

# The Italian accent in English. Results from an experimental study and implications for language teaching

Maria Grazia Busà  
Università di Bologna

## 1. Introduction

Much of the literature on pronunciation teaching is concerned with establishing pronunciation standards or norms (for example, which variety/varieties of English should be the object of our teaching), or defining the nature of learners' errors and developing ways of improving and reducing them. This paper is concerned with the second issue and addresses the question of what causes a foreign accent, how it affects intelligibility and communication, etc. The results of an experimental study designed to investigate the major correlates of the Italian accent in English are presented and discussed in terms of their relevance to pronunciation teaching.

### 1.1. Foreign accent and intelligibility

What exactly do we mean by *foreign accent* and what are its effects on speech perception by native listeners? Accented speech may be regarded as speech that deviates in various ways from native speaker norms. The deviations may include phone substitutions, phonetic distortions, and non-native prosodic patterns. Which of the above plays a greater role in the perception of foreign accent is still debated. The degree of perceived accent may be directly correlated to the number of phone substitutions detectable (Ryan *et al.* 1977). It seems however, that not all substitutions or deviations contribute equally to the perception of foreign accent (Brennan and Brennan 1981). The degree of expectation of certain phonetic norms seems to play a major role in judgements of accents, since the human ear learns easily to ignore or 'convert' deviations that it can predict or expect (Gibson 1969). So, the perception of foreign accent may be related to the fact that non-native productions are less predictable, due to differences in the L1 and L2 phonetic/phonological systems, or that the phone substitutions are less systematic.

The question of foreign accent is connected to that of *intelligibility*. Intelligibility can be defined as the degree to which a speaker's message is understood by a listener, though no universal way of assessing it has yet been

established. Intelligibility seems to be a function of the degree of exposure, such that increasing familiarity with (a particular kind of) accented speech improves the understanding of it. As an effect, a listener's understanding of a message can be unrelated to the degree of accentedness of the message. Listeners seem to be accurate perceivers of degree of accent, but accentedness ratings can be quite independent of judgements of intelligibility. A study by Munro and Derwing (1995a), for example, shows that listeners have no hesitation assigning high accentedness scores to non-native speech that in fact they have no problems understanding and comprehending.

Non-native like pronunciation does seem to interfere with intelligibility, though the relation between the two is far from clear. It is still debated, for example, whether intelligibility is more affected by errors in pronunciation or in other linguistic domains, such as grammar, lexicon, etc. (Gynan 1985; Albrechtsen *et al.* 1980; Fayer and Krasinski 1987). Also, it still remains unclear which specific aspects of pronunciation are most crucial for intelligibility. For example, it has not been conclusively shown whether it is errors at the segmental or suprasegmental level that are more likely to affect intelligibility and comprehensibility. However, it can be hypothesized that some deviations are more severe, and result in an unintelligible or partially unintelligible message, others may have the effect of requiring a greater degree of effort for the listener to understand the message, and others still may simply be heard as slightly deviant but have hardly any effect on intelligibility. Thus, the listener's understanding of the message may be affected by the accented speaker's partial or complete altering of segments, words, or larger units, to a degree that is related to the the amount and extent of the alterations.

A probable reason for the correlation between presence of accent and reduced intelligibility has to do with the way accented speech is processed. Common experience suggests that focussing attention on the comprehension of single chunks of speech has an effect on the comprehension of the discourse as a whole. This, again, may be related to the degree of deviation of the segments produced, as well as the extent to which larger units such as syllables, words, entire phrases, etc., get distorted. A study by Munro and Derwing (1995b) designed to investigate the 'costs' of having a foreign accent (in terms of comprehensibility and processing times) showed that full comprehension may be blocked because of the presence of a foreign accent in about 5-10% of the cases. A much more relevant effect is that in most cases a foreign accent requires a longer time to process than non-accented speech. When evaluating the comprehensibility of non-native speech, listeners take long processing time into consideration and tend to identify this dimension with incomprehensibility.

The longer processing time required to understand accented speech may be at the basis of another common effect of foreign accent on communication, and that

is attitudes such as irritation, impatience or intolerance which may arise in the presence of an accent. For example, it has been shown that speakers may be discriminated, or prejudiced, or treated as outsiders of a group/community on the basis of their accented speech (Albrechtsen *et al.* 1980; Brennan and Brennan 1981; Cunningham-Andersson 1993; Fayer and Krasinski 1987; Gumperz 1982; Gynan 1985; Labov 1966).

