

# BEYOND SEGMENTS

## *Prosody in SLA*

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22 Mastering the pronunciation of a second language (L2) is considered  
23 extremely difficult, and few individuals succeed in sounding like a native  
24 speaker when learning a L2 in adulthood (Bongaerts, Van Summeren,  
25 Planken, & Schils, 1997; Scovel, 2000). Successful L2 pronunciation  
26 involves not only learning how to authentically produce all the indi-  
27 vidual sounds of the target language but also the acquisition of the L2's  
28 unique prosody, such as its intonation, stress, rhythm, tone, and tempo.

30 Transfer from the first language (L1) is thought to be particularly  
31 persistent in prosody; L1 prosodic influences can remain present even  
32 after years of experience with the L2 (Mennen, 2004; Pickering, 2004).  
33 Research suggests that nontargetlike prosody in a L2 plays an important  
34 and independent role in the perception of foreign accentedness and in  
35 native-listener judgments of comprehensibility (Jilka, 2000; Magen, 1998;  
36 Munro, 1995; Trofimovich & Baker, 2006). Some research even suggests  
37 that prosody is more important than segments in such perceptions  
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41 The idea of putting together this special issue originated during a workshop on L2 prosody  
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(e.g., Anderson-Hsieh, Johnson, & Koehler, 1992; Boula de Mareüil & Vieru-Dimulescu, 2006; Carmichael, 2000; Magen, 1998). Despite this, and despite the fact that there is a large and growing body of research on prosody in mainstream phonetics and phonology, there has—until recently—been comparatively little investigation of prosody within SLA (Gut, 2009; Mennen, 2004; Piske, MacKay, & Flege, 2001). For example, a survey of major international journals in L2 acquisition between 1969 and 2008 (Gut, 2009) showed that of 133 empirical studies on L2 phonology, only 17 pertained to prosody.

Recent years have, however, seen a growing interest in the prosodic aspects of SLA, and attempts are now being made to develop new or to extend existing models to account for the prosodic aspects of speech learning in SLA. We therefore believe that the time is ripe for this special issue, which moves beyond the segmental level of speech to focus on prosody in SLA.

## WHAT IS PROSODY?

*It's not what you say; it's how you say it.* Everyone has heard these words, or perhaps even said them themselves. Most likely, if one attempted to explain exactly how the particular words in question were said, it would be difficult to do so. They may have been articulated quickly or slowly, with a high or low pitch, loudly or quietly, or with a combination of these characteristics. When trying to describe the manner in which something is said, one is, in most cases, attempting to describe the prosody of an individual's speech.

The term *prosody* has been defined in different ways across various research disciplines. Some use the term in a rather abstract way “to refer to the phonological organization of segments into higher-level constituents and to the pattern of relative prominences within these constituents” (Shattuck-Hufnagel & Turk, 1996, p. 196). Others use it to refer to “the realization itself, that is, [they] effectively use it as a synonym for *suprasegmental features*” (Cutler, Dahan, & van Donselaar, 1997, p. 142), such as pitch, tempo, loudness, or duration. Adherents of the second definition would, for example, not “consider the structure of syllables to fall within the study of prosody” (Cutler et al., 1997, p. 142). Conversely, adherents of the first definition would, for instance, not accept paralinguistic qualities, such as information about a speaker's emotional state (e.g., whether the speaker is happy or sad), identity (e.g., gender, age), attitude (e.g., whether the speaker is friendly or hostile), or the social or regional group he or she belongs to (or aspires to belong to), to be channeled through prosody. Perhaps the most common definition of prosody falls somewhere between these two extremes, merging both the higher level organization and the phonetic reflexes of

