

## **Native language influences in focus intonation: analysis of tonal alignment in Italian and German productions of Italian speakers of Lecce (South Italy).**

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Productions in a foreign language (L2) are commonly affected by segmental and suprasegmental features of the phonetic/phonological system of the mother tongue (L1). As for the segmental level, the sounds of the L2, which are close or similar to others of the L1, are deeply influenced by the native system; these influences are perceived as foreign accent but could also be acceptable from the point of view of speech intelligibility and not necessarily lead to a reduction of comprehension (Munro and Derwing, 1995). The same may not be true for segmental sounds of the L2 which are not similar to sounds of the L1 and it is definitely not true for suprasegmental features, which could instead affect pragmatic meaning of the sentence and lead to misunderstandings: Anderson-Hsieh *et al.* (1992) showed that among segmental level, syllable structure and prosody, the latter has the strongest influence on the intelligibility of productions.

The influence of the native prosodic system on the production of L2 intonation has not been studied extensively and needs more research on speakers with different native languages, who learn different foreign languages; indeed, a great part of these studies investigates English as a foreign language produced by speakers with different language background. This problem is reported by Mennen (2007), who compares the results of different works on the acquisition of L2 prosody and identifies two groups of errors caused by L1 influence: phonological errors (use of a category instead of another one; for instance, a rise instead of a fall) and phonetic errors (different implementation of the same phonological category; for instance, a different slope for a rising accent).

A frequent source of errors in the production of L2 prosody is tonal alignment, which refers to the timing relation between tonal targets (high (H) and low (L)) and segmental string. An example of phonetic error in foreign language productions due to differences in tonal alignment is pointed out by Mennen (2004), investigating the prosody of Greek as L2 produced by Dutch speakers: both Greek and Dutch share a prenuclear rise which is aligned later in Greek than in Dutch; the author found that four out of five Dutch speakers with high competence level of Greek transfer the phonetic properties of this tonal category from their native language to the production of the L2, implementing an earlier alignment of the F0 peak.

Many studies on alignment of rising accents of various languages showed that the alignment of L target is consistently “anchored” with the onset of the syllable, whereas the H peak shows more variability and cannot be “anchored” to specific points of the syllable (for Dutch, Caspers and Van Heuven, 1993; for Mexican Spanish, Prieto *et al.*, 1995; for Greek, Arvaniti *et al.*, 1998; for English, Ladd *et al.*, 2000, among others). For example, Prieto and Torreira (2007) analysed the alignment of L+H\* prenuclear accent in Spanish, in order to test the validity of the *segmental anchoring hypothesis* (Arvaniti *et al.*, 1998): the authors found that the low target of the prenuclear rise is aligned with the onset of the syllable in a stable way, whereas the H target tone is deeply influenced by syllable structure and speech rate (this is opposite of what the segmental anchoring hypothesis postulated). Prieto (2009) repeated the same measurements in another experiment with the nuclear falling accent H+L\* of Catalan Yes-No questions and found a pattern of alignment similar to that of the rising accent: the high target is indeed tightly synchronised with the onset of the accented syllable and the low target shows a more variable alignment and is affected by syllable structure and speech rate. It has been proposed that the asymmetry of alignment patterns in relation to the position in the

accented syllable is to be attributed to the properties of intergestural coordination (Prieto and Torreira, 2007; Prieto, 2009). Looking at the timing relations between supralaryngeal gestures and syllable structure could be useful to understand the mechanism at the base of the alignment of tonal target with the segmental material. Some studies on alignment of targets from an articulatory point of view was already conducted on various languages (D'Imperio *et al.*, 2003; D'Imperio *et al.*, 2007; Prieto *et al.*, 2007) and showed that alignment with articulatory gestures is more stable than alignment with acoustic landmarks.

