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THE ENGLISH SYLLABLE: BIG NEWS, BAD NEWS, AND ITS IMPORTANCE FOR INTELLIGIBILITY

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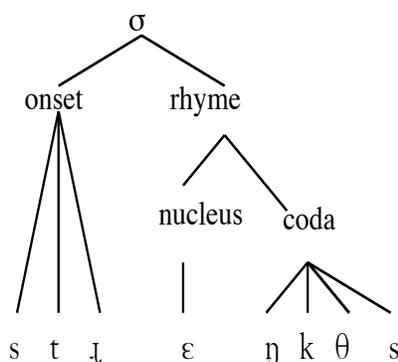
Addressing bi-directional intelligibility challenges: From the humble syllable to the pragmatic functions of English prosody

The negative impact of non-native prosody on speaker intelligibility has been documented both when segmental accuracy is intact (Derwing & Rossiter, 2002) and when it is compromised (Zielinski, 2008).

The challenge for L2 learners when interpreting native-speaker prosody has also been documented (Vandergrift & Goh, 2012) by learners who report, “understanding the words but not the message” (p. 22). This paper seeks to address instructor and learner metacognition regarding the role of the English syllable at the lexical, phrasal, sentential and discourse levels. It includes monosyllabic native-language/ target-language syllable-structure comparison. It addresses the spoken form category of Nation's (2001) requirements for knowing a word by adopting the Murphy and Kandil (2004) numeric notation system for lexical stress. It expands the scope of this system to the phrasal and sentence levels. Finally, it establishes a springboard for recognizing contrastive stress and intonation and their role in conveying speaker intent.

Bad news

Of 486 languages recently surveyed, English is reported in *The World Atlas of Language Structures* to be among the roughly 30% classified as having a complex syllable structure (Maddieson, 2013). The complexity of the English syllable, which allows onsets of up to three consonants phonemically and codas of up to four consonants phonetically in monosyllabic words – for example, *strengths*, diagramed below – poses challenges to learners from simple or moderate syllable structure languages.



Challenges that the complexity of the English syllable poses are met one of two possible ways: 1) final consonant deletion or consonant cluster reduction, eliminating some or all coda consonants, or 2) epenthesis, inserting vowels to restore a C-V syllable structure. These phonological processes seem to be used unconsciously as learners seek to conform to their L1 syllable structure. Both solutions adversely impact intelligibility, either singly or in combination with morpho-syntactic errors:

Thai speech sample:	sounds like
You like white rice?	You lie why rye?
CV CVC CVC CVC	CV CV CV CV

Chinese¹ speech sample, spoken by a tailor to a customer seeking to get pants hemmed:

One in(ch) or two in(ches) ?
 CVC VC VC CV VC

Japanese speech samples:

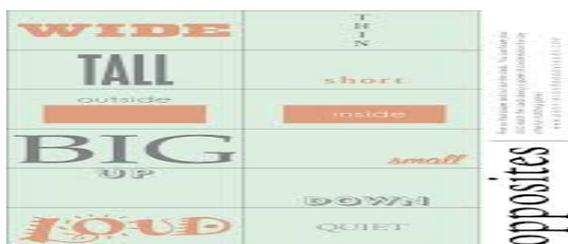
gift shop	gifuto shoppu ²
CVCC CVC	CVCVCV CVCV
hot dog	hoto dogu
CVC CVC	CVCV CVCV



Teaching tips

Take advantage of target sounds/ clusters that exist in the L1. The problem is not always with the articulators; target sounds may exist in the L1 but not in all possible word positions or phonological environments. Examples: Thai has unvoiced alveolar fricative /s/ word initially (sà-wàt-dee), but not word finally; Spanish allows clusters with fricative /s/ + stops word-internally (“transcriber”), but not word-initially (“escribir”); unvoiced bilabial stop /p/ occurs in Arabic as an allophone [p] of /b/ before unvoiced consonants. Bypass orthographic mapping, word position, and other L1 constraints. Migrate permissible articulations to new word positions and phonological environments.

