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Consonant–vowel interaction in Sichuan Chinese: An element-based analysis

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Abstract

This paper focuses on the representation of place of articulation features in consonants and vowels, on the basis of interaction between consonant and vowel place. New data from Sichuan Chinese are examined, which show at least four types of consonant–vowel interaction: labial attraction, two types of coronal attraction and velar attraction. Since consonants and vowels show patterns of interaction at all places of articulation, we argue that consonant and vowel place should be described using the same representational elements. We propose that the relevant generalizations reflect the historical development (not synchronic alternation), and show that an account using standard Dependency Phonology unary features can capture these facts.

Keywords: Place of articulation; Phonological features; Dependency Phonology; Consonant–vowel interaction; Sichuan (Chengdu) Chinese

1. Introduction

Phonologically, place of articulation is traditionally represented by way of distinctive phonological features. In a proposal such as that by Chomsky and Halle (1968: Ch. 7) (SPE), features for vowels (such as [high], [back] and [round]) form a set that is distinct from the set of features that is used to represent primary place of articulation in consonants (such as [coronal] and [anterior]). Although vocalic features can be used to make finer distinctions between different groups of consonants (e.g. palatals, velars, uvulars and pharyngeals; SPE, p. 305ff.) or to represent secondary articulation (ibid.), a plain coronal [t] and a high (non-retroflex) vowel [i] will have no place features in common: the set of primary place of articulation features for consonants is distinct from that for vowels. The SPE proposal represented a departure from an earlier tradition of segment representation (Jakobson et al., 1952), as noted in SPE itself, where features like [diffuse], [compact] and [grave] ''served to characterize the main articulatory configurations in the vowels as well as the consonants'' (SPE, p. 306).

In recent years, several phonologists have argued in favour of a return to the pre-SPE position, by advancing proposals in which place of articulation is unified: in such proposals the same set of features is used (at least partially) for the representation of place of articulation in consonants and in vowels (see e.g. Anderson and Ewen, 1987:237ff.; Clements,

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1991; Hume, 1994; Clements and Hume, 1995; van de Weijer, 1996; Yip, 1997; Smith, 2000; Morén, 2006, among others). Although these proposals differ in the overall frameworks that are used (Feature Geometry, Dependency Phonology, and other frameworks) and other important details (such as the fact whether unary or binary features are used), they agree on the fact that the same set of features should be used for the representation of place (and perhaps also other phonological characteristics) of consonants and vowels. Apart from the fact that the unary-feature frameworks are formally simpler and therefore more restrictive (as per Occam's razor), the main empirical argument is that consonant place and vowel place may interact directly in synchronic phonological rules (or constraints) or diachronic processes. In such proposals, for instance, a labial consonant and a round vowel share a feature, as shown in the partial representations in (1), where the symbol U represents a Dependency Phonology-style unary feature (also referred to as an 'element' or 'component', and also adopted in Government Phonology (Kaye et al., 1985) or Particle Phonology (Schane, 1984) approaches):

(1) /p/ /u/
C V consonant/vowel position[1]
| |
U U 'U tier' = labiality/roundness

Representations like these should be contrasted with the SPE proposal, where the consonant /p/ would have a feature combination [+anterior, −coronal] (SPE, p. 177) and the vowel /u/ would have a feature [+round] (SPE, p. 309): since in this proposal the consonant /p/ and the vowel /u/ have no place features in common, no interaction between them is expected (see again especially Hume (1994) and the other references cited above). SPE could only handle this kind of interaction by an ad hoc rule, referring to two independent (i.e. formally unrelated) feature values, e.g. changing a [+coronal] consonant into a [−coronal] one after a [+round] segment. The advances in Autosegmental Phonology of the last decades have made abundantly clear that such arbitrariness should be avoided. Numerous interactions of this type have been reported in recent years, so that an alternative like that expressed in (1) should be considered. Interactions may consist of diachronic rules or synchronic alternations, expressed either in rule-based or constraint-based frameworks.

Representations like those in (1) make a number of predictions, e.g. that in some languages a round vowel might render a non-labial consonant labial in synchronic or diachronic processes by autosegmental spreading. Another prediction is that round vowels might be prohibited from occurring next to labial consonants, because both segments have the same feature, due to OCP-type constraints. A final point to make about representations like those in (1) is that the phonetic interpretation of the feature U is dependent on the position where it occurs: if it occurs in a vowel (V-position), it is interpreted (articulatorily) as lip rounding; if it occurs in a consonant (C-position), it is interpreted as a labial articulation (not necessarily involving lip rounding). This proposal is akin in spirit to the approach adopted by van der Hulst (1988), who also argues that elements, given a unified set for consonants and vowels, must be interpreted differently according to whether they appear in particular positions (consonant vs. vowel, or head vs. dependent). Clearly, the idea that some phonological unit that appears in different segments may be the same at one level (on the basis of empirical evidence) but interpreted differently at another level is a useful one. Finally, if the same feature is interpreted differently in consonants (labiality) and in vowels (lip rounding), this raises the question how a segment is represented that has both, such as a labial with secondary labialization (which occur (distinctively) in some languages, see e.g. Maddieson, 1984; van de Weijer, 2011). We assume this will involve some kind of internal segmental complexity, following earlier literature (e.g. Clements and Hume, 1995; van der Hulst and van de Weijer, 2018).

We might also approach this issue from an acquisition point of view. Let us assume that a child learning her first language has identified the segments /p/ and /u/ in her segmental inventory (which by no means is a trivial step, but we will ignore this here). How could she converge on representations like those in (1), with the same phonological element in both? We might assume, that, at first, she doesn't: a [p] is just a unitary sound and so is [u]. We assume that features are not innate, but emerge in the course of first language acquisition; we do not accept that any phonological representation is 'given' by any innate mechanism (see van der Hulst, 2015 for a proposal of a possible mechanism in this respect, based on categorization). In the case of [p] and [u], the child will perceive (both aurally and, in this case, visually as well) that both sounds are 'lip sounds', so they are similar (articulatorily as well as acoustically) in this respect. When the child also masters the production of these sounds, this insight is reinforced (by 'proprioception'), and

[1] We prefer an interpretation of these positions in terms of syllable structure, so that formally it is the *same* node in the geometry to which the U element in (1) attaches: a root node that occurs in the nucleus of the syllable in the case of the vowel, and a root node that occurs outside the nucleus in the case of the consonant.

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