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Effects of L1 on L2 Pronunciation:
Italian Prosody in English

1. Introduction

In the present-day globalized world, communication in English takes place largely between speakers from different linguistic and cultural backgrounds, and is characterized by a wide variety of forms and uses, reflecting the geographical area, purposes and speakers involved in the interactions. A large amount of research is being carried out, in both theoretical and applied linguistics, to describe the linguistic variability observed in multilingual and multicultural situations (Graddol, 2006; Kachru, 1985, 1991; Trudgill, 1998) and to study what contributes to successful intercultural communication and what hinders it. Also, a lively international debate is taking place on what norms and standards should be used for English as a Global Language. This has given impulse to the development of new pedagogic practices and approaches, often representing "a *paradigm shift* away from conventional EFL models" (Graddol, 2006: 15). However, much research is still needed to investigate, for both theoretical and didactic purposes, the variations in the different linguistic features (at the syntactic, semantic, phonetic-phonological, and textual levels), as well as the socio-pragmatic aspects of interlinguistic and intercultural communication in English.

The aim of this chapter is to contribute to studies on International English by investigating aspects of L2 pronunciation in English. Specifically, the object of the present investigation is the comparison of prosodic patterns in English sentences produced by native and non-native (i.e., Italian) speakers. Because the Italian and English phonological systems differ at the levels of segment

inventories, rhythmic tendencies and prosodic patterns, it is expected that speakers of the two languages produce and respond to different prosodic information, which may affect Italian speakers' intelligibility and successful communication in English. The results of the analysis give indications for further studies and are discussed in the perspective of pronunciation teaching.

2. Intelligibility in L2 speech: definition, assessment and pronunciation teaching

2.1. Towards a definition of intelligibility

In studies aimed at investigating what contributes to successful intercultural communication and what hinders it, one of the factors which is considered crucial is *intelligibility*, which has been defined as the speaker's ability to recognize and understand words and utterances that are part of the interlocutor's intended message (Munro and Derwing, 1995a; 1995b; Smith, 1992). Intelligibility should be distinguished from *comprehensibility,* which refers to the speaker's ability to understand the contextual meaning of the word or utterance (Derwing and Munro, 1997), and from *interpretability*, or the speaker's ability to understand the interlocutor's intentions (Jenkins, 2000; Smith and Nelson*,* 1985; Smith, 1992).

Few would disagree that intelligibility plays an important role in ensuring successful communication between speakers from different linguistic backgrounds. However, a clear, objective characterization of intelligibility, in terms of both linguistic and paralinguistic features, is still missing (Pickering, 2006).

Pronunciation in L2 is considered to play an important role in determining the intelligibility of an utterance (Jenkins, 2000; Seidlhofer, 2004; Munro and Derwing, 1995a; 1995b; Munro et al., 2006; Patil, 2006; Pickering, 2006). In fact, a non-native speaker's pronunciation of L2 may present features which differ, at the segmental and

suprasegmental levels, from the expected L1 pronunciation. This happens because the learner's native phonological system interferes with the acquisition of the second language, by causing the learner to interpret and produce the sounds of the second language following the rules of the phonological system of his/her native language (Hongyan, 2007). The similarities and differences between the L1 and L2 phonological systems will affect the degree of interference between L1 and L2. According to Flege (for example, 2002) the phonetic similarity between L1 and L2 phonemes may disfavor the acquisition of L2 sounds, which may instead occur when L2 sounds are different enough from existing L1 categories. In other words, the greater the perceived dissimilarity of an L2 sound from an L1 sound, the more likely a new category will be formed for the L2 sound.

Non-native pronunciation is related to what has been traditionally referred to as *foreign accent* or simply *accent*, which seems to be based on the listener's perception of the number of co-occurring linguistic deviations not expected in his/her native language (Anderson-Hsieh et al., 1992; Barb, 2005; Flege, 2002; Hongyan and van Heuven, 2007; Morley, 1991; Munro, 1998).

