Preface

I began the manuscript for the first edition of *Fundamentals of Phonetics: A Practical Guide for Students* in 1996 when I could not find the "perfect" phonetics textbook that aligned with my lectures. I was hard-pressed to find a phonetics textbook that provided an abundance of practice exercises for students to become proficient in the skill of phonetic transcription of American English. Therefore, I was determined to create such a textbook. I would never have believed that almost 20 years later I would be writing a preface to the fourth edition of this book. I hope that this new edition continues to provide students with the tools they need to become skilled experts in phonetic transcription.

The fourth edition is similar in its basic format to the previous three editions. Each chapter has been revised with updated material and new exercises. A couple of the chapters have been reorganized in terms of content.

Recordings of many of the exercises in the text are available on supplemental audio CDs from Pearson. These recordings are essential in helping students learn the subtleties of pronunciation, both in relation to the segmental and suprasegmental characteristics of speech. A list of the recordings appears in the Appendix of this text.

New to This Edition

- Additional information relating to the use of computer fonts in phonetic transcription has been added to Chapter 1, *Phonetics: A "Sound" Science*.
- More exercises have been added to Chapter 3, *Anatomy and Physiology of the Speech Mechanism*. Information relating to resonance of the vocal tract has been restored to this chapter from previous editions.
- The information relating to the acoustics of speech sounds has been removed from Chapter 4, *Vowels,* and Chapter 5, *Consonants,* from the third edition, and has been incorporated into the new Chapter 6, *Acoustic Characteristics of Vowels and Consonants*. This new chapter provides expanded information relating to the acoustic characteristics of speech sounds; several new figures have been added as well.

- Chapter 9, *Dialectal Variation,* has been greatly revised. Updated information reflects current census data as it relates to the population demographics of the United States. The section on *regional dialects* has been expanded, and the section on East Asian languages has been reworked.
- A new section on Asian Indian English has been added to Chapter 9.
- Learning Objectives have been updated in each chapter to reflect new changes in content.
- Online Resources have been updated to include additional websites that should prove beneficial to students' understanding of phonetics.
- All references have been updated to reflect current philosophies and best practices in the speech, language, and hearing professions.
- The supplemental audio CDs contain new recordings to accompany some of the exercises in Chapter 7, *Connected Speech*, and Chapter 9, *Dialectal Variation.* The recordings for Chapter 7 emphasize the suprasegmental aspects of speech utilizing both adults and children as speakers. Chapter 9 incorporates new recordings of a female speaker from New Delhi to complement the new section on Asian Indian English.

Acknowledgments

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Also, I would like to thank Rob Fox and Ewa Jacewicz at Ohio State University for their continued assistance in the creation of recordings for the supplemental audio CDs. A big thank you goes to Mark Bunce at Bowling Green State University for his work in creating the actual CD masters.

I must thank Nandhu Radhakrishnan of Lamar University and Vijayachandra Ramachandra of Marywood University (both previous doctoral students at Bowling Green State University), who provided invaluable information relating to the new section on Asian Indian English in Chapter 9, *Dialectal Variation.* Additionally, I would like to thank Sethu Karthikeyan of Pace University for her comments and suggestions for this chapter.

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CHAPTER

1 Phonetics: A "Sound" Science

Learning Objectives

After reading this chapter you will be able to:

1. Explain the importance of the study of phonetics.
2. Explain the importance of the *International Phonetic Alphabet (IPA)* in phonetic transcription.
3. State reasons for variation in phonetic transcription practice.
4. State the benefits of using a Unicode font for phonetic transcription.

As adults, you are all familiar with the speaking process. Speaking is something you do every day. In fact, most people find speech to be quite automatic. It is safe to say that most of us are experts at speaking. We probably have been experts since the time we were 3 or 4 years old. Yet we never really think about the process of speech. We do not, as a rule, sit around thinking about how ideas are formed and how their encoded forms are sent from the brain to the speech organs, such as the teeth, lips, and tongue. Nor do we think about how the speech organs can move in synchrony to form words. Think about the last party you attended. You probably did not debate the intricacies of the speech process while conversing with friends. Speaking is something we learned during infancy, and we take the entire process for granted. We are not aware of the speech process; it is involuntary—so involuntary that we often are not conscious of what we have said until after we have said it. Those of you who have "stuck your foot in your mouth" know exactly how automatic the speech process is. Often we have said things and we have no idea why we said them.

Phonetics is the study of the production and perception of speech sounds. During your study of phonetics, you will begin to think about the process of speech production. You will learn how speech is formulated by the speech organs. You also will learn how individual speech sounds are created and how they are combined during the speech process to form syllables and words. You will need to learn to *listen* to the speech patterns of words and sentences to become familiar with the sounds of speech that comprise spoken language. A large part of any course in phonetics also involves how speech sounds are transcribed, or written. Therefore, you also will be learning a new alphabet that will enable you to transcribe speech sounds. This alphabet, the **International Phonetic Alphabet (IPA)**, is different from most alphabets because it is designed to represent the *sounds* of words, not their spellings. Without such a

systematic phonetic alphabet, it would be virtually impossible to capture on paper an accurate representation of the speech sound disorders of individuals seeking professional remediation. Using the IPA also permits consistency among professionals in their transcription of typical or atypical speech.

Another "sound" science related to phonetics is **phonology**. Phonology is the systematic organization of speech sounds in the production of language. The major distinction between the fields of phonetics and phonology is that *phonetics* focuses on the study of speech sounds, their acoustic and perceptual characteristics, and how they are produced by the speech organs. *Phonology* focuses on the linguistic (phonological) rules that are used to specify the manner in which speech sounds are organized and combined into meaningful units, which are then combined to form syllables, words, and sentences. Phonological rules, along with syntactic/morphological rules (for grammar), semantic rules (for utterance meaning), and pragmatic rules (for language use), are the major rule systems used in production of language.

The idea of studying speech sounds may be an odd idea to understand at first. We generally think about words in terms of how they appear in print or how they are spelled. We usually do not take the time to stop and think about how words are spoken and how spoken words sound to a listener. Look at the word "phone" for a moment. What comes to mind? You might consider the fact that it contains the five letters: p-h-o-n-e. Or you might think of its definition. You probably did not say to yourself that there are only three speech sounds in the word ("f"-"o"-"n"). The reason you do not consider the sound patterns of words when reading is simple—it is not something you do daily. Nor is it something you were taught to do. In fact, talking about the sound patterns of words and being able to transcribe them is an arduous task; it requires considerable practice.

As you soon will find out, the way you believe a word sounds may not be the way it sounds at all. First, it is difficult to forget our notions of how a word is spelled. Second, our conception of how a word sounds is usually wrong. Consider the greeting "How are you doing?" We rarely ask this question with such formality. Most likely, we would say "How ya doin'?" What happens to the word "are" in this informal version? It disappears! Now examine the pronunciation of the words "do" and "you" in "Whatcha want?" (the informal version of "What do you want?"). Neither of these words is spoken in any recognizable form. Actually, these words become the non-English word "cha" in "whatcha." With these examples, you can begin to understand the importance of thinking about the sounds of speech in order to be able to discuss and transcribe speech patterns.

EXERCISE 1.1

The expressions below are written two separate ways: (1) formally and (2) casually. Examine the differences between the two versions. What happens to the production of the *individual* words in the casual version?

Formal	**Casual**
1. Are you going to eat now?	Ya gonna eat now?
2. Can't you see her?	Cantcha see 'er?
3. Did you go?	Ja go?

Phonetics is a skill-based course much like taking a foreign language or sign language course. In many ways, it *is* like learning a new language because as you learn the IPA, you will be learning new symbols and new rules to represent spoken language. However, the new symbols you will be learning will be representative of the *sounds* of English, *not their spelling*. As with the learning of any new language, phonetics requires considerable practice in order for you to become proficient in its use when transcribing speech patterns. This textbook is designed to promote practice of phonetic transcription principles.

At the beginning of each chapter, several *Learning Objectives* will be listed. By reading through the Learning Objectives, you will have a clear idea of the material contained in each chapter and what you should expect to learn as you read through the text and complete the exercises.

By now, you have noticed that exercises are embedded in the text. It is important that you complete the exercises as you go along instead of waiting until after you have completed the chapter. These exercises emphasize particular points, highlighting the material you just completed, assisting in the learning process. If you are unsure of an answer, simply look in the back of the book for assistance in completing the embedded exercises.

At the end of each chapter, you will find a series of *Review Exercises* so that you may gain expertise with the material presented. The Review Exercises help drive home much of the material discussed in each chapter. All of the answers to the Review Exercises are located at the back of the book. Similar to the embedded exercises, providing the correct answers for the Review Exercises will provide you with immediate feedback, helping you learn from your mistakes. There is no better way to learn! To aid in the learning process, all new terms will be in bold letters the first time they are used. In addition, all new terms can be found in the *Glossary* at the back of the book.

Study Questions at the end of each chapter will help you explore the major concepts presented. *Online Resources* also are provided to supplement the material presented in the text. *Assignments* at the end of the chapters were designed to be collected by your instructor to test your comprehension of the material. Therefore, the answers for Assignments are not given in the text.

There are several conventions that will be adopted throughout the text. When there is a reference to a particular Roman alphabet letter, it will be enclosed with a set of quotation marks: for example, the letter “m.” Likewise, references to a particular word will also be enclosed with quotation marks: for example, “mail.” Individual speech sounds will be referenced with the traditional slash marks: for example, the /m/ sound. When a word and its transcription are given together, they will appear in the following format: “mail” /meɪl/.

A set of three optional audio CDs provide listening exercises to accompany the text. Clinical practice generally requires phonetic transcription of recorded speech samples. Reading words on paper and transcribing them is not the same as transcribing spoken words. The audio CDs are designed to increase your listening skills and your ability to transcribe spoken English. Exercises requiring the audio CDs will be indicated with a CD icon in the margin of the text. There also will be a notation indicating the CD track number where the recorded exercise may be found. A complete listing of the audio tracks is given in the Appendix.

Variation in Phonetic Practice

Although the IPA was developed for consistency, not everyone transcribes speech in the same manner. The IPA does allow for some flexibility in actual practice. If you were to pick up another phonetics textbook, you would find some definite differences in transcription symbols. Therefore, alternate transcription schemes will be introduced throughout this text.