At the same time, English is an international language and interactions in English with/among non-native speakers are as frequent or even outnumber those that involve native speakers. This may well have implications for the concepts that have been discussed so far. For example, it may have an effect on what speakers and listeners consider to be the 'norm' and on the extent to which variation or deviation from it is tolerated, and so affect speakers' and listeners' attitudes towards accented speech. Also, it may call for a redefinition of the concept of intelligibility itself. It is sometimes easier for foreigners to understand each others' speech than the speech of native speakers. This does not mean that accented speech is more understandable than native produced speech, but could rather be explained by the fact that non-native speakers from different language backgrounds may not be applying correctly some English phonological processes, for example, vowel reduction.

## 1.2. Foreign accent and pronunciation teaching

Though many questions on foreign accent are still unanswered, reduction of accent is likely to entail increased intelligibility, better functioning in the language, and, on the whole, improved communication skills. If, as language teachers, improved communicative competence is among our primary goals, we should be able to identify which areas in our learners' production represent a greater pronunciation problem and most affect learners' comprehensibility and intelligibility. We could thus focus on specific problems rather than addressing global accent reduction, at least at the early stages.

At present little empirical evidence indicates which particular aspects of the Italian accent in English are most detrimental to comprehensibility and intelligibility. Data on the acquisition of the sound system of L2 can help the teacher to work out an appropriate pronunciation course syllabus, suited to the students' needs, and taking into account the degree of approximation to the target norm which the teacher can aim at.

## 2. The present study

In this paper I will report some of the results of an investigation on the main cues of the Italian accent in English, conducted using the methodology and techniques of experimental phonetics. This study was designed to test whether faulty vowel production by Italian speakers of English is a crucial cue in the detection of accent by native English speakers and whether degrees of deviation or 'distance' from native-like vowel production correlate with perceived degree of Italian accent in English. Adult speakers' ability to establish new phonetic/phonological categories for L2 that are not present in L1 was also tested in the experiment.

To formulate a working hypothesis as to what may be a cause of difficulty (and therefore perceptual and production accent) for an Italian speaker of English L2, I first compared the Italian and the English phonological and phonetic systems. Italian and English differ in many important ways, both at the segmental and the suprasegmental level. At the segmental level, there are differences in the consonant (manner, place of articulation, etc.) as well as vowel (quality, duration, etc.) production. At the suprasegmental level, there are differences in rhythm, due to differences in stress patterns, syllabic structures, vowel reduction phenomena, durational variations, coarticulation processes, etc. Finally, there are differences in intonation.

My hypothesis was that one of the main pronunciation problems for an Italian speaker of English is related to rhythm. Vowel production plays a major role in the creation of English rhythmic tendencies and thus seemed a good starting point for the analysis. Several features contribute to the differences in rhythm in the two languages. Italian has a 7 vowel system, and no phonological vowel reduction processes. Italian syllable structure is mainly of the CV type with strong restrictions on the consonants which can occur in word-final position (only liquids and sonorants, if we exclude acronyms and borrowings from other languages). Vowel duration is rather stable regardless of the position of the vowel in the word or the sentence (Farnetani and Kori 1990); duration is the main correlate of word stress in Italian, and in stressed position there is a strong contrast between long vowels in open syllables and short vowels in closed syllables (Fava and Magno Caldognetto 1974; Farnetani and Kori 1982; Vayra *et al.* 1984).

Compared to Italian, English has a larger vowel inventory (around 11-13 vowel phonemes, depending on the variety of English considered), with sets of oppositions of tense and lax vowels, the latter being inherently shorter, lower and slightly more centralized than the corresponding tense vowels (Ladefoged 1975). English also displays a wider variety of syllable types, allowing complex syllable onsets and codas, and almost any consonant in its inventory can occur in

word final position. The difference between stress vs nonstress is signalled by the cooccurrence of a number of factors such as vowel quality, presence vs absence of vowel reduction phenomena, concentration of higher level prosodic features in stressed syllables, etc. (Dauer 1983, Bertinetto 1988). English vowel duration is affected by consonantal environment (for example in the context of following voiced vs voiceless consonants), position in the word and the phrase (prepausal lengthening), intonation, etc. (Klatt 1976).

