Richards, M. (2016). Transforming any text into an individualized segmental exercise via RelateWorldwide's *Pronunciation Highlighter*. In J. Levis, H. Le, I. Lucic, E. Simpson, & S. Vo (Eds). *Proceedings of the 7th Pronunciation in Second Language Learning and Teaching Conference*, ISSN 2380-9566, Dallas, TX, October 2015 (pp. 160-167). Ames, IA: Iowa State University.

TRANSFORMING ANY TEXT INTO AN INDIVIDUALIZED SEGMENTAL EXERCISE VIA RELATEWORLDWIDE'S *PRONUNCIATION HIGHLIGHTER*

Monica Richards, Iowa State University

In many L2 English pronunciation classes, it is difficult for teachers to provide segmental instruction and practice adequate for enabling students to acquire consistently accurate pronunciation of all high-functional-load segmentals they find challenging (Munro & Derwing, 2006). In part, this is because students in ESL classes rarely all need instruction and practice for the same English segmentals (Swan & Smith, 2001). While freely available asynchronous segmental training online may seem a natural solution to this problem and while outstanding segmental instruction has been available online for some time, few substantive practice resources have been available until recently to help students make their pronunciation fluent and automatic. This paper introduces the author's new online Pronunciation Highlighter, a tool capable of transforming any text students find interesting (textbook dialogues, technical term lists, PowerPoint presentation outlines, etc.) into individualized segmental practice exercises. The paper also suggests ways students can capitalize on Pronunciation Highlighter output to build new and accurate segmental pronunciation habits.

INTRODUCTION

Segmentals (the individual consonant and vowel sounds of a language), and particularly high-functional-load[1] segmentals (Brown, 1988, 1991; Catford, 1987; King, 1967; Munro & Derwing, 2006), can make a difference in the intelligibility and comprehensibility[2] of spoken English to NNS and NS listeners (Jenkins, 2000; Munro & Derwing, 2006). Unfortunately, as Jenkins (2000) points out, "It is widely agreed that habit formation in language transfer figures more extensively at the

[1] Functional load is defined by King (1967) in relation to phonology as "a measure of the work which two phonemes (or a distinctive feature) do in keeping utterances apart" (p. 831). Brown (1988) indicates that two important means of measuring functional load are (1) the frequency of minimal pairs containing any two given phonemes and (2) the frequency of each phoneme individually in the target language. Munro and Derwing (2006) suggest an additional relevant factor may be a target phoneme's position in a particular word since research indicates that "word-initial errors are more important than errors in other positions" (p. 530).

[2] The terms "intelligibility" and "comprehensibility" are here used in their technical sense, following Munro and Derwing (2006), with the term "intelligibility" referring to the degree to which a listener *successfully* understands what a speaker says and the term "comprehensibility" referring to listeners' impression of how *easy* it is to understand what a speaker says.

phonological level than at either the syntactic or lexical levels. . . . The production of speech sounds is unlike that of lexis and syntax, since it does not involve passing messages through the brain, but rather the development of highly automatized motor skills and, consequently, over time, the formation of L1 speech habits which are not easily de-automatized in L2" (Jenkins, 2000, p. 112). That is, while English language learners may gain explicit knowledge of how English segmentals are articulated through interesting and memorable pronunciation pedagogy such as that instantiated in Marsha Chan's *Pronunciation Doctor* YouTube videos: (https://www.youtube.com/channel/UCmo0sgPqUCPDLcGhi-J_JEg), facilitating the interface of this explicit knowledge into students' implicit, everyday habits of speaking English remains challenging. This is particularly true for cases such as that in which two phones (e.g., /n/ and /l/) are allophonic in a learner's L1 (e.g., the Sichuan/Hunan dialects of Chinese), but in English are full phonemes that therefore appear inconsistently "sprinkled" across the learner's L2 English speech, producing — where the problem phones carry high functional load as /n/ and /l/ do in English — notoriously low-comprehensibility or even unintelligible L2 English speech that often proves difficult to modify (Jenkins, 2000; Richards, 2012).

Segmentals matter for L2 English learners' English *listening*

Jenkins (2000) suggests that in L1-allophone/L2-phoneme cases such as for /n/ and /l/ above "Although production would . . .prove difficult prior to extensive instruction, it would almost certainly precede perception. We cannot assume that because [nonbilingual English speakers] are able to produce sound contrasts, they can necessarily discriminate aurally between them; indeed, the opposite is not infrequently true" (Jenkins, 2000, pp. 33-34). Jenkins' statement reflects Ladefoged's (1967) claim that "acoustic differences cannot be readily perceived until the corresponding articulatory gestures have been learnt" (p. 167). That is, unless students learn first to *articulate* the difference between English segmentals, they are unlikely to acquire the *perceptual* ability to distinguish them.