One reason transcription practice differs from individual to individual is due to personal habit or the method learned. For instance, the word "or" (or "oar") could be transcribed reliably in all of the following ways:

/ɔr/, /or/, /ɔ͡ɚ/, /o͡ɚ/, /ɔ͡ɚ/

All of these forms have appeared in other phonetics textbooks and have been adopted by professionals through the years.

Several years ago, I was assigned to a jury trial that lasted two weeks. Due to the length of the trial, the judge allowed us to take notes. So that no one could read my notes, I decided to use the IPA! Because I had to write quickly, my transcription habits changed. At the beginning of the trial, I transcribed the word "or" as /ɔ͡ɚ/ due to personal preference. By the middle of the trial, I had switched to /ɔr/, simply because it was easier to write and was more time efficient.

Another difference in ease of use of transcription symbols involves the symbol /r/, traditionally used to transcribe the initial sound in the word "red." According to the IPA, this sound actually should be transcribed with the symbol /ɹ/. The IPA symbol /r/ represents a *trill*, a sound found in Spanish and other languages, but not part of the English speech sound system. Because /r/ and /ɹ/ both do not exist in English, /r/ routinely has been substituted simply because it is easier to write. Since most speech and hearing professionals have continued to use the symbol /r/ instead of /ɹ/ in written transcription, the tradition will be continued in this textbook.

As future speech and hearing professionals, you will be using the IPA to transcribe clients with speech sound disorders. Because the IPA was not originally designed for this purpose, clinicians have varied in their choice of symbols in transcription of speech sound disorders. In 1990, an extended set of phonetic symbols (known as the extIPA) was created as a supplement to the IPA to provide a more standard method for transcription of speech sound disorders (see Chapter 8). Similar to the original IPA, the extIPA has not been used consistently among phoneticians, linguists, and speech and hearing professionals.

Is one method of transcription "better" or more correct than another? Some linguists and phoneticians might argue that one form is superior to another based on linguistic, phonological, or acoustic theory. The form of transcription you adopt is not important as long as you understand the underlying rationale for your choice of symbols. In addition, you need to make sure that you are consistent and accurate in the use of the symbols you adopt. Throughout this book, variant transcriptions will be introduced to increase your familiarity with the different symbols you may encounter in actual clinical practice in the future.

The IPA and Unicode Fonts

Historically, the typical typewriter or computer did not lend itself well to the IPA. Some keyboard symbols were routinely substituted for IPA symbols simply because typewriters and computer keyboards did not have keys for many of

the IPA symbols. For example, the word "dot" was typically transcribed (i.e., typed) as /dat/ instead of the correct form /dɑt/ because it simply was not possible to type the vowel symbol /ɑ/.

You may not know it, but you already may have the ability to type IPA symbols with one of the fonts located on your computer. In Microsoft Windows 7 or 8, these include Times New Roman, Arial, Tahoma, and Lucida Sans Unicode. Mac OS X users can select from Helvetica, Lucida Grande, and Monaco. In 1991, the Unicode Consortium was established to develop a universal character set that would represent all of the world's languages. The Consortium continues to publish the Unicode Standard, which in its most recent version, version 7.0.0, covers virtually all of the characters of all the languages of the world, including several character sets for the IPA. In addition, there are character sets for currency symbols, braille patterns, geometric shapes, musical symbols, mathematical symbols, and even emoticons.

The current version of the Standard allows for over 110,000 characters, each mapped to a unique alphanumeric sequence called a *code point*. A code point is a hexadecimal sequence of numbers (0 through 9) and/or letters ("a" through "f") that uniquely identify each of the characters in the set. Each character also has a unique name. For instance, the code point for the Roman letter "j" is *006A*, and its name is "Latin small letter j." Similarly, the code point for the Greek letter "θ" is *03B8*, and its name is "Greek small letter theta." Since each character in the universal set is linked to an alphanumeric sequence, the word processor and font you select will determine the "look" of each individual character, that is, what appears on your monitor and what is reproduced by your printer. Keep in mind that any one particular Unicode font does not contain all of the code points from the universal set.

The nice thing about Unicode fonts is that they can be used on multiple platforms (e.g., Macintosh, Windows, Linux), and can be used with all word processing software packages. Unicode fonts also can be used when creating HTML documents for online use. In the past, cross-platform fonts did not exist. Also, there was a limit to the number of characters contained in any one font package; most fonts were limited to 256 characters. Fonts of different languages existed separately as well, making it difficult to switch between writing systems in the same document.

Another advantage of using a Unicode font with IPA symbols is that once the symbols have been typed into a particular document, you can switch to a different Unicode font and all of the symbols will remain intact. The only difference in appearance between fonts would be related to a particular font's size and shape, and whether it is a serif or sans serif font. Prior to the utilization of Unicode, it was not possible to switch fonts without obliterating all of the IPA symbols in a document. Trust me, I know!

A number of Unicode phonetic fonts are available online. Many are available for free and are really quite easy to download and use. The phonetic symbols in this book were created with *Charis SIL*, a Unicode font available from SIL International (see "Online Resources" at the end of this chapter). This font contains over 2000 characters. *Doulos SIL* and *Gentium* are two other Unicode phonetic fonts available for free from the SIL International website.

There are three ways to enter IPA symbols from a Unicode font into a document: (1) make use of software that creates an alternate keyboard layout; (2) enter the code point for each IPA symbol; or (3) insert each symbol individually by using character maps available as part of the Windows and Macintosh operating systems.

The easiest method is to use an alternate keyboard layout. I obtained a specialized keyboard for entering the IPA symbols in this text from the website of the Speech, Hearing and Phonetic Sciences Department at the University College London (UCL) (see "Online Resources" at the end of the chapter). Once the keyboard was installed, all I had to do to enter the symbol /ʃ/ was to simply type SHIFT + "s." Without such a keyboard, it would be necessary to type the unique code point for each character (which is a tedious and time-consuming task). In Microsoft Word (Windows), you would have to type the four-character code point, followed by the sequence ALT + "x," for entry of a particular symbol. For instance, typing the sequence "0283" followed by ALT + "x" will yield the IPA symbol /ʃ/ (without the slash marks). With Mac OS X, you would need to go to *System Preferences,* and select either the *International* or *Language and Text* icon, depending on your version of the operating system. Then, click on the *Input* or *Input Sources* tab, and select the keyboard titled *Unicode Hex Input.* Once you have done this, you would hold down the OPTION key and then type the code point for the phonetic symbol you want. Alternatively, you also could use the "insert symbol" function (Windows) or use the "character palette" (Macintosh) to enter the symbols individually from a character map that shows all of the symbols associated with a particular font. This process is also very tedious and time-consuming.

EXERCISE 1.2

Configure your computer so that you can enter code points into a text document (see "Online Resources" at the end of the chapter for help). Then, enter the following code points and write the corresponding IPA symbol in the blanks provided.

Code Point	**IPA Symbol**
1. 0259	_____
2. 03B8	_____
3. 028A	_____
4. 0271	_____
5. 0279	_____

A Note on Pronunciation and Dialect

As you read this book, and as you attempt to answer the various exercises, please keep in mind that English pronunciation varies depending upon individual speaking style as well as on **dialect**. A dialect is a variation of speech or language based on geographical area, native language background, and social or ethnic group membership. Dialect involves not only pronunciation of words but also grammar (syntax) and vocabulary usage. As you will see in Chapter 9, there is no one fixed standard of English in the United States as is the case in other countries. Instead, Americans speak several different varieties of English depending upon the region of the country in which they live. Additionally, dialects such as African American English and Chicano English have particularly strong ties to ethnic group membership even though regional variations do exist among these dialects. The population of the United States contains many

foreign-born residents who have learned English as a second language. The dialect of English spoken by a foreign-born individual is affected, at least in part, by her native language. This is because foreign languages have a different set of speech sounds than those we use in English. There are sounds that are present in English that are not present in the foreign language, and vice versa. For example, English has 14 vowels, whereas Spanish has only 5 vowels. Therefore, when a native Spanish speaker is learning English, it is not uncommon for the speaker to substitute one of the 5 Spanish vowels for an English vowel that does not exist in the Spanish vowel system, contributing to the person's "accent."

Knowledge of dialects is extremely important when establishing a treatment plan for individuals with a communication deficit and whose speech patterns reflect regional or ethnic dialectal variation. Because a dialect should not be considered a substandard form of English, a speech-language pathologist should be concerned only with remediation of clients' speech sound errors, not their dialects.

The pronunciations used in this book often reflect the author's Midwest (northern Ohio) pronunciation patterns. This does not mean that alternate pronunciations are wrong! The numerous text and recorded examples, as well as the answer key, may not be indicative of the way *you* pronounce a particular word or sentence. Always check with your instructor for alternate pronunciations of the materials found in this book and on the supplemental CDs.

Study Questions

1. What is a *phonetic alphabet*?
2. Why is it important to use a phonetic alphabet in transcription of individuals with speech sound disorders?
3. Why is there variation in phonetic transcription from professional to professional?
4. What is the difference between *phonetics* and *phonology*?
5. What is a Unicode font? What are the advantages of using such a font?
6. What are three ways you can enter phonetic symbols into a document using a Unicode font?

Online Resources

Penn State Teaching and Learning with Technology. (2013). *Computing with accents, symbols and foreign scripts—Typing with non-English keyboards*. Retrieved from *http://symbolcodes.tlt.psu.edu/keyboards*
(information regarding phonetic font keyboards)

SIL International. (2014). *IPA Unicode keyboards*. Retrieved from *http://scripts.sil.org/cms/scripts/page.php?site_id=nrsi&id=UniIPAKeyboard*
(keyboarding information)

SIL International. (2014). *Welcome to computers and writing systems*. Retrieved from *http://scripts.sil.org/Home*
(phonetic fonts)

The Unicode Consortium. (1991–2014). Retrieved from *http://www.unicode.org*
(information regarding the most current Unicode standard; access to character code charts for all the world's languages, the IPA, and many different symbol and character sets)

University College London (UCL) Speech, Hearing and Phonetic Sciences. (2013). *Phonetic symbols, keyboards and transcription*. Retrieved from *http://www.phon.ucl.ac.uk/resource/phonetics.php* (phonetic font keyboard)

Wells, John. (2013). *The International Phonetic Alphabet in Unicode*. University College London (UCL) Speech, Hearing and Phonetic Sciences. Retrieved from *http://www.phon.ucl.ac.uk/home/wells/ipa-unicode.htm* (Unicode code points for the IPA symbols)

Wood, Alan. (2013). *Alan Wood's Unicode resources: Unicode and multilingual support in HTML, fonts, web browsers and other applications*. Retrieved from *http://www.alanwood.net/unicode/* (information about Unicode fonts)

CHAPTER

2 Phonetic Transcription of English

Learning Objectives

After reading this chapter you will be able to:

1. Contrast the differences between spelling and sound in English.
2. Describe the various sections of the IPA chart.
3. Define and contrast the terms *phoneme*, *allophone*, and *morpheme*.
4. Define and describe the components of a syllable.
5. Identify primary stress in words.
6. Describe the differences between broad and narrow transcription.