Though accentedness is believed to impair L2 speech intelligibility, there is no simple and obvious correlation between accentedness and intelligibility. In fact, studies show that light-accented speech may be unintelligible and, viceversa, heavy-accented speech may be intelligible (Derwing and Munro, 1997; Munro and Derwing, 1995a, 1995b; Pickering, 2006). The degree to which accented speech interferes with intelligibility seems to depend on the particular social, cultural and linguistic contexts in which interactions take place, and particularly on the speakers and/or listeners involved (Bent and Bradlow, 2003; Field, 2003; Lindemann, 2002; Major et al., 2002; Pickering, 2006; Rajadurai, 2007; Smith and Nelson, 1985). For example, the intelligibility of accented speech may be greatly enhanced by the listener's degree of familiarity with the speaker's speech, which may increase the level of expectation of co-occurrence of features deviating from the norm (Field, 2003; Gass and Marlos Varonis, 1984; Newman and Evers, 2007; Omori, 2007). On the other hand, the listener's attitude towards the speaker's personality or linguistic and cultural background, for example because of prejudice, may act as a barrier to the intelligibility of the speaker's

accented speech by preventing the listener to be cooperative with him/her (see Rajadurai, 2007 for a review). Finally, when discussing issues of intelligibility and pronunciation, one should take into account that spoken English is characterized by an infinite number of native and non-native accents, and that interactions in English may occur not only between native and non-native speakers, but also between non-native speakers with different L1s, who may have received formal instruction in English within different traditions (for example, American vs. British). One should, therefore, be careful not to equate native varieties with the norm and non-native varieties with accented, unintelligible speech (Rajadurai, 2007).

2.2. Assessment of intelligibility

Intelligibility in L1 and L2 interactions has been investigated with a variety of methods (for a review, see Pickering, 2006; Rajadurai, 2007; Munro et al. 2006). The most commonly used method to assess intelligibility is a dictation task, and requires subjects to listen to utterances and transcribe them in standard orthography; an index of the speaker's intelligibility is then determined on the basis of the number of correctly transcribed words (Bent and Bradlow, 2003; Derwing and Munro, 1997; Munro et al., 2006). Other methods involve comprehension questions (Anderson-Hsieh and Koehler, 1988), cloze tests, elicitation of summaries, etc. (Munro and Derwing, 1995a; 1995b; Perlmutter, 1989; Smith and Bisazza, 1982; Smith and Rafiqzad, 1979). While all of these methods have proved valuable, none of them alone can give a complete account of the speaker's intelligibility (Munro et al. 2006). Also, though experiments designed to test intelligibility may be well suited to assess specific linguistic features, social and psychological factors contributing to intelligibility may be harder to test. In fact, intelligibility experiments often create non-real or non-authentic situations affecting speech spontaneity and contextualization, for example through the use of recorded speech consisting of read utterances (Rajadurai, 2007).

Studies focusing on determining which linguistic features may be detrimental to intelligibility indicate that it is the *type* more than the

number of learners' mistakes that affects L2 speech intelligibility (e.g., Munro, 2008; Munro and Derwing, 2001). Prosody seems to play a critical role in the production of L2 speech as well as having an effect on judgments of foreign accent. For example, the perception of L2 fluency and speech has been found to be affected by differences in speech rate, pitch prominence, pitch range, length and location of pauses, intonation contours, and prosodic stress as characterized by acoustic parameters such as amplitude and duration (Chang, 2002; Kormos and Dénes, 2004; Munro and Derwing, 2001; Derwing and Munro, 2001; Pickering, 2002, 2004; Silipo and Greenberg, 2000; Wennerstrom, 2000). Deviations in L2 prosody may also significantly affect intelligibility in interactions between native (NS) and non-native (NNS) speakers (Anderson-Hsieh et al., 1992; Anderson-Hsieh and Koehler, 1988; Munro & Derwing, 1995a, 1995b; Derwing et al., 2002), whereas the mispronunciation of segments may be more detrimental to intelligibility than prosody in ensuring intelligibility in interactions between non-native speakers (Jenkins, 2000, 2002). This is probably due to the fact that NNS speakers are less able than NS to integrate inferences from higher contextual knowledge or from a shared linguistic background with their interlocutors (Pickering, 2006). Moreover, in general, NNS find it harder than NS to understand other NNS, probably because NNS cannot rely on contextual information as well as NS to resolve ambiguities originating from lack of phonetic/phonological differentiation (Van den Doel, 2007).

