.

For the first decision, depending on clinical philosophy and workload demands, some clinicians may provide treatment for a sound after the age at which the majority of peers (50% criterion) have mastered it, while others may wait until a later time (75% criterion). Importantly, acquisition norms are only one of several possible variables that come into play in this decision. Other variables may include stimulability (whether a student being considered for therapy already shows some capacity to pronounce a sound), grade level, presence of co-occurring developmental disabilities or medical conditions, and wishes of the student, the family and teacher.

For the second decision, normative information helps a clinician decide between possible treatment sounds. To illustrate, a student's speech may contain several speech errors, one affecting a sound acquired by 50% of children at 5 years, and others acquired by 50% of children by 6 years. All other things being equal, a clinician might opt to treat an earlier acquired sound first based on the rationale that the student is farther behind on that sound compared to age peers than he or she is for other sounds. However, seldom are all other things equal, and a clinician often weighs additional factors listed in the preceding paragraph – especially stimulability and student wishes—along with normative data when deciding between possible treatment sounds.

Errors

This resource shows the types of errors, both common and uncommon, a student is likely to make when he or she cannot pronounce a sound. To illustrate, errors affecting [s] include [t] for [s] and [f] for [s] among others. The first error is relatively common across children and is called Stopping—that is, [s], a fricative, is converted into a stop consonant ([t]) made in the same place in the mouth as [s] (alveolar ridge). . A less common error is [s] pronounced as [f], which retains the fricative nature of [s] ([f] also is a fricative), while changing the place of production from alveolar to labiodental. Because students are as diverse in their speech errors as in other respects, not all possible errors can be listed. Instead, this resource indicates types of errors a student may make affecting [s], and indicate whether the error is relatively common or uncommon.

Clinically, speech errors are important for several reasons. First, certain types of speech errors may be stigmatized socially. To illustrate, whether or not one agrees with society's value judgment, a student who pronounces [w] for [r] may be perceived as childish, a male student who pronounces [s] between the front teeth may be called effeminate, or an adult second-language learner may be received as having “too much accent.” Second, speech errors may affect intelligibility. In general, errors affecting more frequently occurring sounds impact intelligibility greater than errors affecting less frequent sounds. Speech errors may influence intelligibility in other ways. Deletion errors impacts intelligibility because deletion removes the acoustic information needed to determine the sound. Similarly, because listeners tend to pay more attention to the beginning of words than their ends, a speech error in word initial position may affect intelligibility more than one at the end of words. Lastly, unusual errors, especially if a listener is not familiar with a student's speech, may strongly affect intelligibility.

Key Environments

While the resource for speech errors describes what a student does incorrectly, the resource for key environments describes the phonetic environments in which a student is likely to pronounce a sound correctly. To illustrate, key environments for [s] are the beginning of words before [i], after [t], and the end of words. Key environments are more “best bets” than absolute laws. Stated differently, a best bet is that a student will learn to pronounce [s] more quickly in the environments listed above, rather than, for example, before [u] or in a consonant cluster containing [r]. Importantly, key environments for sounds overlap, with similarly pronounced sounds sharing similar key environments and less similarly pronounced sounds possessing fewer common key environments.

Key environments are enormously useful in the early stages of treatment when a clinician tries to establish a treatment sound in a student's speech. Typically, a clinician finds a short, simple word that contains the treatment sound in a key environment (for example, *see* for [s]). Once a treatment sound is established in that environment, treatment proceeds to pronouncing it in a greater range of environments and in different words.

Metaphors

This resource provides a way to refer to a treatment sound. For a student who is a teenager or an adult, nothing is wrong with calling a treatment sound by its technical name. To illustrate, with some adult students a clinician may decide to call [s] “a fricative sound” or “a fricative made at the alveolar ridge.” However, a younger student typically finds such technical vocabulary either meaningless or confusing. For such students, a metaphor is useful. For example, [s] might be called “the snake sound” or “the hissing tire sound.”

