## The Phonetic and Phonological Similarity of /r/ and /R/ in Coeur d'Alene

Students of Salishan have shown a good deal of interest in the phonetics and phonology of the pharyngeal resonants in Coeur d'Alene, and recently in the pharyngeal resonants of other Interior Salish languages. And these are no doubt interesting sounds. However, it seems to us that the phonetics and phonology of the apical resonants /r/ and /r/ in Coeur d'Alene is equally interesting. Reichard long ago pointed out that /r/ and /k/ belong in the same phonological class as the pharyngesis. In addition it now appears that /r/ is not only rather similar to /R/ phonologically, but phonetically as well.<sup>2</sup> In fact, if Reichard's description of these sounds is taken seriously-as I think it must be--it suggests this fact. I have also given a description of these sounds in another place. In that description I employed the then current distinctive feature system of Jack-of son and Halle. In that older version of distinctive feature phonetics both /r/ and /R/ were specified as /+ grave - diffuse/. Grave was defined articulatorily as "having a relatively large unbroken resonating chamber"; diffuse, as "having a relatively large part of the resonating chamber to the rear of the point of articulation." These specifications are clearly natural ones for /R/, which is pharyngeal. But the classification of /r/

2. I will use r and R for the two series /rr/, the apicals, and /RR R K/, the pheryngeals, respectively.

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as /+ grave - diffuse/ needs some explanation.

Compared with its companion liquid /1/, /r/ is relatively grave. Also, compared with /1/, /r/ is less diffuse. As we can see, /r/ is given a reasonable description by these features only if the universe is the set of spical liquids.

A goodly amount of time has been spent discussing the merits of a relative features approach which allows essentially different definitions of the features subset by subset in the phonology. I think it is a rather bad way to go at things myself. It seems to get into the way of giving believable phonetic explanations for phonological behavior. In the present case in particular, the relative nature of the features grave and diffuse is just too convenient. In any of the languages that I know of with /r/ as opposed to /1/, /r/ is at least slightly more grave and less diffuse than /1/. But, as far as I know, in none of them does /r/ get classed phonologically with velars and/or postvelars as it does in Goeur d'Alene.

Reichard's observations on /r/ are consistent with those I gave. She described Cr /r/ as "close to the apical slightly trilled initial <u>r</u> as it is spoken in most parts of the United States, although the tongue is pulled farther back and the <u>r</u> is anticipated by drawing the preceding vowels correspondingly farther back."<sup>4</sup> One of the important observations she makes here is that Cr /r/ tends to cause vowels to assimilate to it in position. It is generally the other way around in English.

But whatever the phonetic character of /r/, its phonological character certainly demanded that it be specified /+ grave - diffuse/ in the older

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theory. It belongs to the class of consonants Reichard calls <u>faucalizing</u>. The faucalizing consonants are those that cause a preceding /i/, /e/, or /../ in the same word to be realized phonetically as  $fe_{1}^{2}$ ,  $fa_{1}^{2}$ , or  $fo_{1}^{2}$ respectively. The other members of the faucalizing class are /R/ and the velar consonants /o  $q^{0} \ge q^{0} \equiv q^{0} \le w'$ . These latter, like /R/, are noturally assigned to ff grave - diffuse in a language that has four contrasting positions of articulations for stops as does Coeur d'Alene.

But even though justified phonetically and phonologically, the classification achieved by this older feature system does not allow a very revealing discussion of the striking articulatory similarities between /r/ and /R/. The newer features framework presented in Chomsky and Halle (1968: 293-329) permits a much more insightful description of the articulatory nature of these sounds. It achieves this principally by making available a means for characterizing secondary articulations in a natural way.

In the terms of this newer framework, both /r/ and /R/ should be marked /-consonantal + sonorant - masal - syllabic. That is, they are both liquids. What appears to distinguish them is the feature / coronal.7.

Pharyngeal liquids are presumably to be specified in the same way as pharyngeal consonants with respect to the features  $\int back 7$  and  $\int tow 7$ . Thus they are specified  $\pm$  for both. Pharyngeals are marked  $\int -high 7$ . Hence /R/ is  $\int -high + 1$ ow + back 7.

And given its articulating characteristics, the most natural classification of /r/ with respect to these features is the same as for /R/ \_high + low + back7. We have already commented briefly on the lowness and backness of /r/. But further comment is in order. With respect to the feature /low%, the tongue body is much lower than the neutral position in articulating /r/. The neutral position is roughly that for the vowel  $f \ge 7$ . The lowness  $\rightarrow f /r/$  is not without its phonological consequences. Note that the faucalizing sounds lower  $f \ge 7$  to  $f \ge 7$  and  $f \le 7$  to  $f \ge 7$ . And with respect to  $f \ge 7$ , it is clear that the tongue body is retracted from the neutral position. This explains the retraction of  $f \le 7$  to  $f \ge 7$  before faucalizing sounds.

In terms of the new distinctive feature theory a sound with coronal articulation and with the features  $\int Iow J$  and  $\int Back J$  superimposed is categorized as pheryngealized. Thus it is the secondary features of /r/ that link it with /R/, not its primary articulation. It is the latter that had to be claimed by the older theory, and that is partly why the older theory was wrong.

It is important to note that while allowing a more penetrating phonetic analysis, the new features framework does not take away the possibility of a simple phonological account of the behavior of these sound types. In fact, in terms of the new theory the faucalizing consonants are slightly easier to characterize. They are just the consonants which share the feature [7 back]7.

The articulatory similarities between /r/ and /R/ lead one to suggest that is is not implausible that latter developed out of the former. It seems reasonable to consider the possibility that /R/ developed as an allophone of /r/ in some historical period, then was made phonemic in one of the various ways in which allophonic differences are established as phonemic. Of course the possibility is open that /r/ developed out of  $/R_{\rm c}7$ , but somehow this seems very unlikely.

The difference between  $\int r \mathcal{J}$  and  $\int R \mathcal{J}$  with respect to the tongue is,

as we have said before, that the tongue tip is elevated in  $\int r_{-}^{-} r_{-}^{-}$ , but not in  $\int R_{-}^{-} r_{-}^{-}$ . The change from /r/ to /R/ requires but one feature modification. With the single feature change from /F coronal 7 to 7 coronal 7 a Coeur d'Alene type  $\int r_{-}^{-} r_{-}^{-} r_{-}^{-}$  could become 7 R\_7. But this one feature change would have a fairly large impressionistic (and acoustic) effect in as much as it would establish a formerly secondary articulation (pharyngealization) as primary.

Further, if the foregoing speculation is correct, the air pressure formerly necessary to operate the trill could explain the tenseness of the other /R/. The air pressure could manifest itself as an <u>h</u> - like breathiness after the change in position of the tongue tip. A breathiness is often heard with the Cr /R/, especially in initial position.

Of course, this quasi-historical discussion is entirely speculative. It is not intended as a supportable historical account, but rather as an illustration of the close similarity of Cr /r/ and /R/.

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