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THE ACQUISITION OF ENGLISH L2 PROSODY BY ITALIAN NATIVE SPEAKERS: EXPERIMENTAL DATA AND PEDAGOGICAL IMPLICATIONS

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This paper investigates Yes-No question intonation patterns in English L2, Italian L1, and English L1. The aim is to test the hypothesis that L2 learners may show different acquisition strategies for different dimensions of intonation, and particularly the phonological and phonetic components. The study analyses the nuclear intonation contours of 4 target English words and 4 comparable Italian words consisting of sonorant segments, stressed on the semi-final or final syllable, and occurring in Yes-No questions in sentence-final position (e.g., *Will you attend the **memorial**?*, *Hai sentito la **Melania**?*). The words were contained in mini-dialogues of question-answer pairs, and read 5 times by 4 Italian speakers (Padova area, North-East Italy) and 3 English female speakers (London area, UK). The results show that: 1) different intonation patterns may be used to realize the same grammatical function; 2) different developmental processes are at work, including transfer of L1 categories and the acquisition of L2 phonological categories. These results suggest that the phonetic dimension of L2 intonation may be more difficult to learn than the phonological one.

INTRODUCTION

Prosody, that is, the variations in rhythm, stress, pitch, and intonation patterns occurring during speech, has an important function in language and communication. It is used to signal emphasis, disambiguate sentences, contextualize meaning, as well as convey emotions and attitudes.

L2 speakers' prosody is likely to be heavily influenced by the L1, with effects on L2 production and perception. In fact, L2 prosodic production has been shown to contribute to what is perceived as 'foreign accent', and to have an impact on L2 speakers' comprehensibility and intelligibility. For example, the perception of L2 fluency and speech seems to be affected by differences between L1 and L2 stress, speech rate and timing, pitch and intonation (Anderson-Hsieh et al., 1992; Kormos & Dénes, 2004; Munro & Derwing, 2001; Munro, 2008; Wennerstrom, 2000).

L2 prosodic production also affects the pragmatics of communication. For example, L2 prosodic production may result in disfluency, overlaps or interruptions in the flow of speech; it may thus contribute to making conversation unpleasant or frustrating, or cause distraction or annoyance (e.g., Anderson-Hsieh et al., 1992; Munro, 2008). Also, L2 prosodic production may be associated with paralinguistic meaning that is not intended by L2 speakers, but that may form the basis for prejudice or negative stereotyping, and thus increase the odds of L2 speakers' social or professional discrimination (see studies reviewed in Busà, 2007). For example, Northern

Standard Germans' (NSG) speech tends to be associated with lack of liveliness by Southern Standard British English (SSBE) speakers because it is characterized by a rather low pitch. In comparison, SSBE speakers sound overexcited to NSG speakers because SSBE is characterized by very varied pitch (Mennen et. al., 2008).

Finally, L2 prosodic production may result in speakers' inability to mark information structure in discourse, that is, to assign prominence to speech constituents. This may make L2 speakers unable to differentiate between lexically stressed and unstressed elements in a sentence, signal emphasis, prioritize information, disambiguate sentences etc. (Mennen, 2007; Ramírez Verdugo, 2006).

The importance of prosody for successful communication in L2 is unquestioned, and its role is generally recognized in today's L2 pronunciation teaching courses (e.g., Romero-Trillo, 2012; Trouvain & Gut, 2007). However, prosody is notoriously considered difficult to teach and learn, due to its inherent complexity and the intricate relations between linguistic and paralinguistic features that characterize it (Wrembel, 2007). Teaching prosody is also made difficult by the fact that L2 learners are not always aware of the uses and meanings of prosody even in their own language. To overcome this, it has been suggested that teaching prosody should involve raising learners' awareness about prosody and intonation patterns (Chun, 2002; Wrembel, 2007)

Despite the importance of prosody to L2 communication, we still know little about L2 prosody acquisition processes and the effects of L2 prosodic production on listeners. More comparative descriptions of L1 and L2 prosodic systems are needed to gain knowledge about L2 prosodic production, and to provide data for enhancing teaching methods and materials. Such accurate descriptions are often missing, or present single and standardized accounts of prosodic phenomena –though, in fact, prosody is characterized by considerable variation that is traceable to differences between speakers, language variety, linguistic function, paralinguistic meaning, etc. (e.g., Clopper & Smiljanic, 2011; D'Imperio, 2002; Grabe, 2004; Joerg et al., 2002; Kelly 2012).

This study investigates the nuclear intonation contours of English Yes-No questions produced by Italian native speakers, and compares them with those produced in English L1 and Italian L1. In so doing, it aims to contribute to the field of L2 acquisition by providing data on English L2 prosodic production.