As you begin your study of phonetics, it is extremely important to think about words in terms of how they sound and *not* in terms of how they are spelled. As you begin your study of phonetics, it is extremely important to think about words in terms of how they sound and *not* in terms of how they are spelled. *The repetition of this first sentence is not a typographical error*. The importance of this concept cannot be stressed enough. You *must* ignore the spelling of words and concentrate only on speech sounds. If you have been troubled in the past with your inability to spell, do not fear—phonetics is the one course where spelling is highly discouraged.

For many, ignoring spelling and focusing only on the sounds of words will be a difficult task. Most of us started to spell in preschool or in kindergarten as we learned to read. It was drilled into our heads that "cat" was spelled C-A-T and "dog" was spelled D-O-G. Consequently, we learned to connect the spoken (or printed) words with their respective spellings. Imagine the following fictitious scenario between a parent and a child reading along together before bedtime:

> "OK, Mary. Now, let's think about the word 'cat.' It's spelled C-A-T, but the first speech sound is a /k/ as in 'king,' the second sound is an /æ/ as in 'apple,' and the third sound is a /t/ as in 'table.' Notice that the first sound is really a /k/ even though the word begins with the letter 'c.' When 'c' begins a word, it may sound like /k/ or may sound like /s/, as in the word 'city.' Actually, Mary, there is no phonetic symbol in English that uses the printed letter 'c.'"

Obviously, this type of interchange would cause children to lose any desire to read!

The Difference Between Spelling and Sound

Examine the word "through." Although there are seven printed letters, or **graphemes**, in the word, there are only three speech sounds: "th," "r," and "oo." Now examine the word "phlegm." How many sounds (not letters) do you think are in this word? If you answered four, you are correct—"f," "l," "e," and "m." Obviously, letters do not always adequately represent the number of sounds in a word. Letters only tell us about spelling; they give no clues as to the actual pronunciation of a word. It is imprecise to talk about a sound that may be associated with a particular alphabet letter (or letters) because the letters may not be an accurate reflection of the sound they represent. For instance, the grapheme "s" represents a different sound in the word "size" than it does in the word "vision." What do you think is the sound associated with the letter "g" in the word "phlegm?"

EXERCISE 2.1

Say each of the following words out loud to determine the number of sounds that comprise each one. Write your answer in the blank.

Examples:

3	reed	4	frog	4	wince
_____	lazy	_____	smooth	_____	cough
_____	spilled	_____	driven	_____	oh
_____	comb	_____	why	_____	raisin
_____	thrill	_____	judge	_____	away

An alphabet that contains a separate letter for each individual sound in a language is called a **phonetic alphabet**. A phonetic alphabet maintains a one-to-one relationship between a sound and a particular letter. Our (Roman) alphabet is not phonetic because it contains only 26 alphabet letters to represent approximately 42 English speech sounds. In elementary school we all learned that the English vowels were "a, e, i, o, u, and sometimes y." In actuality, there are approximately 14 vowel sounds in our language, but we don't have 14 different letters to represent them.

Because the Roman alphabet contains fewer letters than the number of speech sounds in English, one alphabet letter often represents more than one speech sound. For instance, the grapheme "c," in the words "cent" and "car," represents two different sounds. Likewise, the grapheme "o" represents *six* different sounds in the words "cod," "bone," "women," "bough," "through," and "above." Sometimes the same sequence of letters represents different sounds in English. For instance, the letter sequence "ough" represents four different vowel sounds in the words "through," "bough," "cough," and "rough." (Note that the spelling "ough" also represents the inclusion of the consonant /f/ in the last two words.) These examples provide further evidence why it is inappropriate to discuss sounds in association with letters. After reading the previous

information, how would you answer the question, What is the sound of the letter "o" or the letters "ough?"

Another way sound and spelling differ is that the same sound can be represented by more than one letter or sequence of letters. **Allographs** are different letter sequences or patterns that represent the same sound. The following groups of words contain allographs of a particular sound, represented by the underlined letters. You will see that the sound associated with some allographs is predictable, while the sound associated with others is not. Keep in mind that for each example, although the spelling is different, *the sounds they represent are the same*.

l<u>oo</u>p, thr<u>ou</u>gh, thr<u>ew</u>, fr<u>ui</u>t, can<u>oe</u>

m<u>ai</u>l, conv<u>ey</u>, h<u>a</u>te, st<u>ea</u>k

tr<u>i</u>te, tr<u>y</u>, tr<u>ie</u>d, <u>ai</u>sle, h<u>ei</u>ght

<u>f</u>or, lau<u>gh</u>, <u>ph</u>oto, mu<u>ff</u>in

<u>sh</u>oe, <u>S</u>ean, cau<u>t</u>ion, pre<u>c</u>ious, ti<u>ss</u>ue

<u>e</u>ked, v<u>i</u>sa, h<u>ee</u>d, m<u>ea</u>t

Note in some of the examples that *pairs* of letters often represent one sound because there are simply not enough single alphabet letters to represent all of the sounds of English. These pairs of letters are called **digraphs**. Digraphs may be the same two letters (as in "h<u>oo</u>t," "h<u>ee</u>d," or "ti<u>ss</u>ue") or two completely different letters (as in "<u>sh</u>oe," "st<u>ea</u>k," or "tr<u>ie</u>d").

EXERCISE 2.2

Examine the underlined sounds (letter combinations) in the words in each row. Place an "X" in front of the one word that does not share an allograph with the others.

Examples:

	_____	r<u>ai</u>d	_____	c<u>a</u>ke	_____	h<u>ey</u>	__X__	b<u>a</u>ck
1.	_____	<u>sh</u>oe	_____	mea<u>s</u>ure	_____	o<u>ce</u>an	_____	suffi<u>ci</u>ent
2.	_____	<u>ch</u>ord	_____	li<u>q</u>uor	_____	bis<u>cu</u>it	_____	ra<u>g</u>
3.	_____	m<u>oo</u>n	_____	th<u>rough</u>	_____	th<u>ough</u>	_____	s<u>ui</u>t
4.	_____	w<u>oo</u>d	_____	d<u>o</u>ne	_____	fl<u>oo</u>d	_____	r<u>u</u>b
5.	_____	i<u>c</u>e	_____	wa<u>s</u>	_____	pre<u>ss</u>	_____	<u>sc</u>issors

Another oddity of the spelling of words involves *silent letters*. Although the word "plumb" has five graphemes, the final letter has no connection to the pronunciation of the word. Consequently, "plumb" has only four speech sounds. These "silent" letters also can be found in the words "gnome," "psychosis," "rhombus," and "pneumonia."

Many oddly spelled English words, and those that contain silent letters, are often related to the origin of a word, and usually reflect a spelling common to the language from which it was borrowed. For example, words such as "pneumonia," "rhombus," and "cyst" are derived from the Greek language, helping

explain their particular spellings. In addition, we borrow entire words from other languages, keeping their spelling intact. This only adds to our spelling irregularities. Examples of some words borrowed from other languages include:

quiche (French)	karaoke (Japanese)
kielbasa (Polish)	chutzpah (Yiddish)
sauerkraut (German)	taekwondo (Korean)
tequila (Spanish)	lasagna (Italian)

Morphemes

If our system of spelling is so irregular, how are we ever able to learn the complexities of the English language? How do we learn to read and write? Actually, our English spelling system is not as odd as it appears. In fact, only about 25 percent of the words in English have irregular spellings (Crystal, 1987). Unfortunately, many of the irregularly spelled words tend to be the ones used often in our language.

One key to the regularity of oddly spelled words can be found if we study the spelling patterns among words that share similar meaningful linguistic units, or morphemes. A **morpheme** is the smallest unit of language capable of carrying meaning. For instance, the word "book" is a morpheme. The word "book" carries meaning because it connotes an item that is composed of pages with print, binding, two covers, and so on. The word "chair" is also a morpheme; it conveys meaning.

Now consider the word "books." It contains two morphemes, the morpheme "book" and the plural morpheme, represented by -s. The -s ending indicates the plural form of the word, that is, more than one book. Since -s carries meaning, it is a morpheme. Other examples of morphemes include regular verb endings (such as -ed and -ing as in the words "walked" and "calling"), prefixes (such as pre- and re- as in "prepaid" and "reread"), and suffixes (such as -tion in "constitution" and -ive as in "talkative"). Notice that syllables and morphemes are not the same thing. It is possible for a one-syllable word, such as "books" or "walked" to have more than one morpheme. Also, it is possible for words with more than one syllable to be comprised of only one morpheme (e.g., "celery" and "asparagus").

Take a moment to examine the following three pairs of words. Notice that each word pair shares the same morpheme. Say each pair aloud. What do you notice?

*music music*ian *phlegm phlegm*atic *press press*ure

Hopefully, you noted that although each pair shares the same morpheme, the pronunciation of the morphemes in each pair is different. English morphemes tend to be spelled the same even though the words that share them are pronounced in a different manner. English spelling may not appear to be so odd if one considers the spelling of the morphemes that form the roots of many irregularly spelled English words (MacKay, 1987).

Morphemes that can stand alone and still carry meaning, such as "book," "phlegm," "music," or "press," are called **free morphemes**. Morphemes (bold) such as **pre**(date), **re**(tread), (book)**s**, (music)**ian**, and (press)**ure** are called **bound morphemes** because they are bound to other words and carry no meaning when they stand alone.

EXERCISE 2.3

For each item below, think of another word that shares the same morpheme.