This study aims at exploring the alignment of tonal targets in the productions of different focus conditions in Italian and German produced by speakers from Lecce (Apulia, South Italy) with different competence levels of German as foreign language. A first qualitative analysis has already been performed for Wh- and Y/N questions, considering acoustic semispontaneous materials (Stella, in print): it has been pointed out that the implementation of pitch accents, in terms of alignment of F0 peaks with target syllables, changes gradually in some way through competence levels, also in the production of phonological categories which involves different F0 movement. This claim needs obviously a deep investigation on read speech materials, which can be analysed statistically. Nevertheless, other studies pointed out that the degree of influence of the native system from both a phonological and a phonetic level can be actually correlated to the stage of the acquisition process or to the competence level of the speakers (Ueyama, 1997; Ueyama and Jun, 1998; Jun and Oh, 2000).

In this work a description of the intonational contours is given, following the Autosegmental-Metrical theory (see Ladd, 1996 for a general review) and using two modified versions of ToBI (Beckman and Ayers, 1997): for Italian, a version of the original ToBI system adapted for the variety of Lecce is used, which has been proposed for the description of the question contours and some focalisation processes (Stella and Gili Fivela, in print); for German productions, GToBI (Grice *et al.*, 2005) is used, as realisations of Standard German intonation are expected from speakers with higher competence (otherwise variations of GToBI are used in case of nonconformity with Standard German). German productions are also put in relation with L2 competence level and with the phonetic/phonological system of L1 intonation.

Acoustic and kinematic data of the productions of subjects with three different competence levels (low, middle, high) was recorded with AG500 articulo-graph (Carstens Medizinelektronik) at CRIL (Centro di Ricerca Interdisciplinare sul Linguaggio – Centre for Interdisciplinary Research on Language) of the University of Salento (Lecce, Italy). In order to explore the alignment of tonal targets in a consistent way from both kinematic and comparative points of view, in these productions the realisation of pitch accents on the syllables /ma/ and /man/ is analysed. Indeed, when these syllables are stressed, they are implemented phonetically in the same way for both Italian and German (cfr. Di Meola, 2007) and therefore they are directly comparable. For each language, seven words with the target syllables in stressed position was chosen: they were composed by two or three syllables and had different stress structures (stress on antepenultimate, penultimate and ultimate syllable). Then, they were used to create two corpora of sentences (one in Italian and one in German) which was read by the subjects for at least ten times at two different speech rates (normal and fast) during the articulatory sessions.

The hypothesis is that there are remarkable differences within subjects with different competence levels in the production of nuclear and prenuclear pitch accents in both languages, because of the influence of the native phonological system; this is particularly relevant when the subjects produce sentences containing a narrow-contrastive focus condition used for the correction of a previous assertion of the conversation partner, because German and Lecce Italian exploit two different categories in this case: following GtoBI, Standard

German uses a rising accent L+H\* for expressing contrast (Grice *et al.*, 2005; Baumann *et al.*, 2007; evidences of the use of a rising accent in contrastive themes came also from Braun and Ladd, 2003), whereas Lecce Italian uses a falling accent, analysed as H\*+L (Stella and Gili Fivela, in print). In this study, the narrow-contrastive focus condition is recreated using question-answer pairs, in which the answer is produced with the intended focalization in initial position.

In general, it is expected that speakers with low competence exploit the falling accent (or a modification of it), in order to express this kind of contrast in German, because of the transfer from L1; instead, speakers with high competence and frequent contacts with German native speakers are expected to exploit the correct category, implementing a rising accent (or, again, a modification of it). Obviously, no sharp differences among the competence levels are expected, since there is a gréât amount of variability in production among the speakers. However, comparing the productions as for the competence level, modifications of the alignment could be detected as gradual trends.

In the present contribution only the acoustic data will be discussed; acoustic results will provide an analysis of variations in the alignment of targets related to different competence level, syllable structure and speech rate, which will be the starting point of an articulatory investigation on intergestural timing between the gestures composing the target syllable and their interactions with the position of H and L tonal targets.

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