About L2 prosody acquisition

One of the active strategies in L2 prosody acquisition is transfer, a well-known mechanism also in the acquisition of L2 segments. In fact, it has been shown that prosodic transfer may occur even after learners have been exposed to the L2 for considerable time (Trofimovich & Baker, 2007; Mennen, 2007).

For segments, current models (SLM (Flege, 1995) and PAM/PAM-L2 (Best, 1995; Best & Tyler, 2007)) have proposed that L2 acquisition processes and outcomes may be affected by the degree of similarity/dissimilarity between L1 and L2 sounds, which would affect learners' perception by making them identify some of the L2 sounds with some of their native language sounds (Strange, 2007).

It is likely that a principle of similarity/dissimilarity may apply also in the acquisition of prosody. However, for prosody, this principle would seem to be much harder to establish than for

segments, due to the complex nature of prosodic systems, the variability existing across speakers and dialects, and the interrelations between forms and linguistic and paralinguistic functions (e.g. Ladd, 1996; Gussenhoven, 2006).

In order to generate predictions as to the relative difficulty of production and perception of L2 intonation based on a scale of cross-language similarity/dissimilarity, Mennen (2015) has proposed that similarities and differences between L1 and L2 intonation should be characterized along four dimensions (Mennen, 2015: §3.1). These are: (1) The phonological (or systemic) dimension, which concerns the inventory of prosodic elements that are linguistically meaningful in the language (e.g., types of intonation patterns, pitch accents, prosodic words, etc.), as well as the typology of combinatorial possibilities (of tune-text associations, tone sequences, etc.); (2) The phonetic (or realizational) dimension, which concerns how the prosodic features are implemented –for example, the scaling (i.e., the relative height) of pitch accents in an utterance, their alignment with the segments, or their shape (i.e., steep falling or rising); (3) The semantic dimension, which concerns how the prosodic elements are used for conveying meaning –for example, crosslinguistic differences in the use of pitch for marking focus or interrogativity (e.g., while English marks yes/no questions with rising intonation, Greek uses falling intonation (Mennen, 2015)); (4) The 'frequency' dimension, which relates to similarities and differences in the cross-linguistic use of phonological elements, e.g., pitch accents and boundary tones.

According to Mennen (2015) L2 learners may show deviations from the native norm in each of the four dimensions of intonation, but the deviations occurring in some dimension may be more frequent than others, probably because not all intonation dimensions present the same level of difficulty for L2 learners. Some evidence also suggests that different dimensions may be subjected to different acquisitional rules, in the sense that over time learners may improve in some dimensions of intonation but not others. For example, studies show that L2 learners may eventually be able to acquire the phonology, but may rarely acquire the phonetics of L2 prosody (Mennen, 2007; Stella, 2012; Ueyama, 1997).

However, it remains to be determined which aspects of L2 prosody are more difficult for learners to acquire.

The Present Study

This paper investigates nuclear intonation contours in Yes-No questions in English L2, as produced by Italian native speakers, and in Yes-No questions in Italian L1 and English L1 as baseline NS data. The aim is to test the hypothesis that L2 learners may show different acquisition strategies for different dimensions of intonation. In particular, this study investigates the acquisition of the phonological and phonetic components of intonation. Considerations will be drawn on the effects of L2 learners' intonation for perception/communication and pedagogy.

METHODS

Materials, Subjects and Procedure

The experiment compares the production of English L2 speech by Italian native speakers with the production of Italian L1 and English L1 speech as baseline NS data.

One test (English L2) and two baseline NS (English L1 and Italian L1) data sets were created for

the experiment; from each data set Yes-No questions were extracted from mini-dialogues of question-answer pairs read by the subjects.

The questions contained 4 highly comparable target words having all-sonorant segments, and stress on the antepenultimate or the penultimate syllable. These words are, for English: Me**mo**rial, Ba**na**na, **Nor**mandy, **Me**mory; and for Italian: Me**la**nia, Ba**na**ne, **La**mina, **Mo**bile (stressed syllables are indicated in bold). The words occurred in sentence-final position in each data set (e.g., *Will you attend the **memorial**?*, *Hai sentito la **Melania**?*).

The subjects were 4 Italian speakers (Padova area, North-East Italy) and 3 English female speakers (London area, UK). All speakers had a similar level of competence in English (B2, Common European Framework of Reference for Languages (CEFR)). The Italian speakers read the English L2 and the Italian L1 data sets; the English speakers read the English L1 data set. Each speaker read the data set 5 times at a normal pace. Thus, the material consists of 80 tokens for English L2 and Italian L1 (4 target words x 5 repetitions per 4 speakers), and 60 tokens for English L1 (4 target words x 5 repetitions per 3 speakers). The speakers were recorded in a quiet room with the professional equipment available at the *Language and Communication Lab*, University of Padova.