Start contrastive stress instruction early. Introduce marked, contrastive stress with monosyllabic words, for example in lessons on antonyms. Anticipate push-back; students may resist exaggerated prosodic contours of the target language. Assuming that speech production facilitates speech perception in an auditory feedback loop (Reed & Michaud, 2012), encourage students to practice producing contrastive stress in class in order to hear it when used by others outside of class.



I don't want a *small* one, I want a _____ one.
 Don't turn the volume *up*, turn it _____.
 your turn: _____.

Important news & more bad news

Moving on from monosyllabic words, lexical stress poses a second challenge, establishing the syllable as the relevant and meaningful unit of timing for English, the duration of the vowel in the stressed

¹ Chinese and Japanese allow CVn syllables, e.g., Japanese *San* for “Mr./ Mrs./ Ms.”; Chinese [kwaŋ] for “light”

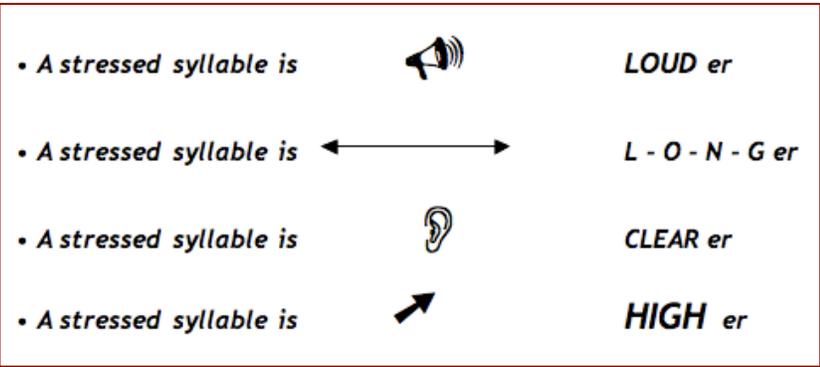
² Gift Shop at Golden Gate Park, San Francisco. Photo courtesy of J. Gilbert

syllable as essential for intelligibility, and the alternation of stressed and unstressed syllables as the foundation for English prosody. The important news is that stress alternates in most disyllabic and polysyllabic words³ (see Cutler, 1986). The bad news is that lexical stress patterns are not easily predictable, as confirmed by the identification of 39 stress patterns in an analysis of 2979 polysyllabic words in Coxhead’s (2000) Academic Word List (Murphy & Kandil, 2004). Lexical stress in disyllabic words: In English, stress patterns alternate.

trochaic: STRONG weak	iambic: weak STRONG
 differ ego awkward person	 defer ago occurred percent

The phonetic realization of stressed syllables includes dynamic cues, melodic cues, and vowel quality changes (Sluijter & Van Heuven, 1996).

Perceptually, the salient characteristic of stressed syllables is prominence (Roach, 2009), the recognizable features of which include the following:



Challenges

In English, lexical stress patterns in most polysyllabic words are unpredictable.

Three 3-syllable words;
 Three different stress

- | | |
|---------------------|---------|
| Wind Instrument | piccolo |
| Keyboard Instrument | piano |
| String Instrument: | violin |



We know that word stress is important for spoken word recognition (Cutler, Dahan, & van Donselaar, 1997), as illustrated below:

³ Exceptions: compounds (*sidewalk*) and polysyllabic words with full vowels (e.g., *halo*, *window*, *typhoon*, *hotel*)

Linguistics Conference Discussant: “I’m here to discuss the [wa ka .byu la riz].”
vocabulary

Workplace Training Session: “The # 1 priority is control of the [In .wen to ri].”
inventory

Call Center Customer Service Rep: “To activate your cell phone, push a row.”
the arrow

We also know that for L2 learners of English, word stress is often reported to be difficult to acquire (Archibald, 1993, 1997; Guion, 2005; Guion, et al., 2004; Pater, 1997; Wayland et al., 2006). The degree of predictability in the L1 plays a role in cognitive attention to word stress; learners from fixed-stress languages never have to think about word stress.