It has also been suggested that, in interactions in English between NNS, intelligibility rests on a restricted number of *core features* which seem to be crucial for mutual understanding (Jenkins, 1998, 2000, 2006; Seidlhofer 2003, 2004, 2007). These include prosodic features relating to linguistic duration, timing, stress, pitch and intonation. Some of these features are: vowel length contrasts, e.g., differences in vowel durations existing in words like 'bit' and 'beat', 'bed' and 'bad'; vowel reduction processes, which require English NNS to *reconstruct* weak forms and heavily-reduced unstressed vowels; stress assignment rules, e.g., rules for the correct placement of word and phrase stress, which are essential for determining vowel reduction processes, signalling prominence, emphasis, etc. (Jenkins, 2000, 2002, 2006; Hongyan and van Heuven, 2007).

The fact that prosody should play an important role in intelligibility is not surprising given the amount of meaning conveyed through prosody in communication. For example, prosody is used in the disambiguation of structurally ambiguous sentences and for signaling the information status of an utterance by highlighting given vs. new information, emphasis or contrast. Prosody may also define the speech function of an utterance, that is, differentiate between statements, questions, requests, etc. Finally, prosody may convey paralinguistic information, for example with regard to the emotional state of the speaker (e.g., anger, happiness, love, etc.), the truth value of the proposition (e.g., certainty vs. uncertainty) or the level of the speakers' engagement (i.e., when the speaker is seeking support, responding to something, anticipating possible responses and objections, etc.).

2.3. Intelligibility and pronunciation teaching

The interest in English as the language for international communication as well as the new awareness of the role played by prosody in L2 interactions have largely contributed to changing objectives and methods in pronunciation teaching. Traditionally, the aim of pronunciation teaching was the eradication of any trace of foreign accent, and British or American English was considered the *model* to imitate. Today, in a world characterized by an infinite number of English accents, promoting a *perfect English accent* appears unsustainable. *Intelligibility* appears as a more appropriate target of pronunciation instruction, and British and American English are not considered the only English language models which should be used in class. Also, while traditional in-class instruction tended to underemphasize prosody, today, the idea that the focus of instruction should be comprehensible speech for successful communication is leading English language teachers to emphasize pitch, stress, rhythm, coarticulation and intonation (see Busà, 2007 for a review). New technological applications are giving new impulse to the study and teaching of L2 prosody and are yielding promising results which can help investigators to understand the role of prosody in communication

as well as develop new methods and materials for enhancing students' comprehension and perception of L2 prosodic features.

3. The Italian accent in English

A well-known pronunciation problem for Italian learners of English is vowels. The production of English vowels by Italians also correlates with the Italian speakers' perceived degree of accent in English (Busà, 1995; Flege et al., 1999; Flege et al., 2003; MacKay et al., 2001; Piske et al., 2002) and may affect their intelligibility and successful communication in English. Italian speakers' difficulty with English vowels is the result of the interference and transfer of phonological rules and processes from Italian into English and can be understood by comparing the phonological systems of the two languages.

In Italian and English, differences at both the segmental and suprasegmental level concur in the phonetic and phonological definition of vowel quality and duration.