Phonetic and phonological analysis of the data

The phonological analysis focused on the nuclear pitch accent of the target words. The acquired audio signals were labeled using the *Praat* software (Boersma & Weenink, 2009). We labeled the onset and offset of all syllables in the accented word and the sequence of high (H) and low (L) tones of the pitch accent and the boundary tone associated with that word. Tonal targets are labeled HN and LN for nuclear pitch accents and HE and NE for boundary tones. The pattern of alternation of H and L tones was then used to classify the whole F0 contour and to determine the occurrence of each intonational pattern out of the total amount of the speakers' productions.

The phonological description of pitch accents occurring in nuclear position was conducted auditorily and through a phonetic examination of tones alignment, i.e. measuring the ratio between the latency of the H and L tonal targets and the duration of the associated tonic syllable. We used this measure as a criterion to determine the phonological category to assign to accents. An Univariate ANOVAs and Tukey post-hoc tests were then run on data to test whether our phonological description is stable among speakers. Alternatively, a t-tests for independent samples is run when referring to two speakers only.

This data analysis aimed at providing a phonological description of the nuclear contours that occur more frequently in Yes-No questions produced in English L2 and Italian L1 by native (Padova) Italian speakers, and Yes-No questions produced in English L1 by (London) English native speakers.

RESULTS

Italian L1 Nuclear Intonation Contours

In Italian Yes-No questions, the Padova Italian speakers produce nuclear intonation contours with falling pitch accents (70%), as well as rising pitch accents (30%). Both accents are followed by either rising (48,.7%) or falling boundary tones (51.3%). Figure 1 shows the phonetic

realization of falling accent and rising accent in two productions ending with a rising boundary tone. For each contour, the ToBI phonological label assigned to the accent is shown.

The rising accent is labeled L+H* (Fig. 1, top panel) and represents the typical realization of the Padua Italian variety –the use of the rising accent in nuclear position of Yes-No questions is highly marked with respect to other varieties of Italian (Gili Fivela et al. 2015). This accent is aligned with the tonic syllable in the production of the 4 Italian speakers: LN is aligned at a mean of 18% of the tonic syllable with a significant difference among the 4 speakers ($F(3,20)=6.814$; $p=0.002$); HN is aligned at 94% without any difference between the speakers ($F(3,20)=2.256$; $p=0.113$).

The falling accent, labeled H+L* (Fig. 1, bottom panel), is another option available to the Padova Italian speakers and is a more common pattern for Yes-No questions among other varieties of Italian (Gili Fivela et al., 2015). The results show that the F0 fall is synchronized with the tonic syllable: the means show that H is aligned 6% before the onset of the tonic syllable, and L is aligned at the end of the syllable. Both targets are significantly different among speakers (H: $F(3,52)=11.153$; $p=0.000$; L: $F(3,52)=22.562$; $p=0.000$). However the post-hoc tests show that 3 out of 4 speakers show the same alignment: for H only speaker 2 produces a different pattern, while for L it is speaker 4 who produces a different pattern.

English L1 Nuclear Intonation Contours

The English L1 speakers produced Yes-No questions mainly with two types of nuclear pitch accents: rising accent (63.3%), and high accent (30%). Both are followed by low-level boundary tones.

The rising accent in nuclear position (Fig. 2, top panel) was mostly produced by 2 of the 3 speakers. The F0 rise is consistently synchronized with the tonic syllable: L is aligned at 12% of the tonic syllable, with a significant difference between the two speakers ($t=3.588$; $p=0.001$), and H is aligned at 83%, with no statistical difference between speakers ($t=1.912$; $p=0.064$). On the contrary, the third speaker produces a high pitch accent in nuclear position, with no F0 rise and realized through a high tone sustained from the beginning of the intonational phrase until the half of the tonic syllable (44%). In this case the high tonal target is very difficult to detect because F0 falls gradually along the tonic syllable and the entire contour shows a very narrow pitch range. Given these realizations, the rising accent is labeled L+H* and the high accent H*. While the H* accent is not found in Italian, the L+H* accents are present also in Padova Italian but have a different phonetic form, with L starting from a higher F0 value.

Figure 1. Italian L1 Yes-No question intonation contours. Top panel: Rising accent L+H*. Bottom panel: Falling accent H+L*.