The experiment was designed to investigate the weight given, by native Italian speakers, to the spectral and temporal parameters working in English to create vowel contrasts, and to see if and how, Italians create spectral differences non existing in their L1. To this purpose, the experiment analyzed the productions of native speakers of American English and Italian of the following American English vowels: /i/, /ɪ/, /e/, /ɛ/, /æ/, /ʌ/, /ɑ/, /o/, /ʊ/, /u/. The vowels /ɒ/ and /ɔ/ were omitted as they are not distinguished from /ɑ/ in the Californian variety of American English spoken by the subjects of this experiment (Ladefoged: 1975). The vowels were contained in the following English words: 'keep', 'skip', 'cape', 'kept', 'cap', 'cup', 'cop', 'cope', 'scoop', 'foot' and 'food'. The choice of the last two words, forming a subminimal pair, is due to the fact that, for historical reasons, in English there is no minimal word pair contrasting the two high back vowels /u/ and /ʊ/. Each word was presented for the subjects to read in two different phrase contexts, i.e., in emphatic phrase final and semifinal position (for ex., "I didn't say cup, I said *cap*" and "Talia broke her mug and Debrah cracked her *cap*, too"). The purpose of having two different phrasal contexts was to analyze vowel production and possible occurrence of vowel reduction phenomena in two different sentence stress conditions. The order of presentation of the sentences was random.

The subjects were 7 Americans from North California, and 19 Italians, born and raised in Northern Italy but having lived in North California for various periods of time, and subdivided, on the basis of 90 ratings on a 1-to-5 scale by native American English speakers, into: light-accented Italians (Italians 1; 5 subjects); medium-accented Italians (Italians 2; 7 subjects); heavy-accented Italians (Italians 3; 7 subjects). All the 26 subjects had university level education and the Italians used English in their studies, at work and sometimes at home. All the Italian speakers had studied English in secondary and/or high school and none had received instructions in English phonetics/pronunciation.

The recordings took place in a sound insulated room under high quality conditions, using the equipment of the Phonology Laboratory at the University of California, Berkeley. The data were sampled at 10kHz and the vowels were analyzed using the Unice software at the Centro di Studi per le Ricerche di Fonetica del C.N.R. in Padova. For each vowel under study, the frequency values of the first and second formants (F1 and F2) – which have been shown by

experimental work to provide enough information to define vowel quality – were computed from LPC spectra. The vowel durations were also measured from the spectrograms. The data were tested for statistical significance with between-group and within-group ANOVA's.<sup>1</sup> In this paper, only the averaged values of the vowel occurrences in the two phrasal contexts are presented.

### 3. Results of the analysis

#### 3.1. Comparison of the vowel systems produced by the four groups of speakers

The data represented in Fig. 1 (taken from Ferrero 1992) show the Italian vowel space as produced by native Italian speakers – the chart should be read by turning the page 45 degrees to the left to allow a comparison with the traditional vowel chart. It appears that the Italian vowels are distributed in a triangular space, and do not overlap with each other.

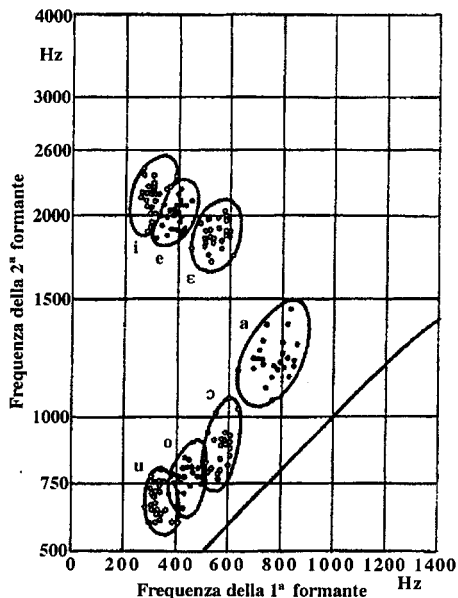


Fig. 1. The Italian vowel space (taken from Ferrero 1992)

<sup>1</sup> Given the descriptive nature of the data presentation in this paper, the results of the statistical tests are omitted here. For further details on the statistics data, as well as other information on the experimental procedure, see Busà (1995).