In short, Italian has seven phonemic vowels and a prominently CV-type syllabic structure with an alternation between longer vowels in open syllables and shorter vowels in closed syllables. Typologically, Italian is defined as a syllable-timed language, because it has no vowel reduction at the phonological level and limited vowel reduction at the phonetic level (Farnetani and Busà, 1999). English has a wider vowel inventory than Italian (spanning between 11-13 vowels depending on the variety of English under consideration) and a prominently CVC-type syllabic structure. It is classified as a stress-timed language, and is characterized by vowel reduction processes which affect vowel quality and duration. In addition, syntactically, English has a rather fixed word order, and uses intonation to de-accentuate syntactic elements carrying given information in an utterance. By contrast, Italian has a free word order, and assigns prominence to elements that are in focus (Avesani and Vayra, 2005; Bocci and Avesani, 2008).

Thus, Italian speakers' difficulty with English vowels is in fact caused by the interference and transfer of rules from the phonological

system of Italian at both the segmental and suprasegmental level. It seems appropriate, then, that investigations on the Italian accent in English should address the issue of vowel production from the perspective of prosody rather than simply segments.

4. Comparing prosody in the speech of English and Italian native speakers: a pilot experiment

A project is being carried out at the University of Padova to investigate the effects of Italian prosody in English L2. As part of the project, segments duration, rhythmic tendencies, vowel reduction processes, pitch and intonation contours will be analyzed and compared in the English utterances produced by English and Italian native speakers. This chapter reports the results of the first comparative observations of the intonation contours of some English sentences produced by native and non-native (i.e., Italian) speakers.

4.1. Methods and Materials

For this study, two native (NS) English speakers (from Great Britain) and eight native (NNS) Italian speakers (from the North-East of Italy) served as subjects. The subjects were asked to read aloud short dialogs. The dialogs were recorded using the speech analysis software *Praat* (freely downloadable from <http://www.fon.hum.uva.nl/praat/>), and some phrases were extracted for comparison and analysis (see below). The study was designed to obtain preliminary data on the differences in intonation patterns of three sentence types (open questions, yes-no questions, and salutations) by English and Italian speakers. Through the comparison of the native and non native sentences, the study aimed at getting evidence of how differences in intonation patterns may affect the intelligibility of the Italian–accented English speech.

4.2. Analysis

After the recordings, the three selected sentence types (open questions, yes-no questions, and salutations) were extracted from the recorded dialogs. For all sentences, visualizations of the sound waves and pitch patterns were obtained with *Praat*. The visualizations served to compare the various speakers' utterances. Figures 1-12 exemplify the type of visualizations which served for the comparative analysis. In each figure, the upper box shows the speech sound wave, and the lower box the corresponding pitch contour.

4.3. Results of the investigation

Figures 1-4 show the productions of the native speaker (Fig. 1) and three of the Italian speakers (Fig. 2-4) of the open question 'What are you doing this evening?'. It can be observed that the native speaker has a clearly falling intonation, with a prominence peak around the word 'you'. By contrast, no clearly falling intonation is visible in the productions of the Italian speakers. Instead, the intonation of the Italians is overall rather level, with minor differences exemplified by prominence peaks in 'dOIng' (Fig. 2), a final rising contour (Fig. 3), and or 'what arE YOU' (Fig. 4).
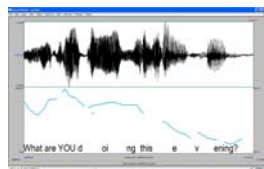

Fig. 1: What are you doing this evening? (English native speaker)

Fig. 2-4: What are you doing this evening? (Italian native speakers)