Failure to distinguish English segmentals aurally not only results in learners' inability to differentiate pseudohomophones they hear (e.g., "glass" and "grass" for L1 Japanese listeners), but far more seriously, results in their continuing to face spurious activation of pseudoembedded words as they attempt processing the stream of speech, with the result that their word segmentation and word identification processes remain inefficient. Cutler (2012) dramatically illustrates the importance of this concern by examining the high-functional-load /r/ vs. /l/ distinction, indicating that "frequency-adjusted estimates [based on the CELEX English Lexicon]. . . suggest 49,508 spurious embeddings per million words due to misperceiving [l] as [r], and 69,923 per million words for misperception of [r] as [l]" (p. 322).

The degree to which learners are helped in combating these segmentally-grounded L2 English listening problems by increasing their *explicit* knowledge of how problem English segmentals are articulated *when this explicit knowledge has not yet been proceduralized* remains an open question for further research. In all probability, however, learning to *habitually* articulate in near-standard form at least high-functional-load segmentals is important not only for increasing L2 English learners' spoken English intelligibility and comprehensibility but also for improving their English listening ability.

Can current resources proceduralize near-standard English segmental pronunciations?

Ellis (2008) provides helpful definitions of the implicit and explicit knowledge constructs in cognitive linguistics, defining *implicit knowledge* as being "intuitive, procedural, systematically variable, automatic, and thus available for use in fluent, unplanned language use." In contrast, Ellis defines *explicit knowledge* as being "conscious, declarative, anomalous, and inconsistent (i.e. [explicit knowledge] takes the form of 'fuzzy' rules inconsistently applied) and [is] generally only accessible through controlled processing in planned language use" (p. 418). While there is disagreement regarding whether or not implicit linguistic knowledge can be acquired post-puberty (Ellis, 2008) and whether the implicit/explicit knowledge distinction represents a continuum or dichotomy (Dienes and Perner, 1999), certainly it *is* important that learners be helped to proceduralize/automatize as much as possible near-standard articulation of high-functional-load segmental contrasts.

Many researchers (and, by definition, arguably all pronunciation *teachers*!) subscribe to a model of instructed L2 acquisition assuming the potential of at least weak interface between learners' explicit and implicit knowledge that allows the conversion of explicit knowledge to implicit knowledge at some point and to some degree (Ellis, 2008) — usually by means of practice. Unfortunately, a cursory review of pronunciation textbooks and software suggests that current offerings fail to provide learners with the quantity of practice likely necessary to assist the proceduralization process. It is to fill this gap that I have developed my Web-based *Pronunciation Highlighter*. This tool not only enables materials development for providing learners the varying amounts of practice likely to help proceduralize their standard/near-standard articulation of any given English segmental, but also allows learners freedom to choose the *content* that they input, with the goal of maximizing their interest in practicing their specific problem segmentals.

Overviewing RelateWorldwide's *Pronunciation Highlighter*

The *Pronunciation Highlighter* introduced above is available on the author's RelateWorldwide (**Re**sources for the **l**earning **a**nd **t**eaching of **E**nglish worldwide) website at http://www.relateworldwide.org/speaking/pronunciation-highlighter/. The *Pronunciation Highlighter* allows a student or teacher to input any text (Figure 1), indicate problem phonemes the *Highlighter* should identify and adjust the tool's default highlighter colors as desired. The design of the *Pronunciation Highlighter* is informed by pronunciation research findings in that its phoneme-selection component informs users of phonemes' high- and low-functional-load status (Brown, 1988, 1991; Catford, 1987; King, 1967; Munro & Derwing, 2006) by marking them either (+) or (-) respectively, thereby encouraging users to prioritize phonemes carrying high functional load and de-emphasize those carrying low functional load. When the user clicks "Submit," the *Highlighter* outputs his or her text with all words containing problem phonemes (according to version 0.2 of the freely available, redistributable *Illinois Speech and Language Engineering Dictionary* containing

Figure 1. RelateWorldwide's *Pronunciation Highlighter* input box for user-chosen input texts

137,000 words — Hasegawa-Johnson, 2007[3]) highlighted in the colors chosen. Words containing multiple problem phonemes are highlighted in yet another color — gray by default — to inform the user that these words are likely to need particularly careful attention and practice. Below the highlighted version of the user's input text, the *Pronunciation Highlighter* displays a list of all words in the text containing the user's problem phonemes (Figure 2). Each listed word is