Example:

create ___creation___

1. deduce	_____	6. great	_____
2. protect	_____	7. honest	_____
3. potent	_____	8. decent	_____
4. scrutiny	_____	9. late	_____
5. labor	_____	10. magnet	_____

EXERCISE 2.4

Indicate the number of morphemes in each of the following words.

Examples:

__1__ cucumber __2__ reading __3__ reworked

_____ caution	_____ running	_____ lived	_____ relistened
_____ warmly	_____ finger	_____ talker	_____ kangaroo
_____ prorated	_____ clarinetist	_____ sharply	_____ swarming

Phonemes

Because it is difficult to use the Roman alphabet to represent speech sounds, the IPA has been adopted by linguists, phoneticians, and speech and hearing professionals for the purpose of speech transcription. The IPA was created for adoption by languages worldwide by the International Phonetic Association, formed in 1886. The IPA symbols are consistent from language to language. For example, the English word "sit" and the German word "mit" (meaning "with") both have the same vowel. Therefore, we would use the same vowel symbol to transcribe these words (/sɪt/ and /mɪt/, respectively). If you were familiar with all of the IPA symbols, you would be capable of transcribing languages other than English. Keep in mind that you would need to know the IPA symbols for speech sounds that are not part of the English language. A list of all the common IPA symbols used in English is located in Table 2.1. The complete IPA chart (revised to 2005) is located in Figure 2.1. Take some time to examine the IPA chart. There are several sections of the chart that need to be highlighted. The large area at the top, labeled CONSONANTS (PULMONIC), shows all the consonants of the world's languages that are produced with an airstream from the lungs. All English consonants are pulmonic consonants. Many of these symbols may appear foreign to you. Compare the IPA pulmonic consonants with the English consonant symbols given in Table 2.1. You will see that many of the

TABLE 2.1 The IPA Symbols for American English Phonemes.

	Symbol	Key Word
Vowels	/i/	key
	/ɪ/	win
	/e/	rebate
	/ɛ/	red
	/æ/	had
	/u/	moon
	/ʊ/	wood
	/o/	okay
	/ɔ/	law
	/ɑ/	cod
	/ə/	about
	/ʌ/	bud
	/ɚ/	butter
	/ɝ/	bird
Diphthongs	/aʊ/	how
	/aɪ/	tie
	/ɔɪ/	boy
	/eɪ/	bake
	/oʊ/	rose
Consonants	/p/	pork
	/b/	bug
	/t/	to
	/d/	dog
	/k/	king
	/g/	go
	/m/	mad
	/n/	name
	/v/	vote
	/ŋ/	ring
	/f/	for
	/θ/	think
	/ð/	them
	/s/	say
	/z/	zoo
	/ʃ/	ship
	/ʒ/	beige
	/h/	hen
	/tʃ/	chew
	/dʒ/	join
	/w/	wise
	/j/	yet
	/r/	row
	/l/	let

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

CONSONANTS (PULMONIC) © 2005 IPA

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k g	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

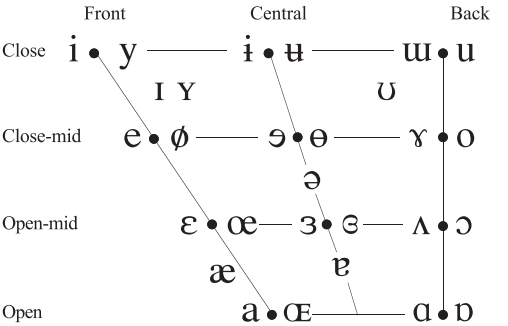
Clicks		Voiced implosives		Ejectives	
ʘ	Bilabial	ɓ	Bilabial	’	Examples:
|	Dental	ɗ	Dental/alveolar	pʼ	Bilabial
!	(Post)alveolar	ʄ	Palatal	tʼ	Dental/alveolar
ǂ	Palatoalveolar	ɠ	Velar	kʼ	Velar
‖	Alveolar lateral	ʛ	Uvular	sʼ	Alveolar fricative

OTHER SYMBOLS

ʍ	Voiceless labial-velar fricative	ɕ ʑ	Alveolo-palatal fricatives
w	Voiced labial-velar approximant	ɺ	Voiced alveolar lateral flap
ɥ	Voiced labial-palatal approximant	ʢ	Simultaneous ʃ and x
ʜ	Voiceless epiglottal fricative		
ʡ	Voiced epiglottal fricative		
ʡ	Epiglottal plosive		

Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary. k͡p t͡s

VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

SUPRASEGMENTALS

ˈ	Primary stress
ˌ	Secondary stress ˌfoʊnəˈtɪʃən
ː	Long eː
ˑ	Half-long eˑ
˘	Extra-short ĕ
|	Minor (foot) group
‖	Major (intonation) group
.	Syllable break ɹi.ækt
‿	Linking (absence of a break)

DIACRITICS Diacritics may be placed above a symbol with a descender, e.g. n̊ŋ

◌̥	Voiceless	n̥ d̥	◌̤	Breathy voiced	b̤ a̤	◌̪	Dental	t̪ d̪
◌̬	Voiced	s̬ t̬	◌̰	Creaky voiced	b̰ a̰	◌̺	Apical	t̺ d̺
◌ʰ	Aspirated	tʰ dʰ	◌̼	Linguolabial	t̼ d̼	◌̻	Laminal	t̻ d̻
◌̹	More rounded	ɔ̹	◌ʷ	Labialized	tʷ dʷ	◌̃	Nasalized	ẽ
◌̜	Less rounded	ɔ̜	◌ʲ	Palatalized	tʲ dʲ	◌ⁿ	Nasal release	dⁿ
◌̟	Advanced	u̟	◌ˠ	Velarized	tˠ dˠ	◌ˡ	Lateral release	dˡ
◌̠	Retracted	e̠	◌ˤ	Pharyngealized	tˤ dˤ	◌̚	No audible release	d̚
◌̈	Centralized	ë	◌̴	Velarized or pharyngealized	ɫ			
◌̽	Mid-centralized	e̽	◌̝	Raised	e̝	(ɹ̝ = voiced alveolar fricative)		
◌̩	Syllabic	n̩	◌̞	Lowered	e̞	(β̞ = voiced bilabial approximant)		
◌̯	Non-syllabic	e̯	◌̘	Advanced Tongue Root	e̘			
◌˞	Rhoticity	ɚ a˞	◌̙	Retracted Tongue Root	e̙			

TONES AND WORD ACCENTS

LEVEL			CONTOUR		
e̋ or	˥	Extra high	ě or	˩˥	Rising
é	˦	High	ê	˥˩	Falling
ē	˧	Mid	e᷄	˧˥	High rising
è	˨	Low	e᷅	˩˧	Low rising
ȅ	˩	Extra low	e᷈	˥˩˥	Rising-falling
↓		Downstep	↗		Global rise
↑		Upstep	↘		Global fall

FIGURE 2.1 The International Phonetic Alphabet (revised to 2005). Reprinted with permission from The International Phonetic Association. Copyright 2005 by International Phonetic Association. www.langsci.ucl.ac.uk/ipa/

symbols in the IPA chart represent sounds not present in spoken English. However, some of the non-English symbols are used in transcription of disordered speech. This will be discussed in some detail in Chapter 8. Also, call your attention to the section of NON-PULMONIC CONSONANTS that are produced without the need for airflow from the lungs. Non-pulmonic consonants include the "clicks" often heard in some African languages.

A very important section of the IPA chart is labeled VOWELS. You will note that the vowels are placed in various locations around a four-sided figure. This *quadrilateral* is a schematic drawing of a speaker's mouth, or oral cavity. The placement of the vowel symbols within the quadrilateral is *roughly* based on where the tongue is located during production of the various vowels. As with the consonants, many of the IPA vowel symbols are representative of speech sounds not found in English.

The area marked DIACRITICS presents another array of specialized symbols that are used in conjunction with the IPA consonant and vowel symbols. **Diacritics** are employed to indicate an alternate way of producing a certain sound. The use of diacritical markings is explained in more detail in Chapter 8.

The last section of the IPA chart most important for our purposes is labeled SUPRASEGMENTALS. The suprasegmental symbols are used to indicate the stress, intonation pattern, and tempo of any particular utterance in a language.

As you look over the entire chart, you will notice that many of the unfamiliar symbols appear similar to the letters of the Roman alphabet. This was one of the guiding principles of the International Phonetic Association when creating the symbols for the IPA. That is, all symbols of the IPA were designed to blend in with the letters of the Roman alphabet (*Handbook of the International Phonetic Association,* 1999).

Initially, the IPA chart will be confusing to you. As you progress through this text, the IPA chart will become less confusing and more meaningful in your study of phonetics. Some good websites that will help you become acquainted with all of the sounds and symbols of the IPA can be found in the "Online Resources" at the end of the chapter.

EXERCISE 2.5

Examine the vowel symbols in Table 2.1. Which vowel symbol would be used to transcribe each vowel in the following words?

Example:

beast i

1.	lend	_____	4.	should	_____
2.	man	_____	5.	rude	_____
3.	flick	_____	6.	week	_____

EXERCISE 2.6

Examine the consonant symbols in Table 2.1. Which consonant symbol would be used to transcribe the *last* consonant in each of the following words? Hint: Listen to the last sound in each word as you say it aloud. Remember: Forget about spelling!

Examples:

dog g

rich tʃ

1. ram ____
2. laugh ____
3. wish ____
4. sung ____
5. bath ____
6. leave ____

EXERCISE 2.7

Which vowel or consonant IPA symbol would you use when transcribing the sounds represented by the digraphs (underlined) in the following words? Write your answer in the blank. (Consult Figure 2.1 and Table 2.1 to assist in completing this exercise.)