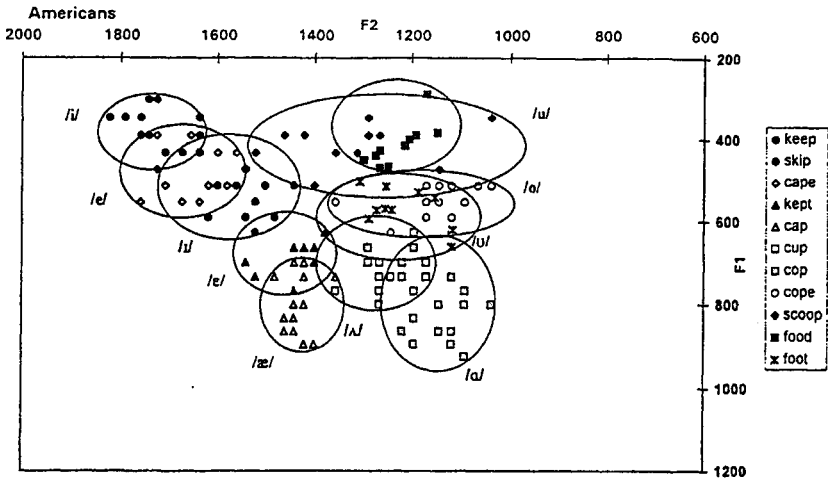


Fig. 2. F1-F2 chart (in Mel) of the vowel space of the American subjects

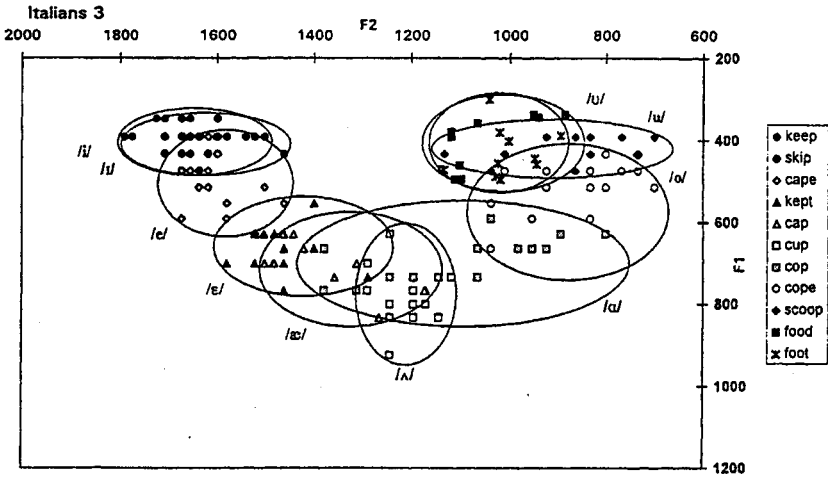


Fig. 3. F1-F2 chart (in Mel) of the vowel space of the heavy-accented Italians





charts. For the representation of the vowels, the F1 and F2 values were converted in  $\text{mel}^2$  using the formula given by Fant (1973).

The American vowel system has the expected trapezium shape. Fig. 2 shows the position of all the vowels in the whole vowel space and in relation to each other. The figure also shows that there is a conspicuous degree of overlap in the production of the vowels. This is due to the strong centralization that the vowels produced in actual speech undergo to, i.e., there is a clear tendency for all vowels to be reduced and produced towards the center (so that they acquire a schwa-like quality), particularly when they occur in an unstressed position in the sentence – here the more centralized vowels are the ones that occur in phrase non-final position (see Busà: 1995). The chart shows the features by which the vowels get differentiated. For example, /i/ and /ɪ/ are distinguished by both height and degree of fronting (i.e., /i/ is higher and more fronted than /ɪ/ in the vowel space). The vowel /ɪ/ partially overlaps with /e/, but the former gets more centralized. /u/ and /ʊ/ are distinguished only by degree of height, and /ʊ/ largely overlaps with /o/. Both the diphthongized vowels /e/ and /o/ are located in a space that is intermediate between that of the corresponding high front (i.e., /i/ and /ɪ/) and back (i.e., /u/ and /ʊ/) vowels (in agreement with Ladefoged *et al.* 1978). The high back vowels tend to be very centralized, particularly /u/ for which centralization corresponds to a very high degree of fronting (see 'scoop'). Of the other vowels, /e/ and /æ/ are differentiated by both height and fronting, and so are /æ/ and /ʌ/ and /ɔ/ and /ɑ/, while /ɛ/ and /ʌ/ and /æ/ and /ɑ/ have about the same height but are distinguished by degree of fronting.

The vowel system of the heavy-accented Italians (Fig. 3) indicates that these speakers are producing vowels that, both at the phonological and the phonetic level, are very unlike the target and resemble closely the vowels in their L1 system (Fig. 1). The vowels are arranged in a triangular space. This can be seen particularly in the lower part of the space where there is no distinction between front and back vowels. Also, major distinctions that are crucial in the target vowel system and that have the important function of differentiating minimal pairs in the target language are missing. The data indicate that the speakers assign (Italian) vowel sounds to the target vowels in a rather random fashion, which may be partly due to the often misleading sound-to-symbol relationship of English spelling. Particularly in the case of the vowels in the words 'cap', 'cup', and 'cop', the productions of the Italians 3 range fairly unsystematically within a large variety of Italian low to mid low vowels, including /ɛ/, /a/, /ɔ/ and /o/.