1 this organization. This definition explains prosody as “the linguistic struc-  
2 ture which determines the suprasegmental properties of utterances”  
3 (Cutler et al., 1997, p. 142). This definition is the one we adopt in this  
4 introduction. However, as none of the articles in this special issue is  
5 concerned with paralinguistic aspects of prosody, this introduction  
6 focuses on the linguistics aspects of prosody, although we acknowledge  
7 that this separation is artificial, as both linguistic information and  
8 paralinguistic information are transported through the same acoustic  
9 medium.  
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11 Prosody is present in every spoken utterance, such that any  
12 utterance—no matter how short or in which language it is spoken—  
13 must have a certain duration, loudness, or pitch (Cutler et al., 1997).  
14 It is therefore not surprising that prosody plays a very central role in  
15 human communication. It is used to convey a variety of types of infor-  
16 mation. For instance, prosody can clarify the grammatical or discourse  
17 function of an utterance, such that, if the phrase *Mile End is in London*  
18 is said with a falling pitch, it often (although not always) represents a  
19 statement, whereas if the same sequence of words is said with a rising  
20 pitch, it often indicates a question. Similarly, falling pitch, in combina-  
21 tion with lengthening of the final syllable, may be an indicator that the  
22 speaker has finished his or her turn. Rising pitch or a high-level pitch on  
23 the last syllable in *Mile End is in London* may indicate that the speaker  
24 wants to continue speaking and is not ready to hand over his or her turn  
25 to another speaker. In this example, prosody is used to give information  
26 about the dialogue. Another function of prosody is to make important  
27 information stand out. If one were to say *Mile End is in LONDON*, it  
28 sounds as if London is contrasted with something else, such as *Mile End*  
29 *is in London, not Birmingham*. This emphasis or focusing of the attention  
30 on the word *London* is cued (at least in English) primarily by acoustic  
31 patterns of fundamental frequency (F0), duration, and amplitude  
32 (e.g., Lehiste, 1970). These acoustic cues are perceived by listeners  
33 as pitch, length, and loudness, such that the stressed syllable of the  
34 emphasized word is perceived as higher, longer, and louder in compar-  
35 ison to the words and syllables that are not emphasized. Other acoustic  
36 cues that are known to be important in the perception of prominence  
37 are spectral modulations (including formant structures), vowel quality,  
38 and vowel reduction (Shattuck-Hufnagel & Turk, 1996), and the various  
39 acoustic parameters are thought to interact with one another to signal  
40 prominence.  
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42 In a similar way, prosody can also be used to convey lexical meaning.  
43 In many languages, words can be distinguished on the basis of lexical  
44 stress, such that the English word *FOREbear* is an ancestor, whereas  
45 *forBEAR* is a verb meaning to refrain from or to abstain (examples are  
46 taken from Cutler et al., 1997). Despite the spelling difference, there are  
47 no segmental differences between these words; they only differ in their  
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1 stress placement. In such words, English listeners tend to use the afore-  
2 mentioned primary acoustic cues in perception and to judge syllables  
3 as stressed when they are of longer duration, have higher pitch, and are  
4 louder than other syllables (Cutler, 2005). Words that differ only in  
5 stress placement are, however, rather rare. In English, only a few dozen  
6 minimal stress pairs exist (Cutler & Pasveer, 2006). Typically, syllables  
7 that differ in stress also differ in vowel quality; for example, in the words  
8 *CONtest* and *conTEST*, the first syllable (*con-*) of the word *CONtest* has a  
9 full vowel, whereas in *conTEST* that vowel is reduced. In such cases,  
10 listeners also attend to vowel quality (alongside the cues of duration,  
11 pitch, and loudness) to determine whether a syllable is stressed.

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13 A final function of prosody that we discuss here is that of grouping  
14 constituents that belong together. This particular function of what we  
15 call *prosodic phrasing* is closely related to syntax. Through prosody,  
16 words can be grouped into larger chunks of speech to signal major  
17 syntactical boundaries or paragraph boundaries and to disambiguate  
18 utterances of which the syntax is ambiguous. To give an example, the  
19 sentence *When you learn gradually you worry more* could be divided, for  
20 instance, into the chunks *when you learn* and *gradually you worry more*  
21 or the chunks *when you learn gradually* and *you worry more*. These  
22 chunks or groupings are signaled prosodically by means of pausing,  
23 lengthening of the syllable at the end of a phrase, a change in pitch  
24 direction, or any combination of these. The actual location of the  
25 prosodic boundaries corresponds to a different meaning: The location  
26 of the boundary in the first example (*When you learn, gradually you*  
27 *worry more*) implies that the worrying increases gradually, whereas the  
28 second example (*When you learn gradually, you worry more*) refers to  
29 gradual learning (examples are taken from Price, Ostendorf, Shattuck-  
30 Hufnagel, & Fon, 1991). Although prosodic phrasing often mirrors syn-  
31 tactical structure, not all syntactic boundaries are signaled by prosody,  
32 and disfluencies can also occur at places that do not coincide with  
33 syntactical boundaries.  
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## 38 PROSODY IN SLA