An effective metaphor draws a student’s attention to the aspect of speech that is the focus of therapy. For example, “the snake sound,” which draws attention to the continuous nature of the air stream during production of [s], is used with a student who pronounces [s] as a stop consonant, while “a tongue tip sound” is used with a student who pronounces [s] as a lateral consonant with air flowing over the sides of the tongue. It also is possible to have several metaphors for the same sound, though the clinician needs to be careful not to cause confusion. For example, a clinician might refer to [s] as “the snake sound” when working on improving continuous air flow, and remind the student that [s] also is a “a tongue tip sound” when working on tongue placement.

Often, a metaphor proves more successful when a student is involved in its selection. Typically, a clinician presents several options for metaphors and asks the student to select one. Allowing a student to help select a metaphor entails the clinician giving up a measure of control—after all, a student is not obliged to select the metaphor that the clinician thinks best captures the nature of the student’s speech problem. A clinician must weigh selection of the most appropriate metaphor against a student’s need for involvement. In the author’s experience, most often the issue does not arise and selection of a metaphor presents few problems. If a question of Appropriateness v. Student Involvement arose, most clinicians give up the best, most appropriate metaphor in favor of student involvement.

Touch Cues

Touch cues draw attention to an aspect of a sound’s production, typically the place of production. For example, a touch cue for [b] and [p] may involve laying a finger in front of the lips. Touch cues provide useful ways to refer to treatment sounds through modalities (touch and sight) other than hearing. Touch cues are powerful reminders for some students, though others may find them of minimal use or even annoying.

Screening for Stimulability

This resource helps determine if a student has any capacity to pronounce a possible treatment sound. A student who can pronounce a sound is said to be stimuable for that sound. If a student is stimuable for a sound, the clinical task then becomes to expand this ability until it is his or her everyday way of talking. If a student is not stimuable for a sound, a clinician must first introduce it in a student’s speech repertoire (that is, make the student stimuable for the sound) before moving on to the expansion phase of treatment.

An important, much debated question is will a student self-correct stimuable sounds without treatment? Research suggests extensive individual variation, with some students self-correcting and others not. As with many aspects of clinical decision making, reasonable people may disagree on this issue, some selecting to work with only stimuable sounds and others selecting only to treat non-stimuable ones. Many other clinicians fall in the middle: working first on a stimuable sound to build a student’s confidence with success before tackling more difficult non-stimuable sounds. Perhaps what is less controversial is that stimuable sounds are generally easier to teach because a student already has some capacity to pronounce it. Another less controversial issue concerns the effects of age on speech development. As is well known, speech development slows down considerably near puberty. Most clinicians would likely treat a non-stimuable sound if a student was approaching puberty, was past puberty, or was an adult.

Stimulability is assessed in four ways:

- Imitation,
- Key environments,
- Key Words, and

- Phonetic placement and shaping.

Imitation: A student is stimutable in imitation if ability to produce a sound is limited to occurring immediately after a clinician's model. For example, such a student can pronounce [r] in *row* within a few seconds of the clinician saying the same word, but not when shown a picture of someone rowing. For such a student a major early goal of treatment is to progress from saying a sound in imitation to saying it spontaneously.

Key environment: A student is stimutable in a key environment if ability to pronounce a sound is limited to a particular phonetic environment or small set of phonetic environments. To illustrate, a student stimutable in a key environment can pronounce [r] at the beginning of words, but not at the end of words. An important early goal of treatment for such a student is to progress to saying a treatment sound in a variety of phonetic environments.

Key words: A student is stimutable in a key word if ability to pronounce a sound is limited to only one or a small set of words. To illustrate, a student stimutable in a key word may pronounce [l] in *Lou*, the name of a big brother, but not in other words. A major early goal of treatment for such a student is to learn to pronounce a treatment sound regardless of the word in which it occurs.

Phonetic placement and shaping: A student is stimutable through phonetic placement and shaping if ability to pronounce a treatment sound only occurs in response to those techniques (see later section in this chapter for discussion of phonetic placement and shaping techniques. To illustrate, a student who is stimutable only through phonetic placement and shaping techniques may pronounce [s] only when a clinician shapes [t] into [s]. A major early goal of treatment for such a student is to progress to pronouncing a treatment goal without the need of such techniques.