[3] Because RelateWorldwide's *Pronunciation Highlighter* currently utilizes only the *Illinois Speech and Language Engineering Dictionary* (which is 90% based on [Hasegawa-Johnson, 2007] the *Carnegie Mellon University Pronouncing Dictionary,* "an open-source machine-readable pronunciation dictionary for North American English" — Lenzo, n.d.), its pronunciation highlighting currently reflects only North American English pronunciation norms.

hyperlinked to its YOUGLISH YouTube video "playlist," where each video in the "playlist" is cued to just a few seconds before the target word is spoken.[4]

Learning and teaching with RelateWorldwide's *Pronunciation Highlighter*

While RelateWorldwide's *Pronunciation Highlighter* has potentially several research and teaching applications, I highlight a few possibilities below to hopefully serve as fodder for creative pronunciation researchers, English language teachers and English pronunciation students to develop additional innovative ways of applying the *Pronunciation Highlighter* to maximize the ease with which English language learners can practice — with the aim of proceduralizing — standard/near-standard articulation of particularly high-functional-load English segmentals.

Inputting textbook conversation transcripts. Perhaps the most obvious application of the *Pronunciation Highlighter* is for teachers and students to input into the *Highlighter* the ubiquitous dialogues found in English as an international language (EIL) and ESL listening, speaking and pronunciation textbooks[5] and then to select first for practice challenging high-functional-load, and later, if desired, low-functional-load segmentals (Brown, 1988, 1991; Catford, 1987; King, 1967; Munro & Derwing, 2006).[6] Due to limits in language learners' attention/working memory resources (Ellis, 2008), it is probably advisable in most cases that 1) fewer than the *Pronunciation Highlighter*'s maximum of five problem segmentals be selected and 2) students first work on articulating their problem segmentals in the context of each segmental's output word list and only after that in the context of the *Pronunciation Highlighter*'s highlighted version of their original input text.

[4] YOUGLISH is a resource for unscripted, contextualized stream-of-speech intensive English listening/pronunciation practice hyperlinking 300,000+ English word and name spellings to a playlist of their appearances in what are apparently — based on closed-captioning quality — human-transcribed YouTube videos: http://youglish.com/. In addition to its default "all [dialects]" display option, YOUGLISH allows search results to be limited to the — almost certainly loosely defined — "US" and "UK" dialect families. YOUGLISH also allows phrase searches.)

[5] Ideally, most dialogues, etc., input into the *Pronunciation Highlighter* should instantiate formulaic speech routines characteristic of informal (everyday) or formal (academic and professional) English communication. If , as sometimes happens, textbook examples fail to instantiate functional language patterns and phraseology characteristic of standard English as it is really spoken in EIL/ESL contexts (Folse, 2004), students may be at risk of automatizing comprehensibility-detracting nonstandard phrasing and grammar. Example supplemental resources that *do* generally instantiate standard formulaic speech routines, phrasing and grammar (Derewianka, 1990, 2011; Folse, 2004; Francis, Hunston & Manning, 1996, 1998; O'Keeffe, McCarthy & Carter, 2007) include http://openlanguage.com/library/learn-english/10/complimentary-english-course/13 (for everyday communication) and https://www.ted.com/talks (for academic lecture/professional presentation communication).

[6] Particular learners' problem segmentals can best be identified through a diagnostic assessment of their ability both to *perceive* the various English segmentals (e.g., via a minimal-pair discrimination task) as well as to *produce* them (e.g., via reading aloud a standardized diagnostic passage containing most or all the segmentals/consonant clusters of English in the various syllable positions each can appear along with production of a free speech sample on some familiar topic) (Celce-Murcia, Brinton & Goodwin, 1996). Where individual diagnostic evaluations such as the above are not possible, a reference detailing the common English segmental errors characteristic of speakers from various L1s (e.g., Avery & Ehrlich, 1992; Kenworthy, 1987; Swan & Smith, 2001) can be used in conjunction with information on functional load (Brown, 1988, 1991; Catford, 1987; King, 1967; Munro & Derwing, 2006) to identify segmentals likely worthy of focus.

Inputting technical term lists. Mispronunciation of technical terms associated with one's academic discipline or profession can not only result in reduced intelligibility and comprehensibility, but also negatively impact listeners' impression of one's academic and professional competence. Proceduralizing near-standard pronunciation of the technical terms in one's field, therefore, should be a top priority of all learners of L2 English for academic or professional purposes.

Inputting formal presentations' "slide" text. In many contexts, we cannot predict what words we will need to say. However, in the often high-stakes context of formal presentations, one's PowerPoint or other presentation "slides" frequently contain most of the key vocabulary needed to present one's topic. Practicing standard/near-standard pronunciation of each slide's text, therefore, followed by repeated, semi-spontaneous practice through one's entire "slide" presentation is likely to maximize the intelligibility and comprehensibility of L2 English speakers' presentations.