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40 Given the complexity and the multitude of functions of prosody, it is  
41 perhaps not surprising that prosodic properties are notoriously difficult  
42 to learn (Atoye, 2005; Cruz-Ferreira, 1989) and are often seen as “the  
43 final hurdle, which a vast majority of speakers of English as a foreign  
44 language never manage to cross” (Banjo, 1979, p. 12; although this  
45 seems to be an observation that holds for the L2 acquisition of lan-  
46 guages other than English as well). Indeed, learning how to produce L2  
47 prosody is complicated, as languages differ not only in prosodic struc-  
48 ture but also in how prosodic properties are implemented in terms of  
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1 their suprasegmentals such as pitch, tempo, loudness, or duration  
2 (e.g., Cutler et al., 1997). For example, languages are thought to differ  
3 intonationally along four dimensions (Ladd, 1996): (a) the systemic  
4 dimension—that is, the inventory of structural elements (pitch accents  
5 and boundary phenomena); (b) the functional dimension—that is, how  
6 these elements are used to signal certain linguistic functions (such as  
7 interrogativity or focus); (c) the distributional dimension—that is, how  
8 often the different structural elements are used and how they combine;  
9 and (d) the realizational dimension—that is, the phonetic implementa-  
10 tion of these structural elements, which describes the way in which the  
11 systemic elements of intonation are phonetically realized (e.g., how the  
12 pitch accents align with the segments, and what their relative height  
13 is in a given utterance). Therefore, to master the intonation of a  
14 language, the L2 learner not only needs to master its structural ele-  
15 ments (pitch accents and boundary tones) but also needs to learn how  
16 these structural elements are phonetically realized, how they combine  
17 into contours, and how they are used to signal meaning. Similarly, when  
18 learning how to make certain information stand out in a L2, the learner  
19 has to be aware of which linguistic means are used for marking information  
20 structure in that language—whether, to highlight certain information, it  
21 uses word order (e.g., Greek), uses a distinct pitch accent (e.g., Portu-  
22 guese), or places a pitch accent on the constituent in focus and deac-  
23 cents any information that follows (e.g., Germanic languages). Acquiring  
24 other prosodic properties, such as rhythm, stress, or lexical tone, must  
25 invoke similar difficulties for the L2 learner, because languages vary in  
26 equally complex ways in terms of how they instantiate these prosodic  
27 properties.  
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31 Although there is general agreement that L2 learners have significant  
32 and continuing problems learning to produce nonnative prosody, there  
33 is far less agreement as to what the underlying cause or causes of these  
34 problems are. In an attempt to identify the nature of the problem, one  
35 line of research in the field of L2 prosody has therefore been to charac-  
36 terize the difficulties that learners experience. As previously described,  
37 a possible source of the difficulty may be the complexity and multidim-  
38 ensionality of prosody. Another assumption that is generally made is  
39 that the difficulty is perceptual in nature or related to difficulties in the  
40 processing of prosody. As with segments, it is generally assumed that  
41 the perception of L2 prosody is, to a large extent, influenced by or filtered  
42 through the prosodic regularities of the L1. However, experimental  
43 studies investigating prosody perception and processing have only  
44 recently started to appear, addressing, among other topics, how tone  
45 (Gandour, 1983; So & Best, 2010; Wang, Jongman, & Sereno, 2003), stress  
46 (Altmann, 2006; Dupoux, Pallier, Sebastian, & Mehler, 1997; Dupoux,  
47 Sebastián-Gallés, Navarrete, & Peperkamp, 2008; Tremblay, 2008), and  
48 intonation (A. Chen, Gussenhoven, & Rietveld, 2004; Cruz-Ferreira, 1987;  
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AQ3 1 Grabe, Rosner, García-Albea, & Zhou, 2003; Shen, 1990) are perceived.  
2 Indeed, findings suggest that most difficulties learners experience when  
3 producing L2 prosody appear to be perceptually motivated. However,  
4 results also suggest that not all prosodic difficulties can be attributed to  
5 the transfer of perceptual strategies from the L1, as learners sometimes  
6 exhibit prosodic strategies that exist neither in the L1 nor in the L2  
7 (Archibald, 1997). In fact, good prosodic perception skills in the L2 do  
8 not necessarily lead to good production of L2 prosody. Similarly, it is  
9 possible for learners to perform poorly in perception yet to display  
10 targetlike prosody in L2 production (Altmann, 2006). This suggests that  
11 prosodic difficulties are not due solely to problems in L2 perception,  
12 and other causes, such as motor production constraints or problems  
13 with the storage of prosodic information in long-term memory, may also  
14 need to be considered.