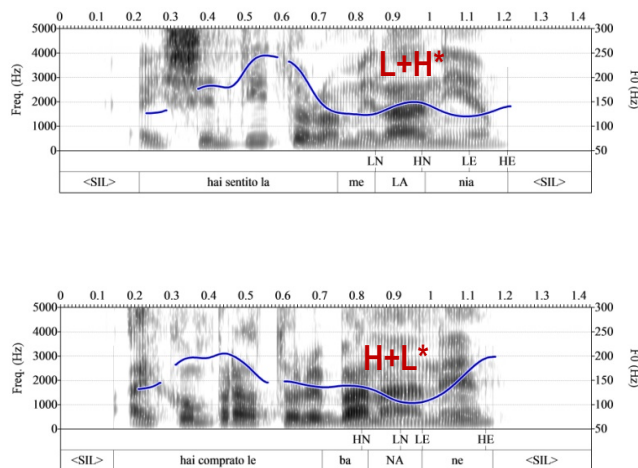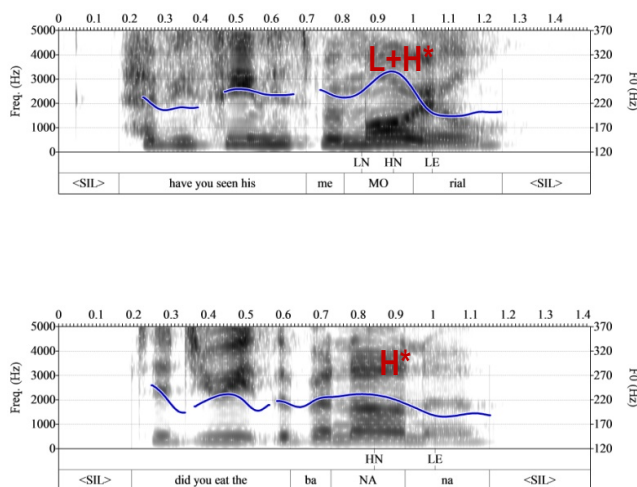*Figure 2.* English L1 Yes-No question intonation contour. Top panel: Rising accent L+H*. Bottom panel: High accent H*.

English L2 Nuclear Intonation Contours

The English L2 Yes-No questions show a different distribution and typology of nuclear intonation contours with respect to those found in Italian L1. Examples are provided in Figure 3.

The most frequent pattern is a falling pitch accent H+L* (45%; Fig. 3, top panel), followed by a rising boundary tone; this contour is produced mainly by 2 of the 4 speakers (1 and 4) and represents a clear example of phonological transfer of intonation from L1 to L2: the nuclear accent has indeed a similar auditory result of the H+L* contour produced in Italian L1, as well as the same alignment with respect to the tonic syllable (H: -15%; L: 75%) with more variability between the two speakers (H: t=9.066; p=0.000; L; t=7.196; p=0.000).

The H* accent is the second most frequent pattern (27.5%; Fig. 3, central panel) and is produced by the other two speakers (2 and 3). This nuclear accent does not occur in Italian L1, and its realization is highly comparable to the patterns found in English L1., While the phonological forms of English L1 and L2 pitch accents are similar, their implementations look different. In particular, the English L2 accents show high pitch excursion values, and are similar to pitch accents used in Italian L1 but are different from those produced by native English speakers. This can be interpreted as a sign that the Italian speakers have correctly acquired the L2 phonological category to produce the English nuclear accent. However, the transfer of phonological features from the L1 to L2 may affect the phonetic implementation of pitch accents, which might be harder to produce by L2 speakers.