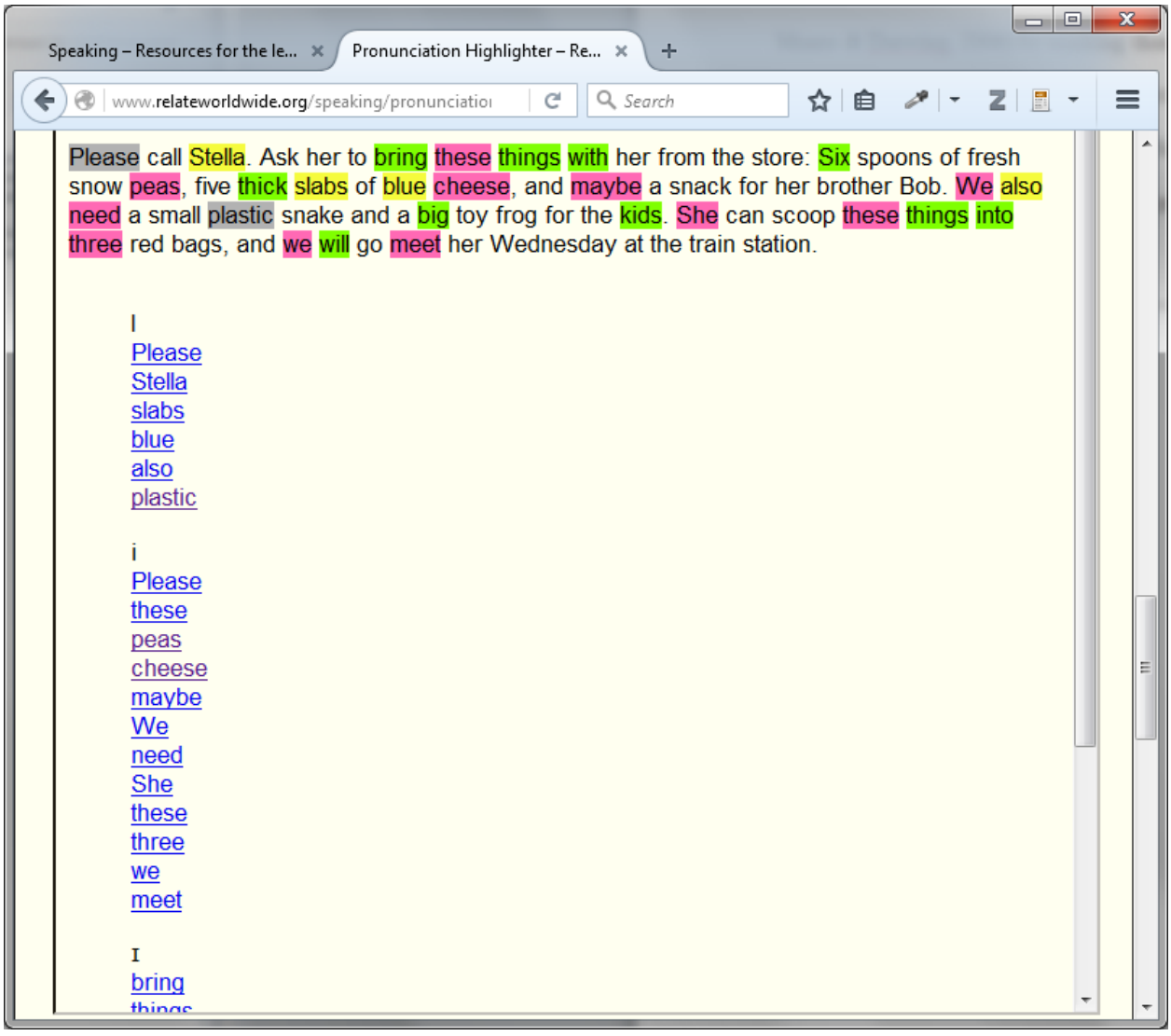

Figure 2. Example RelateWorldwide *Pronunciation Highlighter* output for a user-chosen input text

CONCLUSION

RelateWorldwide's *Pronunciation Highlighter* has been designed to enable L2 English learners and teachers to create high-interest materials in sufficient quantity that learners can engage in the practice required to proceduralize standard/near-standard articulation of English segmentals, particularly high-functional-load segmentals. RelateWorldwide's *Pronunciation Highlighter* can thus help L2 English learners reach their intelligibility and comprehensibility goals.