16 Alongside attempts to determine the nature of the persistent difficulties  
17 L2 learners experience with L2 prosody, research has also focused on how  
18 nontargetlike prosody is perceived and interpreted by native listeners.  
19 Much of this research is concerned with the contribution of prosody to  
20 the perception of foreign accent. Studies repeatedly show that prosodic  
21 phenomena contribute to foreign accent detection (e.g., Anderson-Hsieh  
22 et al., 1992; Jilka, 2000; Magen, 1998; Munro, 1995; Trofimovich & Baker,  
23 2006; Van Els & de Bot, 1987). Although the majority of these studies  
24 focused on the role of intonation in the perception of foreign accent,  
25 there is also evidence for the influence of other prosodic properties,  
26 such as pitch range and stress (Kang, 2010), speaking rate (Munro &  
27 Derwing, 2001), timing (Tajima, Port, & Dalby, 1997), and phonotactics  
28 and rhythm (e.g., Carter, 2005; Grenon & White, 2008; Gut, 2003; White &  
29 Mattys, 2007). Much of the work in this area has made use of digital signal  
30 processing and manipulation techniques. For instance, the technique  
31 of low-pass filtering suppresses the segmental information of speech  
32 (rendering it unintelligible) but preserves most prosodic properties.  
33 Such techniques have also made it possible to study the relative contri-  
34 bution of prosody and segments to the perception of foreign accent.  
35 As yet, findings are inconclusive, with some studies showing segments  
36 to be more important (Boula de Mareüil, Marotta, & Adda-Decker, 2004)  
37 and others reporting either an equal role for prosody and segments  
38 (Munro, 1995) or a larger role for prosody in foreign accent perception  
39 (e.g., Anderson-Hsieh et al., 1992; Boula de Mareüil & Vieru-Dimulescu,  
40 2006; Carmichael, 2000; Magen, 1998). Foreign accented speech need  
41 not necessarily affect intelligibility or comprehensibility. Even heavily  
42 accented speech, whether from nontargetlike segments or nontargetlike  
43 prosody (or indeed a combination of the two), can be highly intelligible  
44 (Derwing & Munro, 1997; Munro & Derwing, 1995). To date, the research  
45 examining the contribution of prosody to intelligibility or comprehensi-  
46 bility has been quite limited. A study by Tajima et al. (1997) showed that  
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1 correcting prosodic (in this case rhythmic) properties of L2 speech led  
2 to improved intelligibility of the speakers, whereas Munro and Derwing  
3 (1995) and Derwing and Munro (1997) found that prosodic deviances of L2  
4 speech negatively influenced both intelligibility and comprehensibility.  
5 Braun, Lemhöfer, and Mani (2011) showed that deviances in the language-  
6 specific implementation of stress (i.e., by placing stress on the correct  
7 syllable but using the wrong acoustic cues) may also affect speech  
8 comprehension. Similarly, presenting native speakers with nonnative  
9 intonation contours was found to slow down lexical access, showing  
10 that nonnative prosody affects comprehensibility (Braun, Dainora &  
11 Ernestus, 2011). Research on the effects of nontarget prosody on com-  
12 munication ability will ultimately benefit the L2 learner, as the goal of  
13 any learner is to yield successful communication in the L2. Research of this  
14 kind will highlight which prosodic aspects promote intelligibility and  
15 will identify those deviations that are detrimental to communication.  
16 This information is bound to be valuable to foreign language teaching,  
17 in which the focus in the area of phonology has, until recently, been on  
18 the teaching of segmentals (Derwing, 2008; Munro, 2008).  
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## 21 22 **THE SPECIAL ISSUE** 23