1st Syllable: Czech, Finnish, Icelandic, Hungarian
 Penultimate Syllable: Quechua, Polish
 Antepenult Syllable: Macedonian
 Word-final Syllable ‘prosodic stress’: French

According to Peperkamp, Vendelin, & Dupoux (2010), if word stress is predictable, learners do not encode it in their lexical representations in their L1, nor, crucially, when learning an L2.

Teaching tips

In variable-stress languages, such as English, the number of possible stress patterns is unwieldy. As a manageable alternative to teaching a large number of rules, provide tools.

Stress Pattern Notation System*

Two numbers:

The first number indicates the number of syllables

The second number indicates where the primary stress falls.

3-1	3-2	3-3
piccolo	piano	violin

*adapted from Murphy, J., Kandil, M. (2004). Word-Level Stress Patterns in the Academic Word List. *System*, 32, 61-74.

Alternatively, you may wish to adopt a Stressed Syllable/Number of Syllables system, rendering the above: piccolo – 1/3 (1st syllable stressed in a 3-syllable word), and so on.

A former student, schooled in the Murphy /Kandil notation system, added colored squares as a visual aid.



It is fine to let your students see you counting out the syllables on your fingers. Native Speakers have long forgotten how we acquired the stress patterns along with every multisyllabic word we know. Once this system is introduced, resist responding to, “How to say ___?” by saying the word. Rather, provide the stress pattern and let the students produce the word. They will retain it longer – and they love this system!

Screen shot of classroom set-up courtesy of M. Noble, ESOL Instructor, Salem, MA

Embed the stress-pattern notation system in a Vocabulary Checklist (Reed & Michaud, 2005, p. 154). Introduce it once; use it thereafter. It addresses the question, “What do your students need to know when they learn a new word?” in keeping with Nation’s list for receptive and productive skills (2001, p. 27).

Learning New Vocabulary

When you want to know the meaning of a word, you need to ask the question grammatically:

Asking someone what a word means: What does _____ mean?

Telling someone what a word means: It means _____.

Did you know?

When you learn a new word, you need to learn its Stress Pattern as well as its meaning.

New Word Stress Pattern

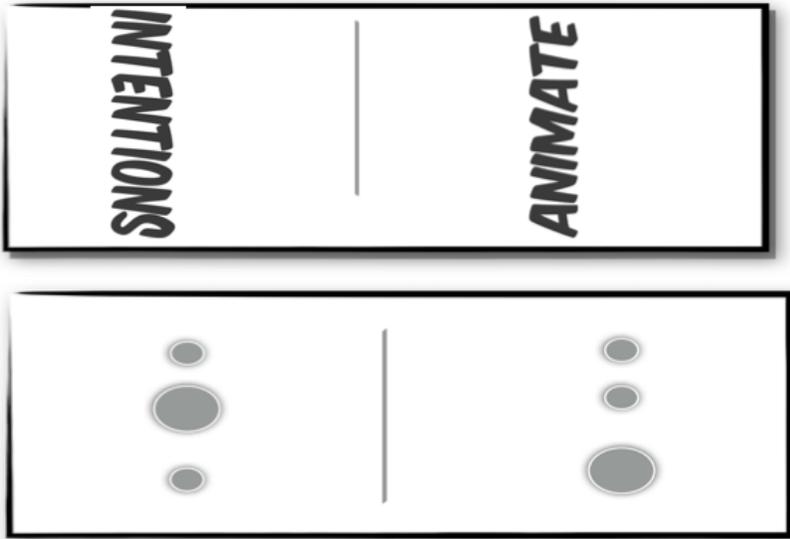
For example: *economy* is a 4.2 word (4 syllables, stress on the 2nd syllable)

economics is a 4.3 word (4 syllables, stress on the 3rd syllable)