The same is also true for the third kind of nuclear pitch accent, which is produced by speakers 2 and 3 with a similar frequency as the H* accent (26.2%; Fig. 3, bottom panel). This accent is auditorily very similar to the H* pitch accent produced in English L2, but shows an alignment comparable to the L+H* rising accent of English L1 (L: 30%; H: 91%). However, its phonological status is not clear, since the entire nuclear contour shows the same high pitch span and range that characterize the productions in English L2 by native Italian speakers. So, here too, the data show that the phonetic implementation of the pitch contour is heavily influenced by the native language system.
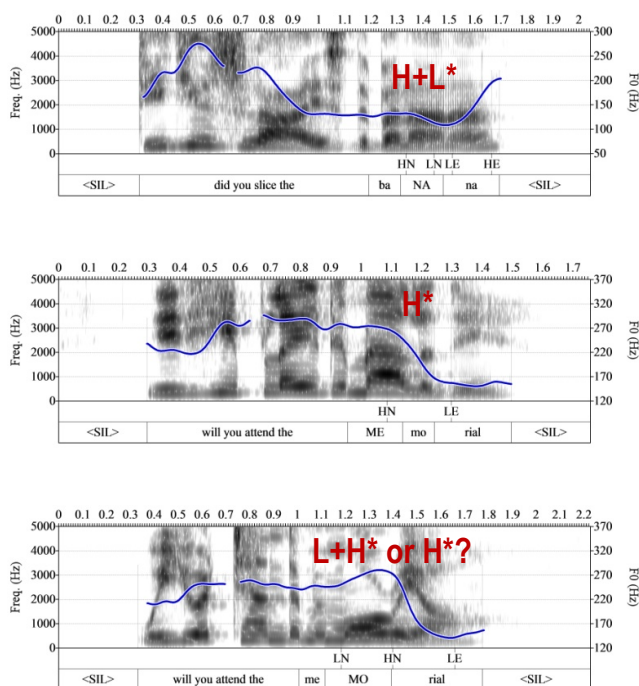
Figure 3. English L2 Yes-No question intonation contours. Top panel: Falling accent H+L*.
Central panel: High accent H*. Bottom panel: Rising accent L+H* or H*.

DISCUSSION

This study aimed to investigate the differences in the production of nuclear intonation contours
in Yes-No questions in English L2 by Italian native speakers, and in English L1, and Italian L1
for comparison. In doing so, the study also aimed to widen the knowledge on the complex and
largely unexplored field of L2 prosody acquisition, a necessary step for the development of
methods and materials for teaching L2 prosody to learners.

The first finding is that both L1 and L2 speakers appear to use different types of nuclear
intonation structures to express the same grammatical function, confirming previous findings that
intonation is characterized by considerable intra- and inter-speaker variation (D'Imperio, 2002;
Gili Fivela et al., 2015; Grabe, 2004; Ladd, 1996). It should be observed that for English L1, the
present data does not coincide with previous descriptions of intonation patterns observed in
London English L1 (Grabe, 2004). This could be further indication of the variability existing in
(London) English, or could be due to differences in experimental procedures. This would need
further investigation.

The second finding is that the development of English L2 intonation by Italian learners seems to
be characterized by the co-existence of different strategies and types of acquisition processes.
The most frequent strategy is the transfer of intonation patterns from the L1, evidenced by the

existence of nuclear contours that are similar, with regard to both phonological type and phonetic details, to those of the L1. However, the learners do not transfer in the L2 the L1 pattern that they identify as most typical of their L1 (i.e., L+H*), showing that they are using some phonological filter in the transfer of categories from L1 to L2.

Secondly, the learners can produce at least some aspects of L2 intonation accurately: this is evidenced by the existence in the L2 of a nuclear contour that is present in English but not in Italian, i.e., H*. However, this contour is produced with pitch ranges that are typical of the L1 and not of the L2, which means that, by failing to implement the phonetic details of the L2 intonation patterns, learners lag behind in the phonetic/realizational dimension.

The present data provide support to Mennen's (2015) proposal that not all dimensions of L2 intonation are acquired equally, and that some dimensions may present L2 learners with greater difficulty than others. It would appear that the phonological dimension is easier to learn for the Italian learners of English than the phonetic dimension, confirming previous research carried out on other L1s and L2s (Mennen, 2007; Stella, 2012; Ueyama, 1997), and showing that L2 learners may be able to acquire the phonology, but rarely the phonetics of L2 prosody.

This study was not designed to test the effect of differences between L1 and L2 in the acquisition of L2 intonation along the semantic and frequency dimensions. However, it is highly possible that such differences play an important role in the development of L2 intonation by contributing to determining what learners perceive as perceptually similar/dissimilar (Mennen, 2015). Future investigations will test these effects, and try to understand the role of all four dimensions of intonation (Mennen, 2015: §3.1) in determining the observed variability.

Objects of further investigation will also be the effect of experience, as a function of age of learning, period of acquisition, and frequency of use of L2 vs. L1. All these factors are known to have a large effect on the L2 acquisition process, and would also contribute to explaining the variability observed in the present data.

Ultimately, as suggested by Mennen (2015), studies of L2 intonation should be aimed at predicting, among other things, the relative difficulty of L2 intonation categories, causing divergences in L2 learners' intonation patterns: what makes these categories difficult to learn, how do they affect learners' acquisition development, along which dimensions do they appear to be more evident, etc.

Being able to predict and recognize what causes divergences in L2 intonation patterns will help us teachers make generalizations, as well as develop methods and materials that are useful for the students to learn L2 prosody.

ABOUT THE AUTHORS

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