1. shoe _____
2. them _____
3. chew _____
4. guilt _____
5. wood _____
6. rough _____
7. mocked _____
8. wing _____
9. exaggerate _____
10. biscuit _____
11. vision _____
12. labor _____

Because the IPA is a phonetic alphabet, each symbol represents one specific speech sound, or **phoneme**. A phoneme is a speech sound that is capable of differentiating morphemes, and therefore is capable of distinguishing meaning. Note that a morpheme (such as "look") is composed of a string of individual phonemes. A change in a single phoneme always will change the identity and meaning of the morpheme. For example, by changing the initial phoneme from /l/ to /b/, the morpheme "look" becomes "book." Using our definition of phoneme, we can say that the phoneme /l/ (or the phoneme /b/) differentiates the two morphemes "look" and "book." By changing the final phoneme from /t/ to /b/ the morpheme "cat" is distinguished from the morpheme "cab." In these two examples, a change of only one phoneme results in the creation of two morphemes (words, in this case) with completely different meaning. Words that vary by only one phoneme (in the same word position) are called **minimal pairs** or **minimal contrasts**. "Look"/"book" and "cat"/"cab" are examples of minimal pairs because they vary by only one phoneme. In "look"/"book," the phoneme variation occurs at the beginning of the word, and in "cat"/"cab" the

phonemes vary at the end of the word. Other examples of minimal pairs include "hear"/"beer," "through"/"brew," "clip"/"click," and "brine"/"bright." Notice that these words differ by only *one speech sound* even though spelling shows more than one letter change.

EXERCISE 2.8

For each word below, create a minimal pair by writing a word in the blank. The first five minimal pairs should reflect a change in the initial phoneme; the second five should involve a change in the final phoneme.

Examples: initial phoneme change — seal — meal
final phoneme change — card — cart

initial phoneme change		*final phoneme change*	
1. tame	_____	6. heart	_____
2. late	_____	7. tone	_____
3. call	_____	8. web	_____
4. could	_____	9. cheap	_____
5. boil	_____	10. rub	_____

EXERCISE 2.9

Place an "X" next to the word pairs that are examples of minimal pairs.

_____ 1. kale, mail	_____ 6. find, fanned
_____ 2. blog, blot	_____ 7. daughter, slaughter
_____ 3. smart, smarts	_____ 8. twitch, switch
_____ 4. rinse, sins	_____ 9. rings, brings
_____ 5. bird, burned	_____ 10. limes, rhymes

Complete Assignment 2-1.

Allophones: Members of a Phoneme Family

Up to this point, the term *phoneme* has been discussed as a speech sound that can distinguish one morpheme from another. However, there is another way to define *phoneme*. We could also say that a phoneme is a family of sounds. Speech sounds are not always produced the same way in every word. For example the /l/ in the word "lip" is different from the /l/ in the word "bottle." You might say to yourself: How are they different? They are both /l/s. You need to consider how these /l/ sounds are produced in the mouth when saying these two words. In "lip," the /l/ is produced with the tongue toward the front of the mouth, and in the word "bottle" the /l/ is produced in the back of the mouth.

Say them to yourself and you will discover that this is indeed true. These are but two examples of the /l/ family of sounds.

Members of a phoneme family are actually variant pronunciations of a particular phoneme. These variant pronunciations are called **allophones**. The front (or light) /l/ and the back (or dark) /l/ are allophones or variant productions of the phoneme /l/. These two variants both can be found in the word "little" (the first /l/ is light; the second is dark). Try saying "little" by using the dark /l/ at the beginning of the word. Although the word may sound funny to you, it is still recognizable as the word "little." For this reason, the variants of /l/ are not individual phonemes. Saying the word "little" with either the front or back /l/ at the beginning of the word *does not change the identity or meaning of the original word*. That is, it does not result in the creation of a minimal pair.

EXERCISE 2.10

Try saying the /p/ sound in the word "keep" two different ways:

1. exploding (or releasing) the /p/
2. not exploding the /p/

(These are two allophones of the /p/ phoneme.)

Certain allophones must be produced a particular way due to the constraints of the other sounds in a word, that is, the *phonetic context*. For instance, the /k/ sound in the word "kid" is produced close to the front of the mouth because the vowel that follows it is a "front vowel," that is, a vowel produced toward the front of the mouth. On the other hand, the /k/ sound in "could" is produced farther back in the mouth because the vowel following /k/ is a "back vowel"—produced toward the back of the mouth. Say the two words, paying attention to the position of your lips and tongue as you pronounce them. Hopefully, you will see that there is a difference in the position of your speech organs. These two allophones of /k/ are *not* interchangeable due to the phonetic constraints of the vowel in each word. These allophones are said to be in **complementary distribution**. That is, these two allophones of /k/ are found in distinctly different phonetic environments and are not free to vary in terms of where in the mouth they may be produced.

Another example of complementary distribution involves production of /p/ in the words "pit" and "spit." In English, when /p/ is produced at the beginning of a word, a small puff of air occurs after its release. The puff of air is called *aspiration*. Say the word "pit" holding your hand in front of your mouth. You should be able to feel the puff of air escaping from your lips following the production of /p/. Whenever the phoneme /p/ follows the phoneme /s/, as in the word "spit," it will always be *unaspirated*. Say the word "spit" holding your hand in front of your mouth. You should feel less air than when you said the word "pit." Hold your hand in front of your mouth alternating the productions of these two words. You should be able to feel the variance in the airstream on your hand. These two allophones of /p/, aspirated and unaspirated, are in complementary distribution. In English, unaspirated phonemes never occur in the initial position of a word. However, unaspirated phonemes do occur at the

beginning of words in many other languages including Vietnamese, Spanish, Mandarin Chinese, and Tagalog.

In contrast to the examples just given, some allophones are not linked to phonetic context and therefore can be exchanged for one another; they are free to vary. In Exercise 2.10 you were asked to say the word "keep" two different ways, either releasing the /p/ or not. In this case, it is up to the speaker to decide. The phonetic environment has no bearing on whether the /p/ will be exploded. In this case, the allophones of /p/ are said to be in **free variation**. Likewise, the final /t/ in the word "hit" may be released or unreleased, depending on the speaker's individual production of the word. These two variant productions (released or unreleased) are allophones of /t/ that are in free variation.

Syllables

In conversational speech, it is often difficult to determine where one phoneme ends and the next one begins. This is due to the fact that in connected speech, phonemes are not produced in a serial order, one after the other. Instead, phonemes are produced in an overlaid fashion due to overlapping movements of the articulators (speech organs) during speech production. Because there is considerable overlap in phonemes during the production of speech, many phoneticians and linguists suggest that the smallest unit of speech production is not the allophone or phoneme, but the **syllable**.

As you know, words are composed of one or more syllables. We all have a general idea of what a syllable is. If you were asked how many syllables were in the word "meatball," you would have little difficulty determining the correct answer—two. Even though you have a general idea of what a syllable is, in actuality it is quite difficult to answer the seemingly simple question, *What is a syllable?* The reason for this difficulty is that a syllable may be defined in more than one way. Also, phoneticians and linguists often do not agree on the actual definition of a syllable.

We will begin our definition by stating that a syllable is a basic building block of language that may be composed of either one vowel alone, or a vowel in combination with one or more consonants. This is the definition typically found in a dictionary or in a junior high school language arts textbook. However, for our purposes, this definition is not adequate. This definition is based on vowel and consonant letters, not vowel and consonant phonemes.

In most cases, it is easy to identify the number of syllables in a word. For instance, we would agree that the words "control," "intend," and "downtown" all have two syllables. Likewise, it is easy to determine that the words "contagious," "alphabet," and "tremendous" each have three syllables. However, it is not always so easy to determine the number of syllables in a word. Using our simple dictionary definition, the words "feel" and "pool" would be one-syllable words. That is, they each contain a vowel in combination with one or more consonant letters. Many individuals, however, pronounce these words as two syllables. On the other hand, some people pronounce these words as one syllable depending on their individual speaking style and dialect. The word "pool" is pronounced by many as "pull," as in "swimming pull." Likewise, some southern speakers pronounce the word "feel" as "fill," as in "I fill fine."

Another example involves the words "prism" and "chasm." According to the basic definition, these words would be considered one syllable because

they contain only one vowel. However, most speakers would probably consider these words to consist of two syllables. One last example involves the pronunciation of words like "camera" or "chocolate." These words have three vowels, but can be pronounced as either two or three syllables, depending on whether the speaker pronounces the middle vowel (i.e., "camra" or "choclate"). Both pronunciations would be considered appropriate for either word.

Obviously, a better definition of "syllable" is necessary to help overcome these difficulties. One way to refine our definition might be to more fully describe a syllable's internal structure, using terms other than consonant and vowel. It is possible to divide English syllables into two components: **onset** and **rhyme**. The onset of a syllable consists of all the consonants that precede a vowel, as in the words "**spl**it," "**tr**ied," and "**f**ast" (onset is in bold letters). Note that the onset may consist of either a single consonant or a **consonant cluster** (two or three contiguous consonants in the same syllable).

In syllables with no initial consonant, there would be no onset. Examples of words with no onset would be "eat," "I," and the first syllable in the word "afraid." Note that the second syllable of "afraid" has an onset consisting of the consonants /f/ and /r/.

EXERCISE 2.11

Circle the syllables in the following one-syllable and two-syllable words containing an *onset.* (For the two-syllable words, circle *any* syllable with an onset.)

ouch	crab	hoe	oats	elm	your
react	cargo	beware	atone	courage	eating

The rhyme of a syllable is divided into two components, the **nucleus** and the **coda**. The nucleus is typically a vowel. The nuclei of the words "spl**i**t," "tr**ie**d," and "f**a**st" are indicated in bold letters. However, several *consonants* in English may be considered to be the nucleus of a syllable in certain instances. In the words "chasm" and "feel," the /m/ and /l/ phonemes would be considered to be the nucleus of the second syllable of each word (if "feel" is pronounced as a two-syllable word). In these words, the consonants /m/ and /l/ assume the role of the vowel in the second syllable. When consonants take on the role of vowels, they are called **syllabic consonants**.

The coda includes either single consonants or consonant clusters that follow the nucleus of a syllable, as in the words "spli**t**," "trie**d**," and "fa**st.**" In some instances, the coda may in fact have no elements at all, as in the words "me," "shoe," "oh," and "pry." In these examples, remember to forget spelling and focus on the *sounds* in the words.

EXERCISE 2.12

Circle the letters that make up the *nucleus* in the following words. Some of the words have more than one nucleus.

shrine	scold	plea	produce	schism	away
elope	selfish	auto	biceps	flight	truce

EXERCISE 2.13

Circle the word(s) (or syllables) that have a *coda*.

through	spa	rough	bough	row	spray
lawful	funny	create	inverse	candy	reply

To further illustrate the nomenclature associated with syllables, the structure of the one-syllable words "scrub," "each," and "three" are detailed in "tree diagrams" (Figure 2.2). The onset, rhyme, nucleus, and coda of each word are labeled appropriately. The Greek letter sigma (σ) is used to indicate a syllable division. Note the null symbol (ϕ), which indicates the absence of the onset and coda in two of the examples. Diagrams of the two-syllable words "behave" and "prism" follow the diagrams of the one-syllable words (see Figure 2.3). Notice in Figure 2.3 that the consonant /m/ in "prism" forms the nucleus of the second syllable.

