

Phonic Transfer: The Structural Bases of Interlingual Assessments

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1. Introduction

For a number of years now, dissatisfaction with the power of 'predictive' or even 'diagnostic' structural phonologically-based comparisons of native language (NL) and target language (TL) to explicate the occurrence and above all the variability of TL pronunciation forms (cf., e.g. the attempts of Ritchie (1968) and Michaels (1974) to analyse the problem within a feature framework) has led to increasing attention being paid to extra-linguistic determinants of L₂ pronunciation variation: predominantly those relating to verbal task and level of proficiency. Much of this dissatisfaction with structurally based models of explanation stems from i) the inherent restrictions imposed by the descriptive frameworks adopted and, ii) partly deriving from this, a simplified view of the dynamics of second language production and acquisition. The assumption being that learner TL linguistic behaviour will manifest to a greater or lesser degree the structural properties of the NL phonology (whether specified in terms of phonemes, features or, latterly, syllable structure primes) and/or the physically, predominantly acoustically, established phonetic properties of the NL. It is the purpose of the present paper, in an examination of a persistently knotty, but typical, problem in the analysis of second language segmental production, to suggest ways in which both descriptive frameworks and, concomitantly, structural perspectives on L₂ sound learning and performance need to be broadened in order to account adequately for the observed data.

2. Structural bases

2.1.

Within present frameworks, the relations between on the one hand observable structural determinants of TL pronunciation behaviour and on the other observed variability in the pronunciation of TL forms are difficult to capture. While accepting that all manner of psycho-, socio- and extra-linguistic factors must clearly co-determine patterns of sound system acquisition and production with their inherent variability, any attempt to establish a defining link *between* structural properties of both NL and TL, *and* such variability

must in the first instance come to terms with the structural 'what' that is to be produced and acquired in a TL. In contrast to phonologists and phoneticians working on child language, researchers in foreign language acquisition have been strangely reluctant to address this issue. Production and acquisition of a TL sound system involves command of a) a phonological structure, b) a phonetic structure, and c) an articulatory structure (cf. James 1983). In the most general terms, these structures may be characterized as, respectively, a) the systematic arrangement of elements defined in terms of their relative distinctiveness; b) the systematic arrangement of physically measurable properties associated with such elements; and c) the systematic arrangement of motor configurations associated in turn with such properties and elements.

2.2.

The proximity of any L_2 utterance to a target norm may be assessed with regard to the degree of proficiency in each or all of these structural components of the sound system, which involves not only command of the elements themselves but also of the patterns of association obtaining between the forms of the different components: e.g. for any given 'phoneme', there must be an associated set of phonetic properties and an associated articulatory configuration. Thus for /s/, the structural associations may take the form

$$/s/ \sim \left[\begin{array}{l} \text{alveolar} \\ \text{fricative} \\ \text{etc.} \end{array} \right] \sim \left\{ \begin{array}{l} \text{tip-blade raising} \\ \text{tip-blade advancing} \\ \text{etc.} \end{array} \right\}$$

the latter being expressible in terms of, for example, the articulatory parameters of Hardcastle (1976) or Ladefoged (1980). The direct structural influences of the NL may be present to a greater or lesser degree within these structural components and the associative links between them. The degree to which they are present is a product of the foreign language learner's *own assessment* of the relatedness of TL and NL structures. NL structures are not automatically projected willy nilly onto TL forms. Of course reliability judgements fluctuate: diachronic patterning of gradual approximation to TL forms as shown, e.g., by Dickerson (1975), is reflective of increasingly negative values of reliability assessment, which in turn corresponds to developing proficiency in the TL. Synchronically, such assessments are crucially mediated by structural factors and variation itself by pressures of the suprasegmental context. Sound elements which are perhaps most directly available to cross-linguistic comparison are those which constitute the phonological 'alphabet' of a language, i.e. the minimal concatenative elements of lexical entries.

3. Interlingual assessments

3.1.

