The NCM and the reprogramming of latent phonological systems: A bilingual approach to the teaching of English sounds to Spanish Students

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Abstract

In this paper I intend to present theoretical support and guidelines for the design of a Native Cardinality Method for the teaching of L2 vowels and consonants to adult students, especially adapted to the teaching of English in Spanish universities. The method must be designed so that it promotes a flexibilization of the learner’s native phonological system by making it ready to accept new phonemic units, and new complementary distributed allophonic variants. Based on Daniel Jones’s famous Cardinal Vowel descriptive system, NCM implies the use of L1 sounds as starting points for the progressive acquisition of L2 vowels and consonants.

1. Introduction: the Native Cardinality Method

Teaching English Phonetics at the University of Valladolid, and working with Gimson’s Pronunciation of English (Cruttenden 2001) as my basic source, for a number of years I used Daniel Jones’s system of cardinal vowels for the description of the English vowels. Very soon I realized that as one moves from accurate objective description to the actual task of teaching pronunciation, the usefulness of the famous quadrilateral increases when the vowels of not one but two languages are represented upon it, so that the units of one of them –usually the L1– may function as points of reference for the units the other (see Finch&Ortiz 1982). The quadrilateral represents the area of action of the tongue dorsum, and any points within this ‘map’, including L1 vowels, may be taken as points of reference. The notion is by no means new. In a 1969 paper, B. Lindblom and J. Sundberg considered this possibility briefly, only to reject it on the basis that “there are large variations among speakers of the same language owing to dialectal, sociological, and other factors” (Lindblom&Sundberg: 19). One must notice, however, that accepting this argument would bring down the whole possibility a Cardinal Vowel system: if the vowels of a language showed such an irreducible variability, it would be impossible for us to describe them at all, and certainly

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not with the help of Jones’s quadrilateral. On the other hand, the moment we represent the vocalic units of a language upon the traditional quadrilateral, as phoneticians have been doing for decades, we are accepting the possibility of using them as points of reference. Still, the problem of intra-language variability has to be properly addressed.

Phoneticians have managed once and again to provide the formantic values of the vowels of most languages, which proves that intra-language variability of vowels is satisfactorily reducible (Quilis & Esgueva 1983, Cruttenden 2001, Deterding 1997). Although these values will depend on the group of speakers selected for study, once regularity has been found across any group of speakers, such regularity may become referential. The issue for me is not so much proposing a fixed group of universally, nationally or regionally accepted cardinals, as the practical incorporation of the notion of inter-language cardinality to the teaching of L2 pronunciation.

The Native Cardinality Method (NCM) would ideally work upon a principle of phonological expansion, which means that our goal is to expand the learner’s L1 phonological system so as to incorporate new units, rather than to build a secondary, independent and parallel system where L2 sounds refer exclusively to one another. At this point, an endless discussion might ensue around the topic of whether the L2 phonemes are acquired, stored, retrieved, etc., as those of the L1, or in a different way. In this respect, one cannot but observe that the traditional three language-acquisitional factors of manner, stage and age of second language acquisition (Vaid 1983: 322-331) may logically give way to so many possible stages of assimilation and ways of assimilating an L2, that existing experimental approaches can by no means foresee the feasibility of this principle of phonological expansion. Also, in devising teaching methods according to what we know about the human brain, a reasonable suspicion emerges when one realizes that experimental conclusions are often based on statistic reductions. It is said, for example, that up to 97% of world population—let us say some 6,840 billion people—have a left brain dominance concerning the use of language (Obler & Gjerlow: 87); this points to a significant tendency, but it also highlights the fact that, as an impressive minority of about 200 billion people proves every day, the right hemisphere is perfectly capable of being in charge of most things concerning language. One cannot foresee what the NCM will do or can do at a neurological level until it has been put to practice. The odds are that being conceived as a formal method oriented to adults, it is likely to promote a pattern of intra-hemispheric activity similar to that of monolinguals and early bilinguals (Vaid 1983), which seems an adequate goal. For the pronunciation instructor, however, the question is not how the brain does it but whether it does it at all.