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25 The articles included in this special issue document a variety of cutting-  
26 edge approaches to investigating prosody in SLA. The articles cover the  
27 L2 acquisition of a range of prosodic phenomena, such as tone, intonation,  
28 and rhythm, in a variety of L1 and L2 combinations and proficiency levels.  
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30 We begin the issue with a study on the cross-language perception of  
31 tone (So & Best). Although all languages use pitch for communicative  
32 purposes, some languages and dialects additionally use pitch to distin-  
33 guish the lexical or grammatical meaning of otherwise identical words  
34 (Ladd, 1996). On this basis, languages are often divided into tone  
35 languages (which systematically use tone to express lexical or gram-  
36 matical distinctions) and nontone languages (which use pitch for into-  
37 national or pragmatic purposes). The few studies on L2 acquisition of  
38 lexical tones suggest that tones are difficult to acquire by speakers of  
39 nontone languages (e.g., G. T. Chen, 1974; Miracle, 1989; Shen, 1989).  
40 These studies show that L2 learners often produce errors in either  
41 the register (i.e., they are too high or too low) or pitch direction  
42 (e.g., substituting a level tone with falling pitch) of tones. In terms  
43 of perception, the majority of studies have been confined to cross-  
44 language (rather than L2) studies, which examine whether speakers of  
45 tone and nontone languages differ in the way they perceive and process  
46 lexical tones. Findings generally suggest that the perception of nonna-  
47 tive tones is substantially influenced by the listeners' native language  
48 (Gandour, 1983; Lee, Vakoch, & Wurm, 1996; Wayland & Guion, 2004).  
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1 In the first article of the special issue, So and Best investigate how  
2 listeners of nontone languages perceive nonnative lexical tones in con-  
3 nected speech, an issue that has largely escaped detailed attention to  
4 date. So and Best investigate how listeners of two nontone languages,  
5 Australian English and French, perceive Mandarin tones in a sentence  
6 environment and how they categorize the four Mandarin tones into  
7 their native sentence intonation categories. They argue that lexical  
8 stress differences between French and English listeners may have  
9 affected their ability to perceive the phonetic differences between the  
10 Mandarin Tone 3 (low falling) and Tone 4 (high falling). Speakers of French,  
11 which lacks lexical stress, are able to perceive the differences, whereas  
12 speakers of English, a lexical stress language, are not. So and Best argue  
13 that the presence of lexical stress may have led English listeners to  
14 perceive the tones as conveying both lexical stress and sentencelike  
15 intonation.  
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17 The next article targets the L2 acquisition of speech rhythm (Li &  
18 Post). Traditionally, languages have been divided, according to their  
19 perceived rhythmical differences, into stress-timed versus syllable-  
20 timed languages. In stress-timed languages (e.g., English), stress was  
21 thought to occur at approximately equal intervals in time, whereas in  
22 syllable-timed languages (e.g., French), each syllable was thought to be  
23 of equal duration. This has led to the search for quantitative measures  
24 that could support the percept of a rhythmic distinction between  
25 languages. These rhythm metrics have provided empirical evidence in  
26 support of the percept of rhythm class that is scalar rather than categor-  
27 ical. Li and Post exploit these rhythmical differences between languages  
28 to examine the acquisition of rhythm in Mandarin Chinese and German  
29 learners of English at different proficiency levels. They investigate to  
30 what extent rhythm metrics as well as the prosodic properties of accen-  
31 tual lengthening and phrase-final lengthening that contribute to speech  
32 rhythm reflect different levels of L2 proficiency. Their analyses show  
33 that accentual lengthening and phrase-final lengthening as well as most  
34 rhythm metrics discriminated well between L2 proficiency levels. They  
35 show that both transfer effects and universal constraints play a role in  
36 the acquisition of L2 speech rhythm, and they argue for the multisys-  
37 temic nature of L2 prosodic acquisition in which various prosodic prop-  
38 erties may interact with and depend on one another in the acquisition  
39 process.  
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41 Speech rhythm is also one of the prosodic phenomena investigated in  
42 the third article of this special issue, by Gabriel and Kireva, which  
43 focuses on the Spanish-Italian contact variety spoken in Buenos Aires  
44 (Porteño). It probes to what extent patterns of rhythm and intonation,  
45 which are typical of Italian, show up in Porteño and in the L2 Castilian  
46 Spanish produced by Italian native speakers. Their study reveals that  
47 the rhythm metrics displayed in Italian surface in both Porteño and L2  
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1 Castilian Spanish speech (spoken by native Italian speakers). This finding  
2 supports the hypothesis that the change in Porteño prosody is a result  
3 of transfer from the L1 that occurred when Italian immigrants learned  
4 Spanish as a L2 in Argentina. The findings for intonation, however, only  
5 partially support the transfer hypothesis for Porteño Spanish. Contem-  
6 porary Porteño is found to always realize yes-no questions with a falling  
7 pitch movement rather than differentiating the different pragmatic  
8 meanings conveyed by Castilian Spanish through different yes-no ques-  
9 tion contours. Therefore, Gabriel and Kireva argue that the fact that  
10 contemporary Porteño has only one pitch contour in interrogatives  
11 may be the result of overgeneralization due to markedness in the L2  
12 acquisition of this variability.  
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14 The next two studies in this special issue target the production of  
15 intonation in SLA. Gut and Pillai probe the potential crosslinguistic  
16 influences of the prosodic systems of Malay speakers of L2 English, by  
17 focusing on their marking of information structure. The study investi-  
18 gates the prosodic correlates of focus and givenness both in Malay and  
19 in the English produced by native speakers of Malay. To this end, word  
20 pairs of given and new information are compared in terms of their syl-  
21 lable duration, type of pitch accent, phonetic realization of the rise, and  
22 pitch peak alignment. They find that, although in most of the measures  
23 no differences are observed between the Malay and English spoken by  
24 the speakers, not all patterns of marking new and given information in  
25 the speakers' L2 English can be explained solely by crosslinguistic influ-  
26 ences. In particular, they find that speakers tend to alter some prosodic  
27 features (e.g., in the type of pitch accents) in their L2 and produce error  
28 patterns (e.g., not deaccenting the given information) that are commonly  
29 observed in the speech of L2 speakers from different L1 backgrounds;  
30 these findings—with those of Li and Post—suggest that universal  
31 constraints may play a role in the acquisition of information structure  
32 in a L2.  
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34 The study by Mennen, Schaeffler, and Dickie focuses on another aspect  
35 of intonation production in SLA—namely, that of pitch range produced  
36 by German learners of L2 English of moderate to advanced proficiency.  
37 They base their study on prior research that found that the cross-  
38 language differences between native English and German speakers are  
39 position sensitive in nature. That is, the cross-language differences  
40 depend on where in an intonation contour measures are taken, with  
41 a wider range for English speakers in earlier parts but a narrower range  
42 in later parts of intonational phrases (Mennen, Schaeffler, & Docherty,  
43 2012). Their study tests whether German learners of L2 English are sen-  
44 sitive to such position-sensitive differences in the target language or  
45 whether they are only able to produce the cross-language differences  
46 that are more global in nature. Their results show that the German  
47 learners predominantly produce pitch range values that approximate  
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1 the L2 target. The German learners expand their pitch range toward the  
 2 L2 English target in the early parts of intonation phrases and compress  
 3 it in later parts, supporting a position-sensitive adaptation toward the  
 4 target language. Overall, Mennen, Schaeffler, and Dickie argue that the  
 5 choice of measures may be crucial for determining the underlying cause  
 6 of the difficulty L2 learners may experience when attempting to adopt  
 7 language-appropriate pitch range in the L2.  
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9 Continuing with the theme of intonation, the final study in this special  
 10 issue examines the perception and production of sentential English  
 11 focus by Mandarin and Spanish learners of L2 English. Ortega-Llebaria  
 12 and Colantoni test the extent to which higher level processing influ-  
 13 ences L2 perception and the production of focus intonation; they do so  
 14 by manipulating the levels of access to meaning. Their findings show  
 15 that, in tasks that facilitate access to meaning (i.e., tasks with an increased  
 16 level of prosody processing requiring mapping of intonation forms to  
 17 meaning), more L1 transfer is observed than in tasks with lower levels  
 18 of prosody processing (i.e., tasks in which access to meaning is not  
 19 crucial and attention to acoustic cues is sufficient to perform the task).  
 20 Overall, Ortega-Llebaria and Colantoni argue that, to master the intona-  
 21 tion of the target language, the L2 learner not only needs to master its  
 22 specific melody but also needs to learn how that melodic form matches  
 23 to meaning in that language. Crucially though, Ortega-Llebaria and  
 24 Colantoni's article argues that access to meaning and L1 transfer are  
 25 likely to influence each other.  
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### 34 REFERENCES

