## Cue weighting in the perception of English tenseness contrast by Polish and Croatian subjects

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In English, the contrast between tense and lax high vowels depends on durational and spectral properties. For high front vowels, most varieties rely to the larger extent on spectral properties with only a small contribution of the durational cue (e.g. Hillebrands et al. 1995, Petersson and Barney 1959). Many studies show that non-native speakers rely predominantly on durational cues – at least at an earlier stage in acquisition (Bohn 1995, Escudero 2001, 2005, Flege and Bohn 1989, Flege, Bohn, and Jung, 1997, Kondaurova and Francis 2004). This appears to be true both for learners with and without phonemic vowel length distinction in their L1. Our hypothesis is that learners over-rely on duration if they have no access to other helpful perceptual strategies familiar from their L1.

We present a study in which we investigate the perception of the tenseness contrast in English by subjects with Polish and Croatian as their L1. Polish has been selected because it has (1) no phonemic distinction in vowel length, (2) it has two front high vowels in their phonemic inventory which differ in their spectral properties, but it has only one back high vowel<sup>1</sup>. Croatian was selected because, as opposed to Polish, it has a regular phonemic length distinction in vowels, and the short and long vowels do not differ substantially in quality. Our research questions were:

1. Do Polish subjects rely on the durational cues in the perception of the tenseness contrast of high front vowels or do they rather use the spectral cues as a result of transfer from their L1?

2. Do Polish subjects rely on durational cues in the perception of high back vowels, i.e. do they follow the same strategy as in the perception of front high vowels even in the absence of the native contrast in this particular perceptual space?

3. Do Croatian speakers behave as expected, i.e. do they over-rely on the durational cues?

We have used two experimental designs. The first experiment was a forced-choice identification test, using stimuli manipulated in the duration and quality (5 steps duration and 5 equal steps using Bark scale w.r.t. quality). As it turns out, many subjects even with relatively advanced command of English have not established two stable separate categories, especially for back high vowels. Consequently, all subjects were tested also using the AXB design, in which subjects are presented with triads of sounds and asked if the middle sound belongs to the first or rather last category.

The initial results indicate that Polish L1 subjects (both very advanced and less advanced) show in the identification tests no statistically relevant reliance on duration as the cue for the contrast in the front high vowels. For back vowels the weighting of the durational cue is slightly higher (though the relation between the stimuli length and the answer category is still statistically irrelevant). In front vowels, the center of the lax category for Polish subjects is shifted in comparison to American control group, and namely, towards the Polish [i]. The Croatian group shows, as expected, statistically relevant reliance on the durational cue. The AXB experiments show similar results, with Polish subjects paying remarkably less attention to duration than the Croatian subjects.

<sup>&</sup>lt;sup>1</sup> The two vowels are often transcribed as [i] and [i], and the more central vowel has been described in phonological literature using features [+back, -round]. Such analyses are, however, abstract and are contradicted by phonetic descriptions of Polish (Wierzchowska 1980, Koneczna & Zawadowski 1951).

## Identification test, Polish subjects



## Identification test, Croatian advanced subject