The NCM stands upon two elemental and interconnected working hypotheses: (1) that there is such a thing as a native phonological system somewhere inside our students, and (2) that we can help these students to access it, become aware of it, and transform it: we would train them to reprogram their latent phonological system. Let us say, in an attempt to dissipate the metaphoric aroma that impregnates this paragraph so far, that there is such a thing as a specific kind of phonological work, which is itself a form of practical reductionism practiced by the speakers of a language, by virtue of which an open, indefinite and potentially infinite set of acoustic phenomena is systematically reduced to a small and limited set of linguistic functions. It is this phonological work that allows us to identify a concrete acoustic phenomenon as an allophonic variant of a particular phoneme. The phonological system is the theoretical underlying mental structure that allows us to perform this phonological work. Phonemes belong to an abstract noospheric dimension, also inhabited by other familiar entities such as thoughts, memories, or conceptual meanings. Although phonemes, thoughts and concepts, seem to have a neurological correlation, they are not identical with it, just as the thought of a lion as a phenomenological state does not look like the flashing of neurons that correlates with it. A good way to check the existence of a phoneme consists simply in imagining it. The fact that people can evoke in their minds the sound of any of the vowels of their L1 pronounced in citation form proves that such phonemes exist for them in that noospheric domain. Most of my first year students of English at the University of Valladolid, especially those who have never taken a specific course on English phonetics or pronunciation, even when they have a certain level of English and have been often exposed to it, cannot imagine the sound of any particular English vowel as a sound different from those of the Spanish Vowels. One of the initial objectives of NCM is no other than to teach students to perform this simple evoking task successfully, in the belief that enriching one’s phonological system with new units is a primary concern in the teaching of pronunciation.
2. From crystallization to flexibilization to expansion in 4 steps

For most of my first year students, vowels and consonants are very mysterious entities. They pronounce them every day and yet, most of them do not know how they do it, which means that they must leave to their intuitions the task of pronouncing them differently. A majority of them use their organs of speech as a musical instrument they play by ear. At the core of this unknowing, their phonological systems generate a sort of functional timbre blindness which influences their perception of the English vowels. As we know, in its standard varieties, none of the vowels of English coincides in timbre with any of the European Spanish vowels, and yet, in listening to an English word like <pit>, many first year students wrongly perceive and reproduce a Spanish front close vowel {i} as its syllabic nucleus. Since NCM is a formal method for adult learners, our first step towards a flexibilization and reprograming of the native phonological system has to do with bringing articulation into awareness.

2.1. Step 1. Becoming aware of articulation as a step towards increased perception

I am going to concentrate on vowels first. As in many other formal methods of pronunciation teaching, our first goal is to make our students understand the role of the dorsum, the jaw and the lips in the production of timbres. This is not intended, at this early stage, as a step towards production. The flexibilization of the phonological system requires, in my opinion, an increment of the student’s potential for perceptive discrimination. The goal now is to provide for our students the experience of what it means: ‘a closer timbre’, ‘an opener timbre’, ‘a more centralized timbre’. If we are to describe this experience in words, we would say that the closer Spanish {e} gets, the more it sounds like a Spanish {i}; the opener Spanish {o} gets, the more it sounds like a Spanish {a}, etc. In the case of students whose L1 is Spanish, vowel perception is organized along 5 fundamental areas coinciding with the 5 Spanish vowels {a, e, i, o, u}. Most English vowels will later be described as opener, closer and/or more centralized realizations in relation to the Spanish cardinals.

2.2. Step 2. Exercising perception of non-Spanish and not necessarily English timbres

Exercises on timbre perception must begin with the Spanish mid vowels {e, o}. With the help of a formant synthesizer like Jonas Beskow’s (2000) we will expose our students to a variety of vocalic timbres that are slightly different to the habitual Spanish vowels. For example, students may be exposed to the following sequence: Sound 1 (F1: 453Hz; F2: 1995Hz), Sound 2 (F1: 390Hz; F2: 2102Hz), Sound 3 (F1: 327Hz; F2: 2209Hz) and Sound 4 (F1: 264Hz; F2: 2316Hz), where sounds 1 and 4 are roughly Spanish vowels {e, i} respectively, and sounds 2 and 3 are acoustically equidistant sounds, synthetically generated with decreasing differential of 63Hz applied to F1, and incrementing differential of 107,3Hz applied to F2. Similar exposures will be procured for closing of {o}, the opening of {e, o}, as well as for the centralization of all vowels synthetically generated by increasing or decreasing the value of F2. When gradual exposure has been provided, this second step culminates when students are able to compare timbres and describe their perceptions of them with expressions such us ‘closer, opener, (slightly) retracted/advanced, centralized’ and their combination.