Figures 5-8 show the productions of the native speaker (Fig. 5) and three of the Italian speakers (Fig. 6-8) of the yes-no question 'Are you going?'. Here, again there is a clear difference in pattern between the native and the L2 speakers' utterances: while the native speaker (Fig. 5) shows a marked rising-falling contour, with a pitch peak on the word 'gOing', the Italian speakers' utterances (Fig. 6-8) show intonation patterns which are characterized by comparatively less prominent pitch peaks than the English speaker's, and placed in different positions in the utterances (on goiNg and ARE in Fig. 6 and 8; at the onset of the vowel in gOing in Fig. 7). In addition, one speaker (Fig. 6) also shows clearly final rising intonation, a pattern also found in the same speaker's utterance shown in Fig. 3.
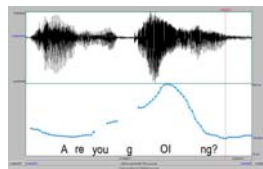

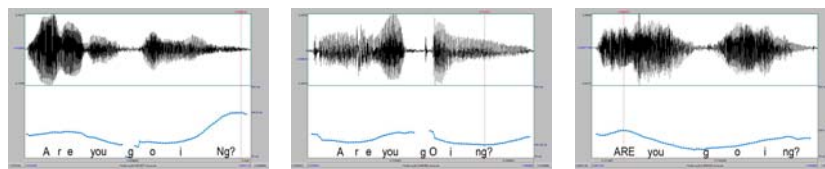Fig. 5: Are you going? (English native speaker)

Fig. 6-8: Are you going? (Italian native speakers)

Finally, Figures 9-12 show the visualizations of the utterance 'Bye!'. The native speaker's intonation contour (Fig. 9) is first rising and then level on a vowel segment that is 704 ms long. In comparison, the Italians represented in Fig. 10-11 have intonation patterns that are much more 'flat', i.e., with no clear contour or pitch peak; the speaker of Fig. 12 shows some resemblance with the native speaker, i.e., he has a raising pitch pattern in the first portion of the vowel segment, but is still far from approaching the native speaker's pattern. The difference between the English speaker and the Italian speakers is particularly evident as concerns duration, with the

Italian speakers' vowels ranging from 250 ms (Fig. 10) to 325 ms (Fig. 12), i.e., being consistently shorter than English vowels in this position.
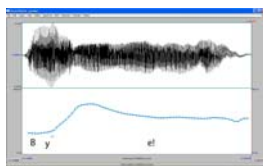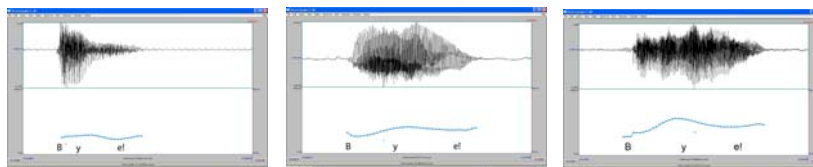

Fig. 9: Bye! (English native speaker)

Fig. 10-12: Bye! (Italian native speakers)

5. Considerations on the observed differences

The preliminary comparative investigation of the prosodic patterns produced by the Italian and the English speakers, exemplified in Figures 1-12, shows that, in fact, the utterances produced by the Italian speakers differ from the native speakers' utterances in a number of significant features. These can be summarized as follows:

1) The English utterances produced by the Italian speakers are characterized by intonation patterns which are rather unvaried across different sentence types. This is unlike the utterances produced by the native speakers, in which different sentence types are marked by different intonation contours.

2) The Italian intonation in English has an overall rather 'flat' contour, with no clear sentence stress or pitch peak, or, if present, it is markedly less prominent than in English.

3) The stressed, emphatic vowels produced by the Italian speakers are
   much shorter than the vowels produced by the native speakers.

In general terms, then, the data indicate that, when producing English
utterances, Italians fail to differentiate syntactic structures through
intonation, and do not mark prominent syllables through sentence stress,
nor assign longer duration to emphatic syllables.

What possible implications can this have on the Italians'
intelligibility in English and their overall communication effectiveness?
Also, if English listeners are used to be cued to salient information,
given/new information, emphasis, contrast, etc. through stress and pitch,
what are they going to make out of the relatively flat and unvaried
intonation contours produced by the Italians? And finally, on a
paralinguistic level, is the Italian intonation in English going to be
associated with boredom, detachment or lack of interest?