- 35 Altmann, H. (2006). *The perception and production of second language stress: A cross-linguistic*  
 36 *experimental study* (Unpublished doctoral dissertation). University of Delaware, Newark.  
 37 Anderson-Hsieh, J., Johnson, R., & Koehler, K. (1992). The relationship between native  
 38 speaker judgments of nonnative pronunciation and deviance in segmentals, prosody,  
 39 and syllable structure. *Language Learning*, 42, 529–555.  
 40 Archibald, J. (1997). The acquisition of English stress by speakers of nonaccentual languages:  
 41 Lexical storage versus computation of stress. *Linguistics*, 35, 167–181.  
 42 Atoye, R. O. (2005). Non-native perception and interpretation of English intonation. *Nordic*  
 43 *Journal of African Studies*, 14, 26–42.  
 44 Banjo, A. (1979). Beyond intelligibility in Nigerian English. In E. Ubahakwe (Ed.), *Varieties*  
 45 *and functions of English in Nigeria* (pp. 7–13). Ibadan: African Universities Press.  
 46 Bongaerts, T., Van Summeren, C., Planken, B., & Schils, E. (1997). Age and ultimate attainment  
 47 in the pronunciation of a foreign language. *Studies in Second Language Acquisition*,  
 48 19, 447–465.  
 49 Boula de Mareüil, P., Marotta, G., & Adda-Decker, M. (2004). Contribution of prosody to  
 the perception of Spanish/Italian accents. In B. Bel & I. Marlien (Eds.), *Proceedings of*  
*2nd International Conference on Speech Prosody, Nara, Japan* (pp. 681–684). Aix-en-  
 Provence, France: Université de Provence.