- 
- 2 Mel is a unit which reflects the human ear's sensitivity to differences in pitch. "It is derived from numerous psychophysical experiments in which subjects were asked to perform tasks such as deciding when one tone was half the pitch of another, and when one tone was midway in pitch between two others" (Ladefoged 1996).

The two contrasting vowel pairs /i/ and /ɪ/, /u/ and /ʊ/ are also undifferentiated (they are completely overlapping in the vowel space), and both members of the pairs are realized as /i/ and /u/ respectively. At a more strictly phonetic level, it can be observed that all the vowels produced by the Italians 3 are pronounced more back than the English vowels (their values in mel tend to be lower), particularly so in the case of the back vowels (with F2 values starting from around 650 mel against the 1000 mel of the American vowels). This is explained by the fact that the Californian back vowels are pronounced with reduced lip rounding, while the Italian back vowels are fully rounded. It is noticeable, again, that the central schwa-like area of the chart is empty, a sign that the speakers are not centralizing their vowels in their speech. Central or centralized vowels are in fact absent in the phonological systems of Italian.

It is obvious that the heavy-accented Italians' speech must be auditorily confusing, and give rise to frequent misunderstandings or miscomprehensions, especially due to the speakers' inability to make any functional differentiation of the vowel sounds.

Fig. 4 shows the vowel system of the medium-accented Italians. The chart shows that the Italians 2 have improved quite remarkably from the most typical Italian productions represented by the Italians 3. The most noticeable difference is the redistribution of the vowel phonemes in a space that is approaching the shape of the target vowel system. This is clear looking at the whole area of the system, extending to values and in directions that are no longer typically Italian. The data also show that the speakers have perceived the target vowel contrasts and are trying to create at least minimal distinctions in their L2 vowel system, mainly by expanding the areas of their L1 sounds. This occurs particularly where the contrasts are functional in the L2. The production of the two high front and back vowel pairs is a good example. While /u/ and /ʊ/ are still largely indistinguished, as this distinction is not functional in English, there is a clear attempt to distinguish /i/ and /ɪ/, which play a role in differentiating many English minimal pairs. In particular, /ɪ/ has been perceived to be lower than /i/, and though /ɪ/ is still produced like /i/ a lot of the times, the speakers are trying to produce a new lower sound by using the lower instances of /i/ or replacing it with the next available Italian vowel sound, i.e., /e/. In some instances, the substitution of /ɪ/ with /e/ may not be too deviant from the model (compare Fig. 2). Another vowel created by extending the productions of a neighboring Italian sound is /æ/, obtained by lowering part of the productions for /ɛ/. Finally, the front vowels have been distinguished from the back vowels. Sounds in the area of the Italian /a/'s and /ɔ/'s have been reserved for the productions of the /ʌ/ and /ɑ/ sounds in 'cup' and 'cop' respectively. Thus, the quasi-random assignment of L1 sounds to target vowels which was a characteristic feature of the previous group is no longer present. From a phonetic point of view, the

vowel system appears to be produced less back than in the previous level (with F2 values starting from around 750 mel for the back vowels). The speakers seem to have perceived part of the phonetic details of the target system. However, there is little occurrence of vowel centralization, i.e., the vowels are still produced in a rather stable/unreduced way. This indicates that the speakers have not yet acquired the ability to shift from more to less centralized variants, depending on phrasal context, sentence stress, etc.

Interestingly, these speakers sounded very heavily accented to me when I heard them. Yet, when native speakers were asked to comment on the intelligibility of this group, they reported no trouble understanding these subjects, and this is probably the reason why they received a higher score than the speakers in the preceding group. This confirms that native speakers are accurate perceivers of foreign accent and that judgements of accent may be related to the degree to which a speaker's speech is understandable. Also, reduction of accent may be characterized by the production of minimal contrasts/distinctions, occurring once the awareness of their function in L2 has been reached. It can be assumed that the progress made by this group results in a considerable improvement in general communication skills which is probably a consequence of a greater experience with the language than the speakers in the previous group have.