In the light of the discussion so far, consider now the explication of a well-known pattern of Dutch English pronunciation which has resisted analysis within traditional frameworks of reference; i.e. the observation that English [ð] is predominantly produced as a dental stop or tap word- or syllable-initially and as an alveolar fricative finally. In its segmental inventory Dutch has [t̪ d̪] (dental stops) as well as [s̪ z̪] (post-alveolar fricatives). Intuitively, it would appear that this distribution of non-target variants of [ð] in Dutch English may be related to some kind of positional strength hierarchy as, eg., proposed by Hooper (1976), whereby in syllable-initial position, i.e. a 'strong' position, a 'strong' consonant - here a stop - might be more likely to occur than a 'weaker' one (e.g. a fricative), and vice-versa in syllable-final position as a 'weak' environment. However, why does German English for instance have primarily [s] or [z] for [ð] in either position, when German has both dental-alveolar stops and fricatives?

3.2.

The assessment procedure of a Dutch speaker of English with regard to [ð] may be reconstructed as follows:

phonological:	gross distributional relatedness to a number of C types in the NL
phonetic:	place — dental/alveolar ~ NL [t̪ d̪ s̪ z̪] manner — fricative ~ NL [s̪ z̪]
articulatory:	tip advancing, raising, etc. ~ NL [t̪ d̪]

The suprasegmental context in which the sound is embedded in actual production then determines which potential form of the segment is realized, i.e. conditions the source of the phonic transfer. However, within a hierarchically ordered phonological framework the structural status itself of a given sound unit is determined by properties of the suprasegmental context (cf., e.g., James, 1982). Consistent with 'natural' interpretations of phonological structure (cf. Linell, 1982) and current 'non-translational' models of speech production (cf. Fowler et al., 1980), structural features of the suprasegmental context may be seen to be directly 'realized' - as various types of linguistic constraints - in speech performance. One such linearly effective constraint on the speech syntagma derives from the phonological analysis of syllables as comprising the constituents onsets and rhymes, phonetically characterized by respectively 'consonantal' and 'vocalic' feature values and articulatorily by respectively closing and opening gestures of the vocal tract (cf. also

Fowler, 1980). Globally, given phonoacoustic structure and degree of phonological 'strength' (James, 1982), the constraint may be expressed as maximal pressure for occlusion at syllable onsets, maximal pressure for aperture at rhyme (nuclei). Another such constraint, relevant to languages such as English, Dutch and German, derives from the phonological analysis of syntagmatic units of speech into 'heads' and 'clitics' i.e. proclitics and enclitics (cf. Knowles, 1974), phonetically characterized by local rate of utterance (cf. also Crompton, 1981) expressible as accelerando to head, rallentando on head and enclitic, and articulatorily by velocity of gesture. At syllable level, the constraint may be expressed as maximal pressure for high velocity at onsets, maximal pressure for low velocity at rhymes (nuclei and codas).

If, on the basis of relatedness assessments - (phonological), phonetic or articulatory -, there is a form of the NL available meeting these constraints, it will be transferred. In the case of Dutch English, the articulatory configuration associated with NL [t̪ d̪] is commensurate with the requirements of suprasegmental position syllable-initially (i.e. at onset), therefore a [t̪] or [d̪] will be transferred, whereas in syllable-final position the choice of a fricative articulation is suprasegmentally more motivated, the produced form thus reflecting the phonetic association made between place and manner properties of TL [ð] and NL 'equivalents', an alveolar fricative being transferred. In the first example, the structural basis of phonic transfer is articulatory, in the second, phonetic. In German English on the other hand, association is restricted to that of phonetic structure. Standard German [t d] involves an articulatory configuration of tip and blade raising and advancing, [s z] blade raising and advancing (Wängler, 1974; Lindner, 1975), thus there is no articulatory structure within the NL available to meet the requirements of the suprasegmental context. However, in all cases the suprasegmental context will exert an influence on the 'manner degree' of segments initially and finally via the constraints of tract occlusion and articulatory velocity. Thus, syllable-initially in unstressed syllables the target [ð] in Dutch English is observed as a dental tap [ɾ], indicating that the intrinsically faster closure rate of a tap articulation (as opposed to a stop) is necessary for the completion of occlusion in conditions of high utterance rate as associated with unstressed syllables in phrase proclitic position.

4. Conclusion

The present analysis hopes to show that the linguistic explication of TL pronunciation data necessitates a more differentiated view of the structural determinants of phonic transfer than has seemed to be possible within received phonological and phonetic frameworks of reference.

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