More detailed studies, both on the production and perceptual aspects
of L2 prosody, need to be conducted before these questions can be
answered. However, we can make reasonable speculations, based on what
we know of the functions of intonation in English: The inability to
distinguish between different sentence types or mark prominent syllables in
the utterance is bound to have a negative effect on communication, by
giving way to ambiguity caused by undifferentiated sentences or the de-
accentuation of salient information. This may also have paralinguistic
effects, by contributing to creating a distorted image of the speakers' levels
of engagement in the proposition, their emotional state, etc.

6. Can more native-like prosodic patterns be learned?

If prosody is crucial to intelligibility and successful communication,
language instruction should emphasize the correct pronunciation of L2
suprasegmentals. Traditionally, prosody has been considered hard to teach.
In fact, it also represents a difficult area of investigation because it involves
both physical (i.e., acoustic, articulatory and perceptual) properties of

speech, and paralinguistic information, and it is subjected to an enormous variability depending on speaker, context, geographical area, etc.

However, the growing interest in the study of suprasegmentals, generated by the recognition of the role of prosody in first and second language speech communication has caused a shift in emphasis in foreign language pronunciation teaching. In the past ten years or so, a new impulse to teaching L2 prosody has come from speech technology, and technological advances have provided a range of tools to assist teachers and learners in the development of pronunciation skills in a variety of target languages. These tools include commercially available computer systems, web-based systems, and various software programs ranging from those requiring some specialized knowledge to those suitable for the non-specialist. Research to date has suggested that computer-based visual displays of some areas of speech production, such as pitch and intonation contours, are user-friendly and valuable sources of feedback in the learning process. Increasingly, more individuals are able to avail themselves of computer-based tools to practice the sounds of a new language that may not exist in their immediate environment (for a review of Computer Aided Pronunciation Teaching, see Busà, 2007).

One of the objects of the present study was to ascertain whether it is possible for Italian speakers to improve their prosody in English after appropriate feedback. For this purpose, the same speakers who served as subjects of the preliminary investigation reported above were asked to use *Praat* to compare their utterances with the native speakers', get audio-visual feedback on their own productions, and try to produce more native-like prosodic patterns after a short practice session (of about 30 minutes). Even though the practice session was short, it did prove effective in bringing about an improvement of the students' productions. Figure 14 shows the visualization of the utterance 'Bye!' as pronounced by the same speaker who spoke the utterance in Figure 10 (here shown as Fig. 13), after she had received audio-visual feedback through the use of *Praat.* The comparison of Figures 13 and 14 shows the speaker's clear improvement in both pitch contour and vowel duration. These results are in agreement with previous studies which have discussed the usefulness of providing students with audio-visual feedback to get an improvement in prosodic patterns (Anderson-Hsieh, 1992, 1996; Chun, 1998, 2002; Knowles et al., 1996;

Mennen, 1998; Molholt, 1988; Neri et al. 2002; Spaai and Hermes, 1993; also reviewed in Busà, 2007; Pickering 2006).
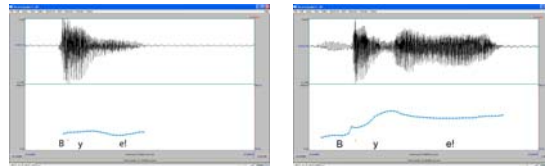

Fig. 13 and 14: The utterance 'Bye! Spoken by an Italian speaker *before* (Fig. 13) and *after* (Fig. 14) audio visual feedback

7. Conclusions

In communication, a large amount of linguistic and paralinguistic information is conveyed through prosody. Discussing issues of communication in English as a Global Language requires addressing the issue of how meaning is exchanged – through prosody – between native and non-native speakers, and between non-native speakers among themselves. Both native and non-native speakers may be at a loss when faced with the task of using or interpreting prosodic patterns that are used differently from the native language patterns. Prosodic information may also be processed differently by native and non-native speakers because of their different level of competence in English. For example, as suggested by Jenkins (2002), non-native speakers may rely more on segmental, as opposed to prosodic, information to get their meaning across, given the fact that they lack the amount of extra-linguistic knowledge that native speakers can rely on when communicating.