Finally, the data of the Italians 1 are shown in Fig. 5. This system clearly resembles the target. The light-accented Italians' vowel space appears to have all the target-like characteristics which are likely to ensure good distinctiveness to the individual sounds. The trends which were shown by the preceding group have been continued and improved. The redistribution of the whole vowel space has been worked out to a greater precision. All the vowels have been discriminated, if possible on the same dimensions as in the target, if not, at least on one dimension. /i/ and /ɪ/ are completely discriminated, and both in height and degree of fronting as in the model. /u/ and /ʊ/ are much less clearly discriminated, with /ʊ/ being lower than /u/, though only some of the time. In the lower part of the diagram, /ɛ/ has been distinguished from /æ/, though this distinction is achieved more on the front dimension, than on both height and fronting as in the model. The vowel /ʌ/ has been raised towards the center and /a/ slightly advanced for better resemblance with the model. Phonetically, the general frontedness of the system has been perceived and these speakers produce all back vowels with a higher degree of fronting than the speakers in the preceding group. The Italians 1 have also perceived the tendency to vowel centralization in the model, and appear to be able to produce centralized variants where these occur in English, thus showing acquisition of phrasal context-related variational patterns (Busà 1995).

Overall, the analysis of the formant frequency values for the four groups indicates that moving from the productions of the heavy-accented Italians to the light accented ones there is a clear shift from a vowel system that is typically

Italian to one that is very close to the American English model. The reduction of accent seems to be paralleled by a progression from a system with no phonemic vowel contrasts to a system where all the important vowel distinctions and major production details are achieved.

### 3.2. Durational patterns in vowel production

As mentioned above, vowels in English are distinguished not only by quality but also by duration. Vowel durational distinctions tend to be maintained in stressed or emphatic position but are neutralized in continuous speech, due to vowel reduction processes (Klatt 1976). In Italian, on the other hand, vowels present less conspicuous differences with regard to duration, and in speech they are less subjected than English vowels to reduction processes. Italian vowel duration patterns are likely to affect native Italian speakers' treatment of English vowel duration, with an effect on perceptual rhythmic tendencies. Our Italian speakers' treatment of English vowel duration can be exemplified by looking at the duration of the vowels in the minimal pair 'keep' and 'skip' and the subminimal pair 'food' and 'foot'. These data are shown in Table 1.

words	vowel	Am	It. 1	It. 2	It. 3
keep	/i/	105	139	137	106
skip	/i/	95	101	81	94
scoop	/u/	105	140	129	127
food	/u/	169	184	145	116
foot	/u/	108	105	108	104

*Table 1.* Average duration in ms. of the vowels /i/ and /i/ in the words 'keep' and 'skip', and of the vowels /u/ and /u/ in the words 'scoop', 'food' and 'foot' respectively, as produced by the four groups of speakers.

In the speech of the Americans, the two high front vowels /i/ and /i/ present a not very relevant difference of 10 ms, their values being 105 and 95 ms respectively. The Italians with a heavy accent have values of duration that are similar to the respective targets in both cases, that is, they have a longer vowel in 'keep' (106 ms) than in 'skip' (94 ms). The fact that this group is not distinguishing the two vowels by quality (Fig. 3) reveals a greater sensitivity to durational than qualitative variations in the L2. The Italians 2 have accentuated the contrast in duration, both with respect to the target vowels and the previous level, by increasing the duration of /i/ (which is now 137 ms long) and decreasing the duration of /i/ (which is now 81 ms long). In other words, they

have hyperdifferentiated the two vowel durations. This process is evidence, again, that the speakers are trying to create some distinction between the two vowels in terms of duration rather than quality, as they are unable, or only partially able, to differentiate the two vowels in their quality (Fig. 4). Finally, the Italians with a light accent, who have managed to distinguish the quality of the two vowels, reduce the excessive durational difference between the two vowels which is found in the previous level, yet still hyperdifferentiate the duration contrast of the two vowels by producing a hyperlong /i/ (139 ms long).

The tendency to hyperdifferentiation in duration may be interpreted as a compensatory strategy for the Italian speakers to reinterpret the L2 vowel quality difference in terms of duration. Contrasting /i/ and /ɪ/ mainly, or solely, by length, may be rooted in the partially inaccurate tradition, still frequently in use in English language and pronunciation textbooks, to refer to /i/ as longer than /ɪ/. The orthographic representations of these two sounds too may be misleading to the English non-native speakers.

The treatment of duration in the other vowel pair examined here, i.e., /u/ and /ʊ/, shows that the same strategy is at work. In English, /u/ and /ʊ/ have tendentially the same duration value if they occur in a similar postvocalic context. What creates a durational contrast is the occurrence of a postvocalic voiced consonant, which causes the duration of the preceding vowel to lengthen quite conspicuously. Though some lengthening before voiced consonants is common across world languages, in English this feature has almost reached a phonological status. In Italian, on the other hand, /u/ duration is not affected by the voicing of the following consonant (Ferrero *et al.* 1978).