2.3. Step 3. Exercising production of non-Spanish and not necessarily English timbres

Ideally, step 2 would or could end when students can imagine –evoke in their minds– the sound of vowels which are slightly opener, closer or more centralized than the five Spanish vowels. This new ability would be an indicator of regained flexibility of the students’ mental resources concerning their readiness to assimilate the units of an L2. Of course, our students’ testimonies of their subjective experiences will never guarantee that the goals of this stage have been properly met, however, the ability to discern and describe timbres, provided that a sufficiently high percentage of success is attained, would be an infallible indicator of readiness. In step 3 the student is simply required to produce and record, in as many attempts as necessary, a variety of timbres which are slightly different from the Spanish vowels, and to do so by simply following instructions such as: ‘(1) produce Spanish {e}, (2) now a
sound which is a bit closer than Spanish {e}, (3) now a sound a bit more centralized than the previous’, etc.’. A specific kind of training will we required here oriented to the increase of the student’s kinesthetic sensitivity. The student must be encouraged to feel and visualize the position of her tongue inside the mouth, the points of contact with fixed articulators, the degree of tongue tension, etc. Awareness of front or back molar contact is usually very helpful. The tightness of this contact is also a good indicator. Centralization is very often felt as a relaxation of the tongue. In the production of back timbres, and general retraction in order to produce darker timbres, the experiencing of front dorsum depression is quite useful. In sum, contact with molars and the tightness of this contact often assist the perception of tongue height; tongue relaxation perceptibly accompanies the centralization of front vowels; front dorsum depression is a good kinesthetic indicator of retraction from a central lax position to a back position.

2.4. Step 4. Instruction-guided production of English vowels

From this point on, the NCM might adopt different strategies depending on factors such as the number of students, pre-established course duration, etc. As a final proof that the previous 3 stages have been successfully accomplished, before introducing the exposure to the real English sounds, students might be asked to repeat the exercises in step 3 with the difference that this time, the instructor will be leading them towards the production of real English vowels. It would be a remarkable success if students managed to produce the English sounds by simply following instructions, without imitation at this point. This is actually what phoneticians trained in the production of Jones’s cardinal vowels would do, and this is what allows them to produce satisfactory approximations to vowels they have never heard, following written technical descriptions. The NCM transforms this practice into a generalized pedagogical tool and avoids the problematic step of having to learn artificial vowels.

3. Further steps, specific tools and final remarks

After these first steps, students should be ready to work with minimal pairs –both discriminating and producing the slightest differences. To the traditional minimal pair approach, a few new tools might be added that are perfectly in tune with the NCM. One of such tools is the Mixed Minimal Pair (Cámara 2010), where one of the words is Spanish, the other English, and only one phoneme differs significantly, usually the vowel –e.g. si/sea, su/sue, fa/fa, zen/thin. A similar tool is the Approximate Mixed Minimal Pair (Cámara 2010) where the Spanish and the English words are still interestingly similar although more than one phoneme differ –e.g. tú/too, ten/ten, cheira/shade a, Sirio/city. A third tool in line with the NCM is the Clipped Contrast, where only a portion of a minimal pair –mixed, approximate mixed or traditional– is presented in a quick succession, so that differences, especially consonantal, are highlighted; for example, working with the Spanish/English pair ten/ten, only the first 90 out of 457 milliseconds of the Spanish word would be contrasted with the first 220 out of roughly 580 milliseconds of the English word, in a looped reproduction. These portions in quick succession will show essential differential details like the perceptive properties of alveolar versus endo-dental plosions, the presence of alveolar affrication in English, the different VOTs of the two words, or the distinctive presence/absence of aspiration, together with aspects concerning vowels. Finally, another interesting tool consists in instructing the students to produce artificial –and therefore meaningless– mixed words, where, for example, the first syllable is Spanish and second is English. Simple mixed, approximate mixed, and even clipped contrasts may be turned into artificial mixed words: susue, susue, tantan, tantan, te te, te te – where the first syllable is Spanish, the second English, and the syllable in italics is the one to be stressed.

Although much of what I have discussed in the present paper has been part of my daily practice as a pronunciation instructor for the last 16 years –a practice that I deem reasonably successful–, and although a first attempt at systematizing the NCM has already been produced in the form of a pronunciation handbook (Cámara 2012), further empirical research and testing needs to be done for perfecting the method. It would also be advisable to design mechanisms and protocols for assessing the effectiveness of the NCM, especially in comparison with the more traditional approaches. And finally, one must at least consider the possibility of studying the neurological
implications and effects of a method that aims at transforming, reprogramming and expanding a deep mental structure such is the native phonological system of students.

References