The amount of research that is being conducted on contrastive English L1 and L2 prosody, from both a theoretical and an applied perspective, is increasing. As research on L1-L2 prosody progresses, we are gaining a better understanding of how communication in English between people with different linguistic backgrounds works and what hinders it. However, while the concept of 'successful communication' has

gained wide acceptance in theoretical and applied studies of Global English, we are still far from a univocal and objective definition of some key concepts on which successful communication rests, such as *foreign accent*, *intelligibility*, *comprehensibility*, etc. More investigations are needed to study the effects of L1 on L2 speakers' production and perception mechanisms, the perception and intelligibility of L2 speech, and interaction dynamics of native and nonnative speakers. Besides furthering our understanding of communication in multicultural and multilingual settings, these studies will also provide us with valuable data for our teaching methods and materials.

In this perspective, the pilot study reported in this chapter was aimed at gathering data on the effects of Italian prosody in English. Though still preliminary, the results indicate that the number and magnitude of the differences in prosody between native English and Italian-accented English is such that Italian prosody in English is bound to have an effect on the Italian speakers' intelligibility and successful communication in English. In particular, because spoken English relies on an alternation of prominent vs. non-prominent elements in the sentence to mark discourse information structure, a major problem may be represented by the Italians' inability to distinguish, at a phonological level, between salient vs. non-salient information, i.e., by not making syllables prominent through stress, duration or pitch. At a pragmatic, paralinguistic level, the relative *flat* and unvaried contours of Italian intonation in English may also affect the overall social *perception* of the native Italian speakers, by affecting their perceived emotional or propositional involvement in the utterance, e.g., by making them sound boring or detached. More data are needed to confirm these first observations.

This study also provides preliminary data suggesting that Italian prosody in English can be effectively improved with the aid of audio-visual feedback, as obtained through the use of speech-analysis software. While this study needs to be carried out in a more systematic way and on a much wider speech sample, its indications are in line with previous reports on the usefulness of audio-visual feedback in pronunciation teaching.

From the wider perspective of English as a Global Language, it may be of interest to study whether the prosodic patterns observed in the English spoken by Italian native speakers show similarities with the English spoken by other syllable-timed language speakers.

Specifically, the observed lack of differentiation in duration and pitch between stressed and unstressed syllables in the Italian speakers' utterances is possibly the result of rhythmic production mechanisms that are syllable-timed rather than stress-timed. Similar mechanisms may well be at work when speakers of other syllable-timed languages speak English.

It has been claimed that English speakers of syllable-timed languages greatly outnumber English speakers of stress-timed languages and that, as a result, "there is a syllable-timed English emerging all over the world" (Crystal, 1994: 177; but see also Crystal 2000). If this is true, varieties of English worldwide will undergo changes in their phonological systems involving vowel quality and duration as well as nuclear stress, sentence pitch prominence and intonation. Perceptually, this may result in a different way of cueing salient information in discourse, to which even English native speakers may have to adjust in interactions with non-native speakers. Paralinguistically too, the lack of adherence to English prosody may no longer be associated with certain particular emotions, attitudes, social stigmas (Ramirez Verdugo, 2005). However, though studies have started to appear on English as a syllable-timed language (e.g., Holmes and Ainsworth, 1997; Jian, 2004; Ling et al., 2000) more empirical data are needed in this research domain to discuss whether it is possible to talk about the development of a new rhythmical dimension and prosody for English as a world language.

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