Looking at the English vowels, the data confirm the expectations: the vowels in the words 'foot' (/ʊ/) and 'scoop' (/u/), both preceding a voiceless consonant, have similar duration values, i.e., 105 and 108 ms respectively; the vowel /u/, in

---

3 For example, this is how Baker, A., 1992, *Introducing English pronunciation. A teacher's guide to Tree or Three? and Ship or Sheep?*, Cambridge: C.U.P. talks about the distinction between /i/ and /ɪ/:

*/i/*: - **Sound production**: Open your mouth very little to make the sound i:. i: is a very long sound, although it is shorter before unvoiced consonants. - **Student difficulties**: Most students do not have difficulties with this sound, although some students, [...], do not make it long enough and may confuse it with I. [...]. (p. 23)

*/ɪ/*: - **Sound production**: First practise the sound i:. Then open your mouth a little more. i: is a long sound. I is a short sound. - **Student difficulties**: This sound occurs very frequently in the beginner's vocabulary range and nearly all students have difficulty with it, confusing it with i:. [...]. When practising the two sounds i: and I in isolation, knowing that I is a much shorter, quieter sound than i: seems to help students. [...]. (p. 25)

A similar treatment is given in the same text for the vowels /u/ and /ʊ/.

'food' is 169 ms long. For the three groups of Italians, on the other hand, the vowel /u/ has values which are similar to both the target /u/ and the Italian /u/ (it is 104 ms for the It. 3; 108 ms for the It. 2; and 105 ms for the It. 1). With regard to the vowels /u/ in 'scoop' and 'food', on the other hand, the three groups behave differently from each other and from the Americans. The heavy accented Italians have longer durations in /u/ than in /u/, which shows that the speakers produce a durational contrast between these two vowels. However, they produce a longer /u/ in 'scoop' (127 ms) than in 'food' (116 ms), which shows that they have not acquired the English rule of vowel lengthening before voiced consonant. Italians 2 also have longer /u/'s than /u/'s, which shows, again, that the speakers are unable to differentiate the two vowels in terms of quality and try to distinguish them by means of duration. This group has a better perception of the American pattern than the Italians 3, as they produce a longer vowel in 'food' (145 ms) than in 'scoop' (129 ms). However, though there is a considerable improvement from the previous level, the Italians 2 still fall short of the American values. The tendency to hypercorrecting the /u/ vowel duration is continued at the advanced level represented by the Italians 1: the duration of the vowels in 'scoop' and 'food' produced by this group is increased with respect to the previous group, giving rise to hyperlong /u/'s (140 ms in 'scoop' and 189 ms in 'food').

To summarize the indications from the durational data, there is a clear tendency for the Italian speakers to resort to duration to produce a vowel contrast which has been perceived to exist in L2 and is absent in L1, but which the speakers have difficulties in producing in terms of quality. This tendency seems to lead to strong hypercorrections.

#### 4. Conclusions

Discussions on the effects of foreign accent on intelligibility point to the importance of identifying which aspects of pronunciation may have the strongest impact on communication. More research needs to be done to be able to design tailored course objectives for the Italian students of English pronunciation. Vowel production and vowel-related phenomena are a source of difficulty for the Italian speaker of English and may be a source of problems for the listener. The results of the investigation reported in this paper have shown that there is a correlation between perceived degree of accent in English by native speakers and the Italian subjects' degrees of approximation to the target vowel system. The three levels of approximation to the target vowel systems can be taken to represent different stages in the acquisition of the English vowel phonology and phonetics. Since all of the Italian subjects have come in contact with English as adults, the data also show that acquisition of L2 phonetic features is possible for

adult L2 learners, who appear to be able to perceive and create distinctions which are functional in L2 and absent in L1. As pronunciation teachers, we can speed up the process of acquisition of non-native phonological and phonetic features by helping students to perceive and create distinctions that they are initially unaware of. There is evidence that the English vowel acquisition process by Italian native speakers is characterized by a certain amount of hypercorrections, particularly in the temporal domain. In fact, the Italian speakers seem to be more sensitive to differences in vowel duration than in vowel quality, which shows up as a tendency to reproduce vowel quality distinctions found in L2 but not in L1 as differences in vowel duration. This calls for a word of caution in the use of many English pronunciation textbooks, which emphasize the difference in duration between the so-called tense and lax vowels pairs. The difference in duration between vowel pairs should rather be minimized, since, in any case, it does get neutralized in actual speech in unstressed condition.