ABOUT THE AUTHOR

Monica Richards is a Ph.D. candidate in Applied Linguistics and Technology at Iowa State University. Her research interests focus on the intersection of psycholinguistics and English language listening and pronunciation, English-as-an-international-language pedagogy, and CALL (computer-assisted language-learning), especially among Chinese learners of English. **Contact information:** 443 Ross Hall, Iowa State University, Ames, IA 50011. 515-450-4169, monicagr@iastate.edu

REFERENCES

Avery, P., & Ehrlich, S. (1992). *Teaching American English pronunciation.* Oxford, UK: Oxford University Press.

Brown, A. (1988). Functional load and the teaching of pronunciation. *TESOL Quarterly, 22*, 593-606.

Brown, A. (1991). Functional load and the teaching of pronunciation. In A. Brown (Ed.), *Teaching English pronunciation: A book of readings* (pp. 211-224). London, UK: Routledge.

Catford, J.C. (1987). Phonetics and the teaching of pronunciation: A systemic description of English phonology. In J. Morley (Ed.), *Current perspectives on pronunciation: Practice anchored in theory* (pp. 86-99). Washington, DC: TESOL.

Celce-Murcia, M., Brinton, D. & Goodwin, J. (1996). *Teaching pronunciation: A reference for teachers of English to speakers of other languages.* Cambridge, UK: Cambridge University Press.

Cutler, A. (2012). *Native listening: Language experience and the recognition of spoken words*. Cambridge, MA: The MIT Press.

Derewianka, B. (1990). *Exploring how texts work.* Newtown, NSW, Australia: Primary English Teaching Association.

Derewianka, B. (2011). *A new grammar companion for teachers (2nd ed.).* Marrickville Metro, NSW: Primary English Teaching Association Australia.

Dienes, Z., & Perner, J. (1999). A theory of implicit and explicit knowledge. *Behavioral and Brain Sciences*, *22*(5), 735–808.

Ellis, R. (2008). *The study of second language acquisition (2nd ed.).* Oxford, UK: Oxford University Press.

Folse, K. (2004). *Vocabulary myths: Applying second language research to classroom teaching.* Ann Arbor, MI: The University of Michigan Press.

Francis, G., Hunston, S. & Manning, E. (Eds.) (1996). *Collins COBUILD grammar patterns 1: Verbs — Helping learners with* real *English.* London, UK: HarperCollins Publishers.

Francis, G., Hunston, S. & Manning, E. (Eds.) (1998). *Collins COBUILD grammar patterns 2: Nouns and adjectives — Helping learners with* real *English.* London, UK: HarperCollins Publishers.

Hasegawa-Johnson, M. (2007). Illinois Speech and Language Engineering Dictionary (ISLEdict) (Version 0.2) [Software]. Available from https://github.com/jart/poemy2/tree/master/data/isledict

Jenkins, J. (2000). *The phonology of English as an International Language: New models, new norms, new goals.* Oxford, UK: Oxford University Press.

Kenworthy, J. (1987). *Teaching English pronunciation*. New York, NY: Longman.

King, R.D. (1967). Functional load and sound change. *Language, 43,* 831–852.

Ladefoged, P. (1967). Three areas of experimental phonetics: Stress and respiratory activity, the nature of vowel quality, units in the perception and production of speech. Oxford, UK: Oxford University Press.

Lenzo, K. (n.d.) Carnegie Mellon University Pronouncing Dictionary (CMUdict) [Software]. Available from http://www.speech.cs.cmu.edu/cgi-bin/cmudict

Munro, M.J. & Derwing, T.M. (2006). The functional load principle in ESL pronunciation instruction: An exploratory study. *System*, *34*, 520-531.

O'Keeffe, A., McCarthy, M. & Carter R. (2007). *From corpus to classroom: Language use and language teaching*. Cambridge, UK: Cambridge University Press.

Richards, M. (2016). *Pronunciation highlighter (based on North American English)*. Retrieved from http://www.relateworldwide.org/speaking/pronunciation-highlighter/

Richards, M. (2012). Helping Chinese learners distinguish English /l/ and /n/. In. J. Levis & K. LeVelle (Eds.). Proceedings of the 3rd Pronunciation in Second Language Learning and Teaching Conference, Sept. 2011. (pp. 161-167). Ames, IA: Iowa State University.

Swan, M., & Smith, B. (2001). *Learner English: A teacher's guide to interference and other problems*. Cambridge, UK: Cambridge University Press.

Willis, D. (2003). *Rules, patterns and words: Grammar and lexis in English language teaching.* Cambridge, UK: Cambridge University Press.