A sound can also be stimutable a fifth way—simply by occurring with low frequency across a number of different words and in a variety of phonetic environments. Whether this type of stimulability exists is determined through a spontaneous speech sample or through asking someone who knows the student well, perhaps a teacher or family member. A sound is stimutable if it occurs in one or more of the five conditions.

Demonstrations

Demonstrations help a student learn a little how a treatment sound is produced. A demonstration can be simple or involved, may require no implements or make use of a mirror and other tools. In general, simple demonstrations work best, relying on a few clinical tools. If a clinician is going to put a hand in the student's mouth, all universal health care precautions should be followed.

The following is a simple demonstration of [s].

Objects: Q-tip, peanut butter or other favored food.

Instructions:

1. Instruct the student, "Please open your mouth."
2. One the mouth is open, with Q-tip dab a little peanut butter or other favorite food on alveolar ridge (for tongue tip raised [s]) or behind lower front teeth (for tongue tip lowered [s]).
3. Ask the student to touch the food with the tongue tip.

No single demonstration is effective for all students. For this reason, a variety of options are offered. Each demonstration is an abbreviation that a clinician should expand and adapt to fit a particular student's need. To illustrate, for some students a clinician may first demonstrate the technique on him or her self before asking the student to do it. Use of a mirror in which a student can observe him or her self is helpful for many students. A sucker instead of a q-tip and rewards for compliance may be useful with younger students, while older students and adults may benefit from a longer, more detailed description of how a sound is pronounced.

Phonetic Placement and Shaping Techniques

The phonetic placement and shaping resource helps a student learn to pronounce a treatment sound. Techniques presented in this book were culled from many sources, published and unpublished. The main published sources were books long out of print; most especially, Nemoj and Davis. Unpublished sources include many talented and creative clinicians that the author has had the pleasure to interact with over the years.

Phonetic placement techniques are similar to demonstrations, the difference being that phonetic placement techniques require a production from a student and demonstrations do not. As with demonstrations, in this book phonetic placement techniques are presented in abbreviated forms that are expanded to fit the needs of a specific student.

The following is a phonetic placement technique for [θ].

The description is the equivalent of a bare bones recipe that can be expanded and modified in many different ways. Typically, the actual phonetic placement or shaping technique used with a student contains the following elements:

1. An initial self-demonstration by the clinician.
2. Having the student practice the steps in the technique. Use of a touch cue and metaphors focus the student and help remind him or her about how the sound is pronounced.
3. The student attempts to make the sound.
4. The clinician gives feedback about the success of the attempt.

The following illustrates one way to expand the technique presented above.:

Objects: feather or small piece of paper

Instructions:

1. First demonstrate the method on yourself.
2. To begin, place your tongue between your upper and lower front teeth.
3. Place a feather or small piece of paper in front of your mouth, about a half inch to inch from your tongue.
4. Blow air over your tongue to move the feather or paper.
5. Explain, “That’s how you make the leaking tire sound. Now it’s your turn.”
6. Instruct the student to stick out his or her tongue just as you did.
7. When the tongue is out, place the feather or paper before the mouth.
8. Explain, “Now blow to make it move.”
9. If the sound is made correctly, say, “That’s right. You did it. You made [θ]—the leaky tire sound.” If the sound is made incorrectly, say something like, “Good try. Let’s try again.”

Shaping techniques differ from phonetic placement techniques only in that a shaping technique converts a sound a student can make into one he or she cannot. The following illustrates how a schwa [ɪ] is converted (shaped) into a consonantal [r],

Objects: None

Instructions:

1. Ask the student to say vocalic [ɪ].
2. Next, ask the student to say vocalic [ɪ] followed by [i] or some other vowel.
3. Instruct the student to say [i] several times as quickly as possible, resulting in vocalic [ɪ] + [ri]. After [ri] is established, instruct the student to say vocalic [ɪ] silently, resulting in [ri].