We do not know how the Italians' linguistic behaviour affects speech comprehension by native speakers. If, as it seems from the literature, English native speakers rely more on the auditory effects of vowel quality than on the auditory effects of duration, then the strategy used by the Italians and exemplified in my data may have effects on the intelligibility of Italian-accented English. In any case, pronunciation teaching should pay more attention to the improvement of rhythmic patterns in L2. Focussing on stress assignment at the sentence level would be a good way to point out differences between the English and the Italian rhythmic patterns, as well as differences in vowel production.

#### References

- Albrechtsen D., Henricksen B. and Faerch C., 1980, "Native speaker reactions to learners' spoken interlanguage", *Language Learning*, 30, pp. 365-396.
- Bertinetto P.M., 1988, "Reflections on the dichotomy 'stress' vs. 'syllable-timing'", *Quaderni del Laboratorio di Linguistica*, 2, Scuola Normale Superiore, Pisa, pp. 59-84.
- Brennan E. and Brennan J., 1981, "Measurements of accent and attitudes towards Mexican American speech", *Journal of Psycholinguistic Research*, 10, pp. 487-501.
- Busà M.G., 1992, "On the production of English vowels by Italian speakers with different degrees of accent", in *Proceedings of New Sounds '92*, Amsterdam, 13-16 april, pp. 47-63.
- Busà M.G., 1995, *L'inglese degli Italiani. L'acquisizione delle vocali*, Unipress, Padova.
- Cunningham-Andersson U., 1993, "Stigmatized pronunciations in non-native Swedish", *Perilus*, 17, pp. 81-106.

- Dauer R.M., 1983, "Stress-timing and syllable-timing reanalyzed", *Journal of Phonetics*, 11, 1, pp. 51-62.
- Fant G., 1973, *Speech sounds and features*, the MIT Press, Cambridge Mass.
- Farnetani E. and Kori S., 1982, "Lexical stress in spoken sentences: A study on duration and vowel formant pattern", *Quaderni del Centro di Studi per le Ricerche di Fonetica*, 1, pp. 106-133.
- Farnetani E. and Kori S., 1990, "Rhythmic structure in Italian noun phrases: a study on vowel durations", *Phonetica*, 47, pp. 55-65.
- Fayer J.M. and Krasinski E., 1987, "Native and nonnative judgements of intelligibility and irritation", *Language Learning*, 37, pp. 313-326.
- Fava E. and Magno Caldognetto E., 1974, "Studio sperimentale delle caratteristiche elettroacustiche delle vocali toniche e atone in bisillabi italiani", AA. VV. *Studi di fonetica e fonologia*, Bulzoni, Roma, pp. 35-80.
- Ferrero F., Magno Caldognetto E., Vagges K. and Lavagnoli C., 1978, "Some acoustic characteristics of the Italian vowels", *Journal of Italian Linguistics*, 3, pp. 87-95.
- Gibson E., 1969, *Principles of perceptual learning and development*, Appleton-Century Crofts, New York.
- Gumperz J., 1982, *Discourse Strategies*, Cambridge University Press, Cambridge.
- Gynan S., 1985, "Comprehension, irritation and error hierarchies", *Hispania*, 68, pp. 160-165.
- Klatt D.H., 1976, "Linguistic uses of segmental duration in English: Acoustic and perceptual Evidence", *Journal of the Acoustical Society of America*, 59, pp. 1208-1221.
- Labov W., 1966, *The social stratification of English in New York City*, Center for applied linguistics, Washington D.C.
- Ladefoged P., 1975, *A Course in phonetics*, Harcourt Brace Jovanovich, New York.
- Ladefoged P., 1996, *Elements of acoustic phonetics*, 2ed., The University of Chicago Press, Chicago.
- Ladefoged P., Harshman R., Goldstein L. and Rice L., 1978, "Generating vocal tract shapes from formant frequencies", *Journal of the Acoustical Society of America*, 64, pp. 1027-1035.
- Munro M.J. and Derwing T., 1995a, "Foreign accent, comprehensibility, and intelligibility in the speech of second language learners", *Language Learning*, 45, 1, pp. 73-97.
- Munro M.J. and Derwing T., 1995b, "Processing time, accent, and comprehensibility in the perception of native and foreign-accented speech", *Language and Speech*, 38, 3, pp. 289-306.



- Ryan E., Caramazza M. and Moffie R., 1977, "Reactions towards varying degrees of accentedness in the speech of Spanish-English bilinguals", *Language and Speech*, 20, pp. 267-273.
- Vayra M., Avesani C. and Fowler C., 1984, "Patterns of temporal compression in spoken Italian", *Proceedings of the Xth International Congress of the Phonetic Sciences*, Foris Publications, Dordrecht, pp. 80-95.