Syllables that end with a vowel phoneme (no coda) are called **open syllables**. Examples include "the" and both syllables of the word "maybe." Words that consist solely of a vowel nucleus, as in the words "I," "oh," and "a,"

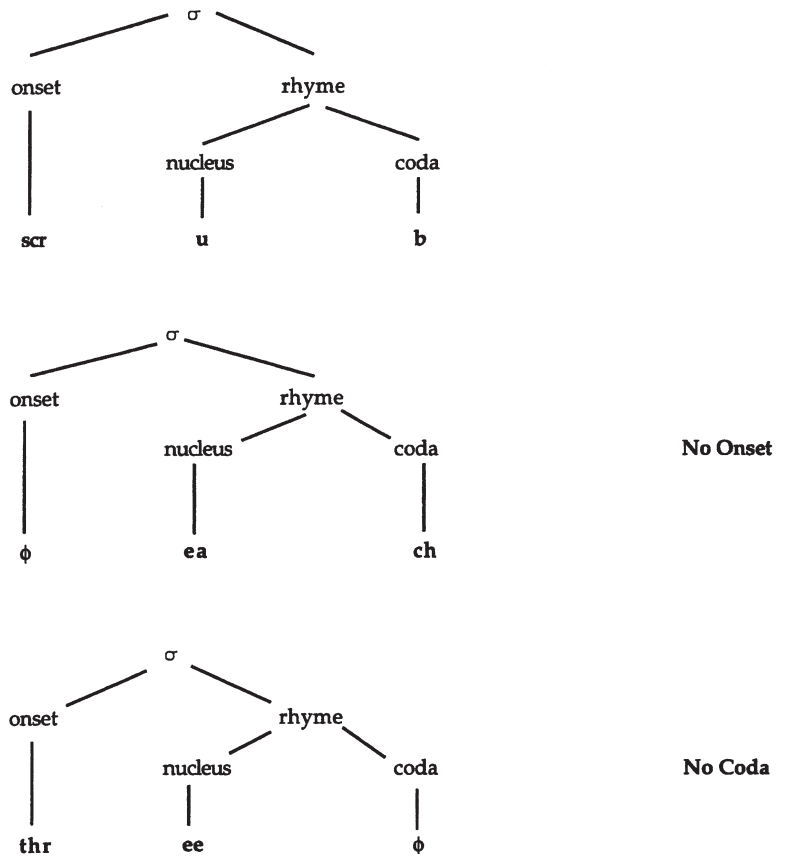


FIGURE 2.2 Syllable structure of the one-syllable words "scrub," "each," and "three."

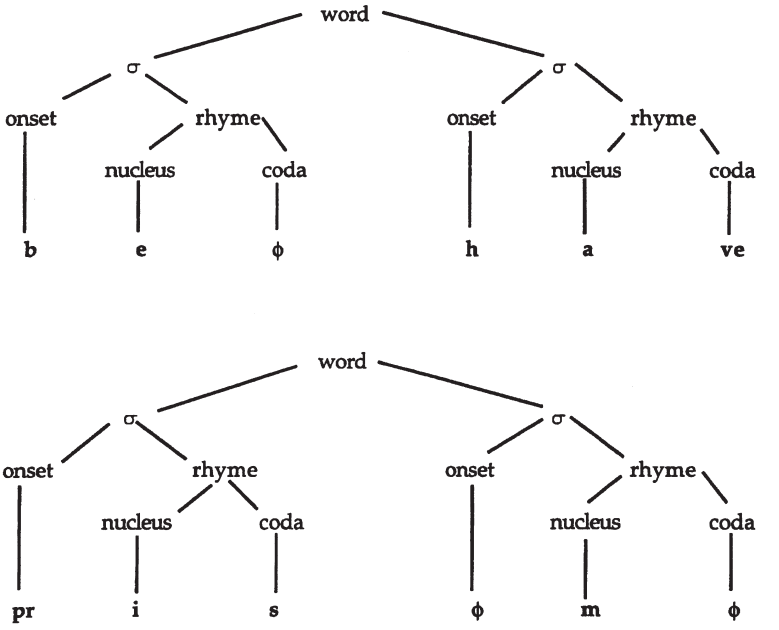


FIGURE 2.3 Syllable structure of the two-syllable words "behave" and "prism."

also are considered to be open syllables. Syllables with a coda—that is, those that end with a consonant phoneme—are called **closed syllables**. Examples of closed syllables are "had," "keg," and both syllables in the word "contain." When determining whether a syllable is open or closed, you need to pay attention to the phonemic specification of the syllable, not its spelling. More examples of open and closed syllables are given below.

Words with Open Syllables		***Words with Closed Syllables***	
One-Syllable	*Two-Syllable*	*One-Syllable*	*Two-Syllable*
he	allow	corn	captive
bow	daily	suave	chalice
may	belie	wish	dentist
rye	zebra	charge	English
through	hobo	slammed	invest

EXERCISE 2.14

Examine the following two-syllable words. Indicate whether the *first* syllable is open (O) or closed (C) by filling in the blank with the appropriate letter.

Examples:		O	around	C	blistered		
____	pliant	____	comply	____	coerced	____	minutes
____	decree	____	encase	____	flatly	____	preface

EXERCISE 2.15

Examine the same two-syllable words as those in the previous exercise. Indicate whether the *second* syllable is open (O) or closed (C) by filling in the blank with the appropriate letter.

Examples:		C	around	C	blistered		
____	pliant	____	comply	____	coerced	____	minutes
____	decree	____	encase	____	flatly	____	preface

Word Stress

In words with more than one syllable, there will be one syllable that will be produced with the greatest force or greatest muscular energy. The increased muscular energy will cause the syllable to stand apart from the others due to greater emphasis of the syllable. This increased emphasis in the production of one syllable is commonly referred to as **word stress** or **lexical stress**. The increase in muscular force or emphasis results in a syllable that is perceived by listeners as longer in duration, higher in pitch, and, to a lesser extent, louder (i.e., greater in intensity). The rise in pitch is particularly important in alerting listeners to the stressed syllable in a word (Lehiste, 1970). Phoneticians also refer to word stress, or lexical stress, as *word accent* (Calvert, 1986; Cruttenden, 2008).

Stress is not a trivial matter in learning and understanding spoken language. When we hear a word such as "confuse," we recognize it not only because of the particular phonemes that comprise it, but also because of the inherent stress pattern of the word. Try saying this word by changing the stress to the first syllable, that is, CONfuse. The word now sounds somewhat odd to you because the string of phonemes does not coincide with the new stress pattern. The unique combination of these individual phonemes and this particular stress pattern does not match any item stored in your mental dictionary. As language is developed, children (not just those learning English) must master not only the phonemes that make up individual words, but also their associated stress patterns. However, the stress patterns of different languages vary remarkably. One major reason why foreign speakers of English (or any second language) have difficulty with pronunciation is due to lack of knowledge of the stress patterns of the new language being learned. Second-language learners will often sound "foreign," that is, have an "accent," when using the stress pattern of their native language while speaking a second language.

In English, words that have more than one syllable will always have one particular syllable that will receive *primary stress* (i.e., the greatest emphasis). For example, the bisyllabic (two-syllable) word "SISter" has primary stress on the first syllable. The multisyllabic (more than two-syllable) word "courAgeous" has primary stress on the second syllable. Syllables in bisyllabic and multisyllabic words that do not receive primary stress may receive *secondary stress* or no stress, depending on the level of emphasis given to the individual syllable.

Word (lexical) stress is extremely important in learning the phonetic transcription of English because some of the IPA symbols indicate which syllable in a word receives primary stress. Although it is possible to learn how to mark levels of stress in multisyllabic words (i.e., primary versus secondary stress), for now we will focus primarily on indicating whether a syllable receives primary stress.

Some students will experience little difficulty in identifying the syllable with primary stress in bisyllabic and multisyllabic words. Unfortunately, for many this ability is extremely trying. Part of the reason for this difficulty is that although we know how to use stress correctly in *production of speech*, we are not accustomed to thinking about stress patterns in the *perception of speech*. As communicators, we simply are not used to listening to speech and identifying stressed syllables in words. Researchers have been successful in enumerating the rules that govern the location of primary stress in words (Chomsky & Halle, 1968; Cruttenden, 2008; Jones, 1967). However, the rules do have exceptions, and they are also difficult to remember. During transcription of speech, there is simply not enough time to think about the rules governing stress in words. For purposes of phonetic transcription, what is important is the ability to hear the location of primary stress in words, not the rules that govern how stress is assigned to syllables. Fortunately, the ability to identify (hear) the location of primary stress in words can be developed in time with much listening practice.

Examine the following bisyllabic words. Say them aloud. What do you notice about the stress patterns of these words? (**Hint:** They all have the *same* stress pattern.)

contain	aware	berserk	charade
inspect	reveal	suppose	detain

Hopefully, you determined that the *second* syllable of each of these words receives primary stress. Say the words again, paying careful attention to the increased pitch associated with the second syllable:

conTAIN	aWARE	berSERK	chaRADE
inSPECT	reVEAL	supPOSE	deTAIN

The IPA symbol used for indicating the primary stress of a word is a raised mark (ˈ) placed at the initiation of the stressed syllable. The words above would be marked in the following manner to indicate second-syllable stress:

conˈtain	aˈware	berˈserk	chaˈrade
inˈspect	reˈveal	supˈpose	deˈtain

Now, examine the following bisyllabic words. Each of these words contain *first* syllable primary stress:

ˈteacher	ˈcertain	ˈcareful	ˈpractice
ˈplural	ˈlarynx	ˈprimate	ˈcontact

EXERCISE 2.16

One word in each row does *not* have the same stress pattern as the others. Circle the word that does not have the same stress pattern.