Checklist for Learning New Vocabulary	
<p>1. How do you spell _____?</p> <p style="margin-left: 40px;">How do you spell it?</p> <p>2. What part of speech is it? _____</p> <p>For Nouns: Count Noun? <input type="checkbox"/> Non-Count Noun? <input type="checkbox"/></p> <p style="margin-left: 40px;"><i>Singular Count Noun: a/ an/ the</i></p> <p style="margin-left: 40px;"><i>Plural Count Noun: add 's'</i></p> <p>For Verbs: Transitive? <input type="checkbox"/> Intransitive? <input type="checkbox"/></p> <p>3. How do you pronounce it?</p> <p>How many syllables are there in the word? _____</p> <p>Which syllable gets the (primary) stress? _____</p> <p>New Word / Stress Pattern: _____ / _____</p> <p>4. How do you use it in a sentence?</p> <p>_____</p> <p>5. Alternate Forms:</p> <p>_____</p>	

Teaching Tips Dominoes

Provide Plentiful Practice Opportunities. Once the lexical stress notation system for multisyllabic words has been introduced, provide opportunities for students to practice at both metacognitive and oral skills levels. Create and use Word Dominoes to focus learners’ attention and promote practice with stress patterns in multisyllabic words. Include commonly mispronounced monosyllabic words (<speak> not [ɛspik]; <lunch> not [lʌntʃi]), and regular monosyllabic nouns and verbs with inflectional endings (-es; -ed), which students typically mispronounce as two syllables: (e.g., <fixed> [fiksɛd]).



Word Dominoes
 Inspired by Celce-Murcia, et al. (2010). *Teaching Pronunciation: A Course Book and Reference Guide*. Cambridge University Press.

Adapted from Hancock, M. (1995). *Pronunciation Games*. Cambridge University Press.

Big news

As noted by Cutler (1986), in English, “stress oppositions between verb and noun forms of the same stem {*decrease, conduct, import*} are common...” (p. 204). Exercises which highlight these oppositions, such as the one below adapted from Reed & Michaud (2005, p. 61), can be eye-opening for learners. This may be the first time learners notice and recognize a function of stress: Change the stress pattern; change the part of speech. At the metacognitive level, learners can make observations and generalizations about stress assignment: trochaic stress assignment to nouns; iambic to verbs. Teachers can optimize this ‘ah-hah’ moment and maintain a focus on normal and also contrastive stress.

		Stressed Syllable	Part of Speech
1.	a) What an insult!	1 st	Noun
	b) Don't insult me!	2 nd	Verb
2.	a) Round up the suspects.	1 st	Noun
	b) I think he suspects you.	2 nd	Verb
3.	a) Do I need a permit?	1 st	Noun
	b) We don't permit that.	2 nd	Verb

Teaching tips

When teaching derivational affixes, teach normal, predictable suffix stress patterns first.

trochees (STRONG weak)	+	-ation
Primary stress becomes secondary		
CAN cel	⇒	CANcell Ation
iambic (weak STRONG)	+	-ation
Primary stress bumps left; English does not allow back-to-back primary stress		
con FIRM	⇒	CONfirm Ation

Next teach derivational prefixes; these will add to the syllable count, but not affect primary stress assignment. Consider the following derived words and their roots:

3-2: immoral; dishonest; illegal; disloyal (derived from 2-1 roots)

3-3: immature; reinvent (derived from 2-2 roots)

5-3: unreliable (derived from a 4-2 root)

Sample sentence:

reliable (4-2) + prefix “un” ⇒ unreliable (5-3)

My boss is unreliable.

Now introduce contrastive stress:

unreliable (5-3) + Contrastive Stress ⇒ *unreliable* (5-1)

My boss used to be reliable, but lately she’s become *unreliable*.