- 1 Boula de Mareüil, P., & Vieru-Dimulescu, B. (2006). The contribution of prosody to the  
2 perception of foreign accent. *Phonetica*, 63, 247–267.
- 3 Braun, B., Dainora, A., & Ernestus, M. (2011). An unfamiliar intonation contour slows  
4 down online speech comprehension. *Language and Cognitive Processes*, 26, 350–375.
- 5 Braun, B., Lemhöfer, K., & Mani, N. (2011). Perceiving unstressed vowels in foreign-  
6 accented English. *Journal of the Acoustical Society of America*, 129, 376–387.
- 7 Carmichael, L. (2000). *Measurable degrees of foreign accent: A correlational study of produc-*  
8 *tion, perception, and acquisition* (Unpublished master's thesis). University of Washington,  
9 Seattle.
- 10 Carter, P. M. (2005). Prosodic variation in SLA: Rhythm in an urban North Carolina Hispanic  
11 community. *Penn Working Papers in Linguistics*, 11(2), 59–71.
- 12 Chen, A., Gussenhoven, C., & Rietveld, T. (2004). Language specificity in perception of  
13 paralinguistic intonational meaning. *Language and Speech*, 47, 311–349.
- 14 Chen, G. T. (1974). The pitch range of English and Chinese speakers. *Journal of Chinese*  
15 *Linguistics*, 2, 159–171.
- 16 Cruz-Ferreira, M. (1987). Non-native interpretive strategies for intonational meaning: An  
17 experimental study. In A. James & J. Leather (Eds.), *Sound patterns in second language*  
18 *acquisition* (pp. 103–120). Dordrecht: Forus.
- 19 Cruz-Ferreira, M. (1989). A test for non-native comprehension of intonation in English.  
20 *International Review of Applied Linguistics in Language Teaching*, 17, 23–39.
- 21 Cutler, A. (2005). Lexical stress. In D. B. Pisoni & R. E. Remez (Eds.), *The handbook of speech*  
22 *perception* (pp. 264–289). Oxford: Blackwell.
- 23 Cutler, A., Dahan, D., & van Donselaar, W. (1997). Prosody in the comprehension of  
24 spoken language: A literature review. *Language and Speech*, 40, 141–201.
- 25 Cutler, A., & Pasveer, D. (2006). Explaining cross-linguistic differences in effects of lexical  
26 stress on spoken-word recognition. In R. Hoffmann & H. Mixdorff (Eds.), *Proceedings of*  
27 *the 3rd International Conference on Speech Prosody* (pp. 237–240). Dresden: TUD Press.
- 28 Derwing, T. M. (2008). Curriculum issues in teaching pronunciation to second language  
29 learners. In J. G. Hansen Edwards & M. L. Zampini (Eds.), *Phonology and second*  
30 *language acquisition* (pp. 347–369). Amsterdam: Benjamins.
- 31 Derwing, T. M., & Munro, M. J. (1997). Accent, intelligibility, and comprehensibility:  
32 Evidence from four L1s. *Studies in Second Language Acquisition*, 19, 1–16.
- 33 Dupoux, E., Pallier, C., Sebastian, N., & Mehler, J. (1997). A destressing “deafness” in  
34 French? *Journal of Memory and Language*, 36, 406–421.
- 35 Dupoux, E., Sebastián-Gallés, N., Navarrete, E., & Peperkamp, S. (2008). Persistent stress  
36 “deafness”: The case of French learners of Spanish. *Cognition*, 106, 682–706.
- 37 Gandour, J. (1983). Tone perception in Far Eastern languages. *Journal of Phonetics*, 11,  
38 149–175.
- 39 Grabe, E., Rosner, B. S., García-Albea, J. E., & Zhou, X. (2003). Perception of English intonation  
40 by English, Spanish, and Chinese listeners. *Language and Speech*, 46, 375–401.
- 41 Grenon, I., & White, L. (2008). Acquiring rhythm: A comparison of L1 and L2 speakers of  
42 Canadian English and Japanese. In H. Chan, H. Jacob, & E. Kapia (Eds.), *Proceedings of*  
43 *the 32nd annual Boston University Conference on Language Development* (pp. 155–166).  
44 Somerville, MA: Cascadilla Press.
- 45 Gut, U. (2003). Prosody in second language speech production: The role of the native  
46 language. *Fremdsprachen Lehren und Lernen*, 32, 133–152.
- 47 Gut, U. (2009). *Non-native speech: A corpus-based analysis of phonological and phonetic*  
48 *properties of L2 English and German*. Frankfurt: Peter Lang.
- 49 Jilka, M. (2000). *The contribution of intonation to the perception of foreign accent* (Unpublished  
doctoral dissertation). University of Stuttgart.
- Kang, O. (2010). Relative salience of suprasegmental features on judgments of L2 compre-  
hensibility and accentedness. *System*, 38, 301–315.
- Ladd, D. R. (1996). *Intonational phonology*. Cambridge: Cambridge University Press.
- Lee, Y., Vakoch, D., & Wurm, L. (1996). Tone perception in Cantonese and Mandarin:  
A cross-linguistic comparison. *Journal of Psycholinguistic Research*, 25, 527–544.
- Lehiste, I. (1970). *Suprasegmentals*. Cambridge, MA: MIT Press.
- Magen, H. (1998). The perception of foreign-accented speech. *Journal of Phonetics*, 26, 381–400.
- Mennen, I. (2004). Bi-directional interference in the intonation of Dutch speakers of Greek.  
*Journal of Phonetics*, 32, 543–563.