1.	dandruff	shampoo	bottle	fragrance
2.	cologne	soufflé	surreal	careful
3.	always	never	okay	maybe
4.	Marie	Sarah	April	Lizzie
5.	intrude	instruct	invade	injure

Word stress, in addition to its role in pronunciation, also helps differentiate words that are spelled the same but vary in part of speech, or **word class** (i.e., whether a word is a noun, verb, adjective, adverb, etc.). For instance, the words "ˈcontract" (noun) and "conˈtract" (verb), although spelled the same, have different stress patterns. The noun form ˈ*contract* has stress placed on the first syllable, whereas the verb form *conˈtract* has word stress on the second syllable. Note that the change in the stress pattern not only changes the meaning of the word, but also changes its pronunciation. Say these two words aloud. How do the two words differ in pronunciation? You probably noted that as stress changes, vowel pronunciation changes in one or both syllables. Other examples of two-syllable noun/verb pairs differing in word stress include:

Noun	***Verb***	***Noun***	***Verb***
ˈconflict	conˈflict	ˈpermit	perˈmit
ˈrecord	reˈcord	ˈsubject	subˈject
ˈdigest	diˈgest	ˈrebel	reˈbel
ˈconvert	conˈvert	ˈconduct	conˈduct

Note that in these word pairs, the noun form always receives first-syllable stress, and the verb form always receives second-syllable stress.

EXERCISE 2.17

Circle the words that can be spoken as both a noun *and* a verb by shifting the stress pattern between the first and second syllables.

propose	contest	protest	congress	research
project	consume	compress	reasoned	confines

CD #1 Track 1

Because identifying the primary stress in bisyllabic and multisyllabic words is a difficult chore, the following 12 word lists will provide you with some practice in listening for primary stress in words. These word lists (and accompanying exercises) are designed to make you focus on one particular stress pattern at a time. The lists begin with bisyllabic words and progress to multisyllabic words. As you examine each list, say the words aloud, focusing on the particular stress pattern being demonstrated. Listen to each list several times until you are comfortable with the stress pattern being demonstrated. If you experience any difficulty with Exercises 2.18, 2.19, and 2.20, review the word lists until you understand your errors.

CD #1 Track 2

List 1: Bisyllabic words; first-syllable stress (words beginning with "e")

edict	easy	eager	Easter
Egypt	ether	either	even
Ethan	eagle	eater	ego

Note: Keep in mind that words beginning with the letter "e" do not always have first-syllable stress. Examine the words in List 2.

CD #1 Track 3

List 2: Bisyllabic words; second-syllable stress (words beginning with "e")

eclipse	elapse	efface	effect
elate	elect	ellipse	elude
Elaine	emote	enough	erupt

CD #1 Track 4

List 3: Bisyllabic words; first-syllable stress (words beginning with "o")

over	ocean	omen	owner
Oprah	onus	oboe	ogre
okra	open	ozone	odor

Note: Keep in mind that words beginning with the letter "o" do not always have first-syllable stress. Examine the words in List 4.

CD #1 Track 5

List 4: Bisyllabic words; second-syllable stress (words beginning with "o")

overt	obey	oppress	olé
okay	oblique	obese	oblige

CD #1 Track 6

List 5: Bisyllabic words; first-syllable stress (words beginning with "in")

invoice	instant	inbred	insect
inner	inches	ingrate	infant
income	index	infield	inlay

Note: Keep in mind that words beginning with the letters "in" do not always have first-syllable stress. Examine the words in List 6.

CD #1 Track 7

List 6: Bisyllabic words; second-syllable stress (words beginning with "in")

inspire	instead	induce	inject
infect	inflict	indeed	inept
infer	inscribe	intrude	involve

CD #1 Track 8

List 7: Bisyllabic words; second-syllable stress (words beginning with "a")

around	abuse	abort	amass	avoid	abode
away	aware	arise	alike	afloat	avenge
abrupt	adorn	accost	atone	aloof	aghast
alas	akin	avow	adapt	afraid	anoint

Note: There are many words in English (such as those in List 7) that begin with the letter "a." The vowel phoneme associated with the sound at the beginning of these words is called *schwa*, represented with the IPA symbol /ə/. This unstressed vowel constitutes its own syllable in all of the words in List 7.

CD #1
Track 9

List 8: Bisyllabic words; first-syllable stress

engine	master	caring	lucky	staples	Harold
plastic	rowing	neither	happen	Dayton	careful
forest	whisper	quandary	listless	tantrum	nacho
siphon	solo	hidden	trophy	panda	Pittsburgh

Note: Most, but not all, two-syllable words in English have first-syllable primary stress. Examine List 9 for two-syllable words with second-syllable primary stress.

CD #1
Track 10

List 9: Bisyllabic words; second-syllable stress

remove	control	serene	carafe	pertain	repulse
arranged	remain	caffeine	repute	suppose	untrue
perspire	beside	react	Brazil	invoke	humane
manure	discrete	compress (verb)	admire	assist	beguile

CD #1
Track 11

List 10: Three-syllable words; first-syllable stress

realize	horrible	circulate	fidgety	element	hypnotize
hydrogen	insulin	character	mediate	critical	Michigan
premium	rivalry	sacrifice	tolerant	verbalize	readable
yesterday	xylophone	mystify	glorious	caraway	terrible

CD #1
Track 12

List 11: Three-syllable words; second-syllable stress

Missouri	insipid	metallic	Ohio	betrayal	inscription
confusion	diploma	abortion	courageous	erosion	contagious
awareness	preparing	computer	neurotic	palatial	morphemic
repulsive	reminded	semantics	charisma	aroma	transistor

CD #1
Track 13

List 12: Three-syllable words; third-syllable stress

interrupt	indiscreet	Illinois	prearrange	disrespect	contradict
minuet	intervene	buccaneer	decompose	interfere	masquerade
reprehend	obsolete	readjust	disinfect	reapply	connoisseur
reimburse	introduce	predispose	disenchant	represent	nondescript

Note: It is possible to pronounce most of the words in List 12 with stress on the *first* syllable, depending on your own speaking habit and dialect. In addition, the location of stress in a multisyllabic word may change, depending on the message the speaker wishes to convey.

CD #1
Track 14

EXERCISE 2.18

Circle the words that have *second*-syllable stress.

decoy	mirage	pastel	puzzle	regret	platoon
stipend	thesis	undo	reason	falter	Maureen
timid	planted	derail	virtue	restricts	peon
transcend	parade	circus	suspend	movie	shoulder
lucid	cajole	devoid	cassette	provide	merchant

CD #1
Track 15

EXERCISE 2.19

Circle the three-syllable words that have *first*-syllable stress.

pondering	edited	consequent	misery	calendar	ebony
plentiful	asterisk	pharyngeal	persona	distinctive	example
surrounded	December	caribou	underling	Barbados	lasagna
terrified	hydrangea	telephoned	contended	perfected	India
musical	skeletal	courageous	umbrella	Philistine	perusal

CD #1
Track 16

EXERCISE 2.20

Circle the three-syllable words that have *second*-syllable stress.

stupendous	pliable	creative	carefully	elevate	magical
corporal	answering	spectacle	presumption	placenta	bananas
plantation	clarinet	murderer	predisposed	decorum	horribly
heroic	violin	integer	discover	clavicle	majestic
daffodil	subscription	expertise	immoral	muscular	Hawaii

Complete Assignment 2-2.

Broad Versus Narrow Transcription

Throughout the book, we will be referring to different forms of phonetic transcription. Therefore, it is important to say a brief word regarding these different forms of transcription now. Transcription of speech, making no attempt at transcribing allophonic variation, is called **broad transcription** or **phonemic transcription**. Virgules (slash marks) always are used with phonemic transcription. An example of broad transcription would be transcribing the word "ball" as /bɑl/. The final /l/ is a *dark* /l/. However, broad transcription does not make that distinction since the intent of phonemic (broad) transcription is to capture on paper the transcription of phonemes, with no reference to allophonic variation.

Narrow transcription or **allophonic transcription**, on the other hand, relies on diacritics to show modifications in the production of a vowel or consonant phoneme during transcription. Allophonic transcription of the word "ball" with a velarized or *dark* /l/ would be [bɑɬ]. Notice that brackets, not virgules, are used with narrow transcription. Narrow transcription also would allow for differentiation between the released (exploded) /p/ and the unreleased /p/ in production of the words "keep" [kip] and [kip˺], respectively.

There are times when transcription of an *unknown* sound system may be necessary. Suppose you were asked to analyze the phonological system of someone who spoke a language with which you were not familiar. You would need to listen very carefully and would need to put down on paper every phonemic and allophonic detail associated with that person's speech production. Every detail would be important, because you would be interested in trying to understand the rules that explain how the speech sound system is structured. This type of transcription, where nothing is known about a particular speech sound system prior to analysis, is termed an **impressionistic transcription**, another form of narrow transcription. Impressionistic transcription also may be employed when working with a child who has a severe speech sound disorder affecting the rules associated with typical speech development. Brackets always are used when performing an impressionistic transcription.

EXERCISE 2.21

Match the terms that can be associated with *phonemic*, *allophonic*, or *impressionistic* transcription. There will be more than one correct answer for each term.

_____ phonemic
_____ allophonic
_____ impressionistic

1. broad transcription
2. narrow transcription
3. use of virgules
4. use of brackets

Review Exercises

A. How many phonemes are there in each of the following words? Circle the words that have the same number of phonemes as letters.

1. bread _____
2. coughs _____
3. throw _____
4. news _____
5. plot _____
6. stroke _____
7. fluid _____
8. spew _____
9. fat _____
10. tomb _____
11. walked _____
12. last _____

B. How many morphemes are there in the following words?

1. clueless _____
2. tomato _____
3. pumpkin _____
4. likable _____
5. cheddar _____
6. rewrite _____
7. winterized _____
8. edits _____
9. thoughtlessness _____
10. coexisting _____

C. Listed below are three columns of words. Decide if the words in columns 2 or 3 *end* in the same phoneme as the words in the first column. Circle the correct matches.

1.	box	flack	puss
2.	buzz	dogs	fits
3.	flag	lounge	league
4.	cooked	pant	nagged
5.	throw	cow	beau
6.	through	chow	flew
7.	tomb	limb	bob
8.	fleas	wheeze	mice
9.	laugh	giraffe	bough
10.	path	bathe	cloth

D. When the sounds in the words below are reversed, they make another word. What is the new word in each case, after reversing the sounds?