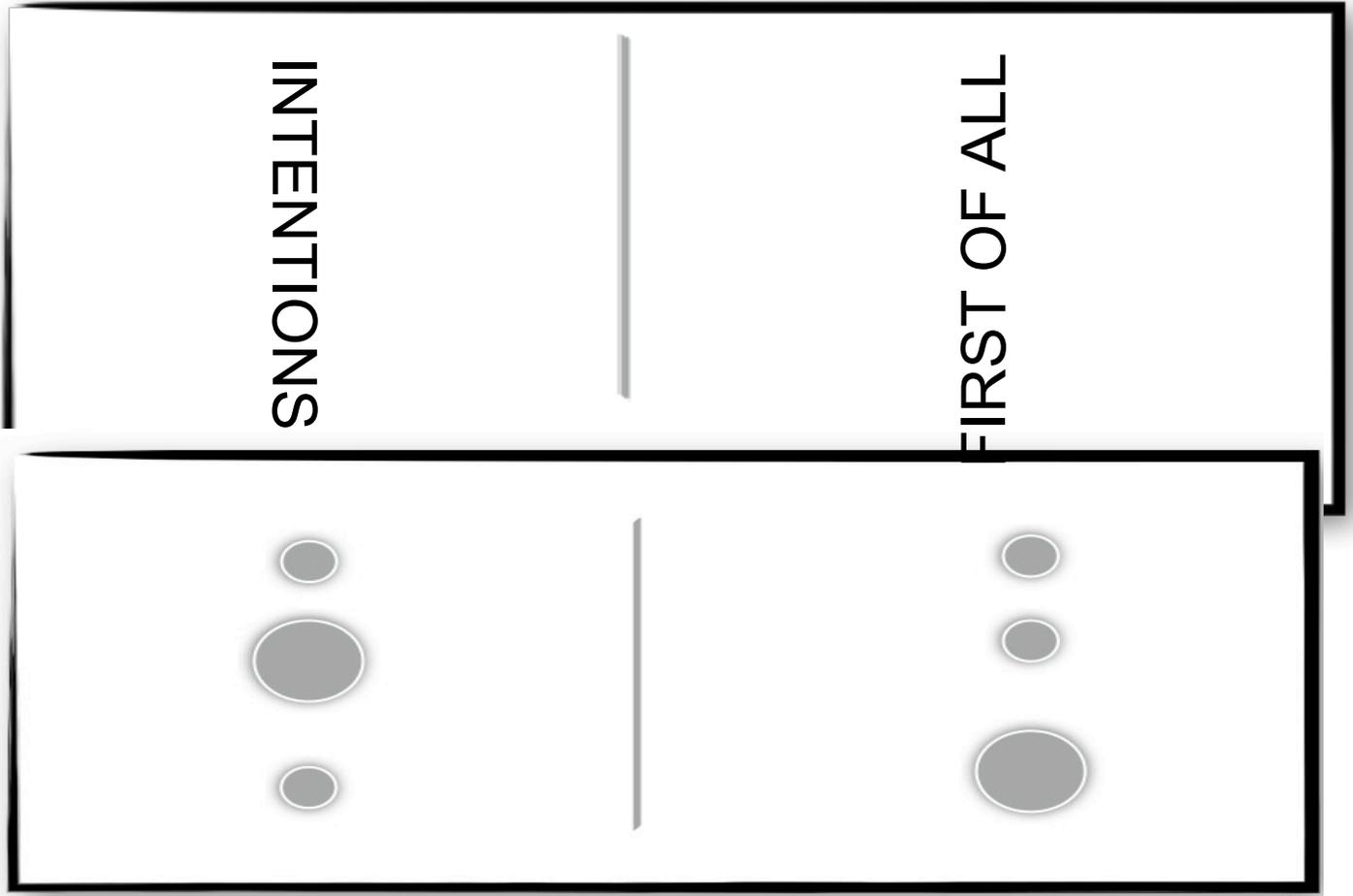
Challenges

Mastering the speech rhythm of English is reported to be difficult for learners (Wennerstrom, 2001). In addition to insufficient durational differences between stressed and unstressed syllables in words (Flege & Bohn, 1989), is the tendency not to reduce the duration of function words in sentences (Aoyama & Guion, 2007). The communication breakdowns that result can be at times humorous, as when the directive, “[θri tu faiv]” is intended as an indication of the hours of service [θri tə faiv], not the location or room number of the service (Grant, 2009, SUPRAS communication). While the temporal difference native speakers use to distinguish between “two” and “to” can be innocuous in one situation, the lack of durational differentiation between these homophones has proven to be fatal in aviation communication. This was the case in a 1989 crash reported by Cushing (1995), in which, as the clearance read back makes evident, the pilot understood the Air Traffic Controller (ATC) to be clearing him to descend to (preposition) “four zero zero” hundred feet. The aircraft crashed into a hillside at 437 feet, just before reaching the vector beacon, where the minimal descent height was, as the ATC intended to convey, 2400 feet.

ATC cleared the aircraft to descend “two four zero zero.” The pilot read back the clearance as, “OK. Four zero zero.” The aircraft then descended to 400 feet (122 meters) rather than what the controller had meant, which was 2,400 feet (732 meters). (Cushing, 1995, p. 3)

Teaching tips Dominoes

Provide Practice Opportunities for Phrasal Stress. Revive and Revise the Word Dominoes. Create Word Dominoes that include preposition phrases and phrases with fixed stress patterns. Such phrases pattern just like lexical items. Use them to expand learner metacognition to the phrase level, and to promote practice with normal stress patterns in both multisyllabic words and in phrases.



Be sure to include in your Word Dominoes lexical items with stress patterns to match the phrasal patterns, both prepositional phrases and fixed phrases.

Sample phrasal stress patterns:

Prepositional Phrases		Fixed Phrases		Sample Words
2-2	4-3			
at work	in the morning	In other words...	4-2	affordable
at home	at the office	In the first place...	4-3	disagreement
at school	on the table	In the meantime...	4-3	combination
on time	for the weekend	On the other hand...	5-3	understandable
for now	to the movies	As I was saying...	5-4	characteristic

Provide Practice Opportunities for Contrastive Phrasal Stress in marked utterances.

I said to pick me up *before* work, not *after* work.

Although I didn't arrive *on* time, I made it *in* time, since everyone else was late, too.

Elicit Student Tell Backs: Raise student metacognition of the functions of contrastive stress.

"We use Extra Stress on Function Words to show contrast."

Important news

Investigations of the stress patterns of non-native speakers at various levels of proficiency reveal relatively restricted pitch range and uniform stress; that is, all words stressed more or less equally regardless of lexical category ('content' versus 'function' words) or semantic weight (Wennerstrom, 2000; Tyler, Jeffries, & Davies, 1988). In her study of listeners' judgments on L2 accentedness and comprehensibility, Kang (2010) found that the low-proficiency International Teaching Assistants (ITAs) "placed stress on many function words or articles such as 'be', 'the', 'that', and 'this is' (p. 310) with the result that "the more stressed words ITAs produced, the more accented their speech sounded to undergraduate students" (p. 309).

Teaching tips

Introduce normal, unmarked sentence level stress with a minimalist matrix. Content words appear in base, citation form, minus inflectional morphology. Provide a Template Sentence to establish context and grammatical tense. Students generate sentences supplying obligatory function words and morphology. This matrix is versatile, providing opportunities for practice of Yes/No and WH-questions as well as practice with the normal sentence stress.

Sample Matrix, using the long-running Law & Order series, and accompanying directions:

defense attorney	defend	client
jury	reach	verdict
judge	sentence	criminal

Directions: Finish this sentence: In a typical trial, _____.