- 1 Mennen, I., Schaeffler, F., & Docherty, G. (2012). Cross-language differences in fundamen-  
2 tal frequency range: A comparison of English and German. *Journal of the Acoustical*  
3 *Society of America*, 131, 2249–2260.
- 4 Miracle, W. C. (1989). Tone production of American students of Chinese: A preliminary  
5 acoustic study. *Journal of Chinese Language Teachers Association*, 24, 49–65.
- 6 Munro, M. J. (1995). Nonsegmental factors in foreign accent. *Studies in Second Language*  
7 *Acquisition*, 17, 17–34.
- 8 Munro, M. J. (2008). Foreign accent and speech intelligibility. In J. G. Hansen Edwards &  
9 M. L. Zampini (Eds.), *Phonology and second language acquisition* (pp. 193–218).  
10 Amsterdam: Benjamins.
- 11 Munro, M. J., & Derwing, T. M. (1995). Foreign accent, comprehensibility, and intelli-  
12 gibility in the speech of second language learners. *Language Learning*, 45, 73–97.
- 13 Munro, M. J., & Derwing, T. M. (2001). Modeling perceptions of the accentedness and  
14 comprehensibility of L2 speech: The role of speaking rate. *Studies in Second Language*  
15 *Acquisition*, 23, 451–468.
- 16 Pickering, L. (2004). The structure and function of intonational paragraphs in native and  
17 nonnative speaker instructional discourse. *English for Specific Purposes*, 23, 19–43.
- 18 Piske, T., MacKay, I. R. A., & Flege, J. E. (2001). Factors affecting degree of foreign accent  
19 in an L2: A review. *Journal of Phonetics*, 29, 191–215.
- 20 Price, P. J., Ostendorf, M., Shattuck-Hufnagel, S., & Fong, C. (1991). The use of prosody in  
21 syntactic disambiguation. *Journal of the Acoustical Society of America*, 90, 2956–2970.
- 22 Scovel, T. (2000). A critical review of the critical period research. *Annual Review of*  
23 *Applied Linguistics*, 20, 213–223.
- 24 Shattuck-Hufnagel, S., & Turk, A. (1996). A prosody tutorial for investigators of auditory  
25 sentence processing. *Journal of Psycholinguistic Research*, 25, 193–247.
- 26 Shen, X. S. (1989). Toward a register approach in teaching Mandarin tones. *Journal of*  
27 *Chinese Language Teachers Association*, 24, 27–47.
- 28 Shen, X. S. (1990). Ability of learning the prosody of an intonational language by speakers  
29 of a tonal language: Chinese speakers learning French prosody. *International Review*  
30 *of Applied Linguistics in Language Teaching*, 28, 119–134.
- 31 So, C. K., & Best, C. T. (2010). Cross-language perception of non-native tonal contrasts:  
32 Effects of native phonological and phonetic influences. *Language and Speech*, 53,  
33 273–293.
- 34 Tajima, K., Port, R., & Dalby, J. (1997). Effects of temporal correction on intelligibility of  
35 foreign-accented English. *Journal of Phonetics*, 25, 1–24.
- 36 Tremblay, A. (2008). Is second language lexical access prosodically constrained? Process-  
37 ing of word stress by French Canadian second language learners of English. *Applied*  
38 *Psycholinguistics*, 29, 553–584.
- 39 Trofimovich, P., & Baker, W. (2006). Learning prosody and fluency characteristics of L2  
40 speech: The effect of experience on child learners' acquisition of five suprasegmentals.  
41 *Applied Psycholinguistics*, 28, 251–276.
- 42 Van Els, T., & de Bot, K. (1987). The role of intonation in foreign accent. *Modern Language*  
43 *Journal*, 71, 147–155.
- 44 Wang, Y., Jongman, A., & Sereno, J. A. (2003). Acoustic and perceptual evaluation of  
45 Mandarin tone productions before and after perceptual training. *Journal of the Acoustical*  
46 *Society of America*, 113, 1033–1044.
- 47 Wayland, R., & Guion, S. (2004). Training English and Chinese listeners to perceive Thai  
48 tones: A preliminary report. *Language Learning*, 54, 681–712.
- 49 White, L., & Mattys, S. (2007). Calibrating rhythm: First language and second language  
studies. *Journal of Phonetics*, 35, 501–522.

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