Phonetic placement and shaping techniques require fairly advanced attention and cognitive skills, and typically work best with an older child (7 years or older), teenager, or adult who otherwise is unstimulable for a treatment sound. Through use of phonetic placement and shaping techniques, a student becomes stimulable for a sound—that is, learns to pronounce it in a limited context. Once stimulable, treatment then proceeds to expanding the use of the sound.

Word Lists

This is the most adaptable resource in the book. A list of easily pictured words is presented for each sound, divided according to word position. To illustrate, the [s] list contains the sound at the beginning of words, at the end of words, between vowels, and in consonant clusters. Uses of the lists is limited only by imagination—they may be made into drills, into phonological awareness activities, to practice sounds, to help a student identify sounds, etc.

Minimal Pairs

This resource helps develop minimal pair activities. A minimal pair is two words that rhyme. To illustrate, *sand* and *hand* are a minimal pair. Minimal pairs compel a student to distinguish between meanings based on pronunciation, and are widely used clinically in both perceptual and production activities.

Awareness Exercises

This resource provides practice identifying a treatment sound at the word level. Through short exercise a student learns to find a word containing a treatment sound from among a small group of other words. No type of speech production is required by the student.

Three types of speech awareness exercises are provided for each sound. The examples are for [s] at the beginning of words.

1. Identifying words with the treatment sound when all the words have the same number of syllables.

This is the simplest type of awareness exercises, requiring only that a student monitor the list to detect a word that contains a treatment sound.

Words

Sea ____
Dog ____
Jump ____
Sad ____

2. Identifying words with the treatment sound when two words rhyme.

This simple exercise asks a student to find a word containing a treatment sound in a minimal pair.

Words	First	Second
Sat	Sat ____	Rat
Sail	Sail ____	Whale

3. Identifying words with the treatment sound when all the words rhyme.

This exercise also asks a student to find a treatment sound in a word from among words that rhyme. Differing from the previous exercise, the rhyming words all rhyme with a single word that contains a treatment sound.

Words

Sip ____
Ship ____
Sip ____
Lip ____

Speech Exercises

This resource is used to provide practice producing a treatment sound at the word level, and to learn to self-monitor and self-correct. Ability to make the sound in words and to self-monitor and self-correct are critical to generalizing what is learned during treatment everyday life.

Six types of pronunciation exercises are available for each sound. As for the speech awareness exercises, examples are for [s] at the beginning of words.

1. *Pronouncing treatment sound in imitated words.*

Word	Teacher	Student
Sat	Sat	Sat ___
Sail	Sail	Sail ___

2. *Making self corrections of the treatment sound in multiple productions of the same word.*

Word	Student	Student	Student
Sat	Sat ___	Sat ___	Sat ___
Sail	Sail ___	Sail ___	Sail ___

3. *Inserting the deleted sound in words.*

Word	Teacher	Student
Sat	at	Sat ___
Sail	ail	Sail ___

4. *Pronouncing the treatment sound in rhymed words.*

Word	Teacher	Student
Sat	Cat	Sat ___
Sail	Whale	Sail ___

5. *Contrasting old and new ways of making the treatment sound.*

Word	Old Way	New Way
Sat	Sat	Sat ___
Sail	Sail	Sail ___

6. *Contrasting a similar sound with the treatment sound.*

Word	Student	Student	Student
Sun	Sun ___	un	Sun ___

Typically, a student responds best to several forms of practice. The others may then either be set aside or, more often, re-introduced later.

Final Chapter and Appendices

The book concludes with a chapter illustrating how ideas and materials shown in this book are employed in one clinical setting. Appendix A provides an extensive list of language activities to bridge the gap between practicing a treatment and using it in everyday speech, and Appendix B provides a compilation of tips to students based on the author's teaching experiences.

References

Bernstein, N. (2005). Proficiency in English decreases over a decade. *New York Times*, January 19.

Shewan, C. (1988). 1988 omnibus survey: Adaptation and progress in times of change. *Asha* 30, 27-30.