Example: In a typical trial, the defense attorney makes an opening argument.

Elicit Student Tell Backs: Extend metacognition from phrases to sentences.

"In normal sentences, content words are stressed; function words are unstressed."

Introduce marked, implicational sentence stress with passages containing italicized words. Native speakers recognize that words in italics must be read differently. In the absence of instruction, learners

of English may be unaware of the use of italics as a deliberate or conscious signaling device used by the author. Learners may also be unaware of the oral equivalent of the printed italics, accounting for their failure to produce implicational fall/rise intonation.

Sample Sentence. Kenyan author Ngugi (1986, p. 11), writing about the effect of colonization on his native language:

“English became more than a language: it was *the* language, and all the others had to bow before it.”

Extend instruction to marked, implicational stress in sentences with no equivalent use of italics in print. Create two sound files and present the sentences orally only:

(Sentence 1) The teacher didn't grade your papers.

(Sentence 2) The *teacher* didn't grade your papers.

Introduce the Implicational Stress Checklist: co-construct the language to justify learner responses.
Implicational Stress Checklist:

Do Sentences (1) and (2) sound The Same or **Different**

Explain your Choice: (e.g., “Sentence 2 was extra sing-songy/ used extra stress/...”)

Student Tell Backs for Aural Discrimination:

“The vowel in the stressed syllable in the focus word was longer, louder, higher, clearer.”

Extend the Implicational Stress Checklist: include the pragmatic function of implicational stress

Ask: “Have the papers been graded?” **YES NO**

Explain your Choice: (e.g., “Sentence 2 used extra stress on ‘teacher’ to signal an implication.”)

State the Implication: Someone else (not the teacher) graded the papers.

Extend the Implicational Stress Checklist: introduce Given & New versus contrastive information.

Given & New: use normal sentence intonation:

Yesterday we discussed X. Today we'll discuss Y.

Yesterday we discussed the creation of MySpace. Today we'll discuss the creation of FaceBook.

Contrastive information: use contrastive stress to signal contrasting elements

Yesterday we discussed something about X. Today we'll discuss something else about X.

Yesterday we discussed the creation of MySpace. Today we'll discuss the marketing of MySpace.

Assess Listening Skills and Metacognition. Create two sound files; present orally only:

(1) There are some high-tech companies that sell a wide variety of products.

(2) There are *some* high tech companies that sell a wide variety of products.

Implicational Stress Checklist:

Do Sentences (1) and (2) sound the Same or **Different**?

Explain your Choice: (e.g., “Sentence 2 used extra stress on function word “some” to signal an implication.”)

Assess metacognition of the pragmatic function of implicational stress

Ask: What will the speaker discuss next?

- (a) the wide variety of products
- (b) other high-tech companies



Choice (b) because the speaker used implicational stress on the function word “some”.



Summary

The prosody of English begins with the alternation of stressed and unstressed syllables in disyllabic and polysyllabic words. The complexity of the English syllable poses challenges. To complicate matters, learners may hear as “exaggerated” what are actually the normal stress alternations of English, they may harbor negative views about implementing these in their own speech, and they may fail to conceptually grasp the intentional uses of marked, contrastive or implicational stress patterns by native speakers. As noted by Paunović & Savić (2008),

“Students often do not have a clear idea of why exactly ‘the melody of speech’ should be important for communication, and therefore seem to lack the motivation to master it, while teachers do not seem to be theoretically or practically well-equipped to explain and illustrate its significance” (pp. 72-73).

These Teaching Tips are intended to facilitate successful acquisition of the prosody of English. The strategies and checklists are suggested in order to address metacognition and aural and oral skills. Target measurable learner outcomes include:

- monosyllabic words produced as monosyllables
- disyllabic and multisyllabic words produced with the correct primary stress
- aural detection and oral production of marked, contrastive or implicational stress

- metacognitive articulation of the pragmatic functions of marked, contrastive or implicational stress

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