1. net _____
2. sell _____
3. pots _____
4. gnat _____
5. need _____
6. main _____
7. pin _____
8. ban _____
9. tack _____
10. tune _____

E. For the following set of items, circle the one that *begins* with a sound *different* from the other two.

1.	church	chef	chop
2.	see	cent	cut
3.	think	this	these
4.	knee	came	nut
5.	phone	please	frost
6.	song	sure	sheep
7.	gnaw	geese	ghost
8.	cup	choir	chore
9.	gerbil	goat	George
10.	their	thanks	thing

F. Give a minimal pair for each of the following words by changing the underlined phoneme.

1. s<u>p</u>it _____
2. <u>h</u>and _____
3. <u>p</u>ink _____
4. <u>s</u>in _____
5. pai<u>l</u> _____
6. f<u>a</u>n _____
7. <u>th</u>ought _____
8. h<u>a</u>d _____
9. <u>t</u>ook _____
10. r<u>o</u>b _____

G. Circle the following pairs of words that are *minimal pairs*.

1. maybe, baby
2. plaid, prod
3. looks, lacks
4. mail, mailed
5. prance, prince
6. bribe, tribe
7. smart, dart
8. shout, pout
9. window, minnow
10. lumpy, bumpy

H. For the underlined syllables, indicate whether they are open (O) or closed (C).

1. mar<u>ble</u> _____
2. <u>pre</u>vious _____
3. pa<u>tron</u> _____
4. <u>tri</u>fle _____
5. <u>so</u>dium _____
6. <u>awe</u>some _____
7. mis<u>take</u> _____
8. luck<u>y</u> _____
9. prof<u>it</u> _____
10. <u>sy</u>stem _____

I. Examine the following words. Indicate whether the *first* syllable has an *onset* and/or a *coda* by placing an "X" in the appropriate column.

	Onset		***Coda***	
Examples:	***Yes***	***No***	***Yes***	***No***
social	X			X
picture	X		X	
1. mentions				
2. icon				
3. camper				
4. instinct				
5. able				
6. lotion				
7. charming				
8. asterisk				
9. Japan				
10. aloof				

J. Indicate the primary stress for each of the following two-syllable words. Write "1" if the first syllable has primary stress or "2" if the second syllable has primary stress.

CD #1
Track 17

_____ 1. loser	_____ 6. provoke	_____ 11. plastic
_____ 2. unsure	_____ 7. stagnant	_____ 12. divorce
_____ 3. anxious	_____ 8. beside	_____ 13. western
_____ 4. disturb	_____ 9. germane	_____ 14. language
_____ 5. Grecian	_____ 10. gourmet	_____ 15. defer

K. Indicate the primary stress for each of the following three-syllable items. Write "1", "2," or "3" to indicate the syllable with primary stress.

CD #1
Track 18

_____ 1. provincial	_____ 6. hypocrite	_____ 11. picturesque
_____ 2. sorceress	_____ 7. indisposed	_____ 12. relegate
_____ 3. indigent	_____ 8. uncertain	_____ 13. foundation
_____ 4. commander	_____ 9. magenta	_____ 14. contagious
_____ 5. arabesque	_____ 10. platypus	_____ 15. constable

L. Indicate the primary stress for each of the following four-syllable words. Write "1," "2," or "3," or "4" to indicate the syllable with primary stress.

CD #1
Track 19

_____ 1. problematic	_____ 6. correlation	_____ 11. protozoan
_____ 2. mercenary	_____ 7. catamaran	_____ 12. contradiction
_____ 3. statistical	_____ 8. continuant	_____ 13. protoplasm
_____ 4. ecosystem	_____ 9. allegory	_____ 14. Argentina
_____ 5. gregarious	_____ 10. carnivorous	_____ 15. obstructionist

Study Questions

1. What is a phonetic alphabet?
2. What is the difference between a *digraph* and an *allograph*?
3. Discuss three ways in which English spelling principles deviate from the ways words are pronounced.
4. Define the following terms:
   a. *morpheme*
   b. *phoneme*
   c. *grapheme*
5. Why are *allophones* not considered to be *phonemes*?
6. Contrast the terms *complementary distribution* and *free variation*.
7. What is the purpose of the IPA?
8. Why is the term *syllable* difficult to define?
9. Define the following terms: *onset, rhyme, coda, nucleus*.
10. What is the difference between an *open* and a *closed* syllable?
11. Why are the words "spread" and "bread" not *minimal pairs*?
12. What is the difference between *phonemic* (broad), *allophonic* (narrow), and *impressionistic* transcription?

Online Resources

International Phonetics Association home page. (n.d.). Retrieved from *http://www.langsci.ucl.ac.uk/ipa/*
(numerous resources including charts, sounds, and fonts)

SIL International. (2014). *IPA help*. Retrieved from *http://www.sil.org/computing/ipahelp/index.htm*
(downloadable computer program for learning sounds of the IPA)

UCLA Phonetics Lab archive. (2009). Retrieved from *http://archive.phonetics.ucla.edu/*
(provides information and audio recordings regarding the sounds of the world's languages)

UCLA Phonetics Lab data web page. (n.d.). Retrieved from *http://www.phonetics.ucla.edu/*
(provides recorded samples of the sounds of the world's languages)

University of Victoria Department of Linguistics, Linguistics IPA Lab. (n.d.). *Public IPA chart*. Retrieved from *http://web.uvic.ca/ling/resources/ipa/charts/IPAlab/IPAlab.htm*
(interactive IPA chart with pronunciations of all IPA symbols)

Assignment 2-1

Name _____

1. Indicate the number of phonemes in the following words.

a. _____ queen	e. _____ treats	i. _____ window
b. _____ Christine	f. _____ rough	j. _____ Toledo
c. _____ thought	g. _____ diskette	k. _____ received
d. _____ ripped	h. _____ extra	l. _____ sprints

2. Indicate the number of morphemes in the following words.

a. _____ lasting	e. _____ paper	i. _____ currently
b. _____ wonders	f. _____ speedy	j. _____ unchanging
c. _____ ideas	g. _____ monkeys	k. _____ cantaloupe
d. _____ misplaced	h. _____ devalue	l. _____ reapplied

3. For the following set of items, circle the words that *begin* with a sound different from the other two.

a. train	think	Thomas
b. Janet	genie	gaunt
c. them	Theo	that
d. capture	chaos	chowder
e. fathom	phone	push
f. chasm	king	chastity
g. knot	gnu	guru
h. genre	judge	gym
i. chance	chortle	chord
j. sail	candy	centipede

4. For the following set of items, circle the words that *end* with a sound different from the other two.

a. wreath	breathe	breath
b. coop	coup	flew
c. keys	gnats	wheeze
d. catch	splash	mesh
e. blue	flow	chew
f. rapt	rad	caulked
g. was	floss	causes
h. tract	trapped	trailed
i. wax	laws	wicks
j. below	brow	crow

Assignment 2-2

Name _____

1. Give a minimal pair for each of the following words by changing the underlined phonemes.

a. <u>b</u>ind	_____	f. w<u>i</u>n	_____
b. lea<u>n</u>	_____	g. pa<u>th</u>	_____
c. r<u>e</u>d	_____	h. <u>j</u>ob	_____
d. wi<u>sh</u>	_____	i. <u>t</u>rash	_____
e. l<u>oo</u>k	_____	j. f<u>oa</u>m	_____

2. Circle the following pairs of words that are *not* minimal pairs.

a. one, sun	f. respire, perspire
b. clasp, grasp	g. large, charge
c. learn, turn	h. feud, rude
d. slice, nice	i. thrash, crash
e. spite, spot	j. gerbil, journal

3. For the underlined syllables, indicate whether they are open (O) or closed (C).

a. grue<u>some</u>	_____	f. con<u>spire</u>	_____
b. laz<u>y</u>	_____	g. set<u>tee</u>	_____
c. <u>pre</u>dict	_____	h. <u>sev</u>eral	_____
d. con<u>fuse</u>	_____	i. suit<u>a</u>ble	_____
e. <u>suc</u>cess	_____	j. <u>thy</u>roid	_____

4. Indicate (with an "X") the words that have an onset in the *second* syllable.

a. concern	_____	f. preempt	_____
b. inaugurate	_____	g. request	_____
c. gigantic	_____	h. earring	_____
d. bulkhead	_____	i. barley	_____
e. cocoa	_____	j. coaxial	_____

5. Examine the following words. Indicate whether the *first* syllable has an onset and/or a coda by placing an "X" in the appropriate column.

	Onset		***Coda***	
Examples:	**Yes**	**No**	**Yes**	**No**
social	X	_____	_____	X
picture	X	_____	X	_____
a. sandbag	_____	_____	_____	_____
b. deactivate	_____	_____	_____	_____

Assignment 2-2 (cont.)

	Onset		*Coda*	
	Yes	**No**	**Yes**	**No**
c. auspicious	_____	_____	_____	_____
d. enunciate	_____	_____	_____	_____
e. sycamore	_____	_____	_____	_____
f. toxic	_____	_____	_____	_____
g. reflective	_____	_____	_____	_____
h. overtly	_____	_____	_____	_____
i. encapsule	_____	_____	_____	_____
j. fusion	_____	_____	_____	_____

6. Indicate the primary stress for each of the following multisyllable words. Write "1," "2," or "3" to indicate the syllable with primary stress.

_____ a. intestinal	_____ f. devaluated	_____ k. unaccompanied
_____ b. demarcation	_____ g. maniacal	_____ l. orthodontist
_____ c. statuary	_____ h. sociology	_____ m. trigonometric
_____ d. monetary	_____ i. coriander	_____ n. confederation
_____ e. superfluous	_____ j. elasticity	_____ o. begrudgingly

7. For each of the following, indicate whether the underlined letters represent the onset (O), the nucleus (N), or the coda (C). Write O, N, or C in the blank.

a. <u>o</u>vert	_____	f. h<u>a</u>ndsome	_____
b. <u>r</u>evered	_____	g. seanc<u>e</u>	_____
c. spirit<u>s</u>	_____	h. <u>gr</u>asped	_____
d. wh<u>y</u>	_____	i. con<u>f</u>ined	_____
e. le<u>dg</u>er	_____	j. st<u>o</u>ic	_____

8. On a separate piece of paper, draw tree diagrams of the syllable structure for the following words.
   a. own
   b. crust
   c. lonely
   d. undo