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R

(R) as a Variable

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All sounds are variable, but some are more variable than others. Does **hyper**-variation mean a greater disposition for sociolinguistically relevant conditioning, or, alternatively, a tendency for relatively greater noisiness in the distribution of unconditioned variants? Whatever the case, there should clearly be a special interest in the sociolinguistic systemization of those sounds that are so unusually prone to variation that it is difficult to capture them within a simple articulatory and acoustic definition. Such is the case with the sociolinguistic variable (R).

About three-quarters of languages have at least one /r/ phoneme (Maddieson, 1984), but since the class of rhotic sounds is widely acknowledged to be very varied, the definition of /r/ must be flexible, and the definition of ‘rhoticity’ is rather heterogeneous and perhaps even somewhat arbitrary (Ladefoged and Maddieson, 1995). The fundamental problem arises from the tension between a simple phonological claim that “language L has a phoneme /r/,” the fact that /r/ tends to be an isolated phoneme rather than a member of a larger natural class, and the astonishingly nondeterministic correspondence between an /r/ and the crosslinguistic range of possible phonetic exponents involved. Moreover, some of the phonetic sounds concerned (e.g., velar fricatives) behave systematically as nonrhotics in other languages. Indeed, pedagogic texts often rely on such correspondences to teach pronunciation (e.g., the sound of French /r/ is like the sound at the end of the Scottish pronunciation of ‘loch’). The use of the wrong /r/ sound can create the impression of a very strong foreign accent for those learning standard varieties, but tolerance in the face of idiosyncratic variation and/or the acquisition and use of sociolinguistically conditioned variation seems to be the norm among native speakers.

Although variability is even more characteristic of vowels, vowels occur as members of a larger system

and can freely, in time, change phonological identity as they change phonetic quality from one location to another. However, the single label /r/ is used for a much wider and emptier phonetic space. We can thus understand John Walker’s rather pejorative-sounding opinion from 1791 that in English /r/ is “the most imperfect of all the consonants” (Harris, 1994: 230).

Nevertheless, there are some grounds to identify rhotics as a natural class. First, a number of phonetic sounds can be and have been classed as **exclusively** rhotic, especially (nonlabial) trills and retroflex approximants. Second, diachronic change can be seen to affect the phonetic characteristics of rhotics without leading to their loss as a contrastive element, giving rise to wide crosslinguistic variation in the form of the same rhotic in related languages. In Western Europe, for example, cognate words can employ alveolar or uvular trills, as well as labials, dentals, alveolars, velars, uvulars and labiodentals (fricatives and approximants), and even vowels. These various forms (apart from the last: cf. Barry, 1995) are usually regarded as the result of phonetically superficial and not phonologically meaningful changes. Third, structurally conditioned allophony and variability of the /r/ within a single language reinforce the correspondence of heterogeneous phonetic variants to the same phoneme. Analogous to the diachronic situation, the phonological system of a single language can lead us to postulate a single phoneme /r/ (superficially being voiced or voiceless, fricative, tap, or approximant). Fourth, sociolinguistic conditioning of variation in a rhotic is common within a language. Fifth, developmental data often show a range of exponents of /r/ from infancy into adulthood.

It is important to understand the descriptive phonetic nature of rhotic variation, though we need not worry here about the deeper question of why such an apparently disparate set of sounds is related (see Ladefoged and Maddieson, 1995; Barry, 1997). Without some phonetic preliminaries, it is hard to appreciate an understanding of sociolinguistic conditioning of (R) in any particular situation, and, moreover, it is hard to see the extent to which any findings may transfer from that situation to another with the

'same' variable (R): such a comparison may make very little sense. The next section, therefore, is a review of the wide range of phonetic variation of rhotics. It should be clear that /r/, because it is prone to vary in many and subtle ways, should both be an opportunity and a challenge to variationists. Then the ground will be clear to move on to more concrete detail of sociolinguistic variable (R), mainly in the context of British English.

What Can Be an /r/?

In general, the label /r/ seems to be applied to oral lingual sonorant consonants unless they are specifically palatal, lateral, or labial. It is hard to avoid the feeling that /r/ is therefore something of an 'elsewhere' category. If it were not for the fact, mentioned above, that it is often possible to provide phonological, sociolinguistic, diachronic, or acquisitional justification for the establishment of the category, it would be tempting to acknowledge 'r/' to be a rather meaningless label. For phonological theories favoring underspecification and featural analysis, the problem is to choose an appropriate abstract feature for /r/, derive common and uncommon aspects of its phonological behavior from this abstract specification, and then explain why the phonetic realization of this abstract /r/ is both systematic and arbitrary. For theories positing highly detailed mental representations, the problem is to explain how an abstract category /r/ is formed from articulatory and acoustically diverse input.

From the point of view of discussing the phenomenon of rhoticity, however, 'r/' or '(R)' are labels as good as anything else, so long as we recognize the descriptive and theoretical limitations arising from the use of this convenient international phonetic alphabet or orthographic symbol.

In looking for a more realistic description of rhotic sounds, we should refer first to Lindau's influential acoustic crosslinguistic study of rhoticity (Lindau, 1985) and to the excellent Ladefoged and Maddieson (1995: Chapter 7). Lindau's starting points were, on the one hand, the heterogeneity in the phonetic characteristics of /r/ crosslinguistically and its allophonic heterogeneity, and on the other, the phonological homogeneity of the distribution of /r/ and of the effects of /r/ on neighboring segments, especially vowels.

In looking at about a dozen phonetic types of /r/ from multiple speakers of four Indo-European languages and in a more varied range of seven West African languages, Lindau demonstrated some of the similarities and differences that can be found for some common rhotic sounds. The phonetic details are relevant to an understanding of rhoticity in itself, and as

a pointer to the type of fine differences that can be learned and therefore function sociolinguistically. For example, the ways in which uvular and apical trills are distinguishable acoustically do not seem much clearer than the ways in which apical trills can differ. With respect to the spectral patterns of the trills, the third spectral peak is quite low in Chicano Spanish, but "other forms of Spanish from Argentina, Colombia, and Mexico display a much higher third spectral peak than the Chicano Spanish, indicating a more dental place of articulation. The low third spectral peak in Chicano Spanish may be due to influence from English" (Lindau, 1985: 161). Thus, it is clear how the broadest detail for an /r/ may be adequate for phonological researcher, but even a relatively careful '[r]' or '[ɹ]' may be too coarse to indicate the existence of variation within a dialect or community: "even in languages where a possible realization is a trill, not all speakers use a trill, and the speakers that do, have tap and approximant allophones as well as the trill" (Lindau, 1985: 161). In her sample of trilling languages, about half the speakers produced trills. Spanish, with a tap-trill contrast, had a high proportion of phonetic trills, whereas only three of 10 Swedish speakers produced trills. This could have a phonological cause – namely that Swedish has only one rhotic phoneme – or a phonetic one, such as uvular trills being less easy than alveolar ones to produce consistently. Similarly, "taps are not produced in the same way in different languages, nor are they always produced in the same way by different speakers of the same language" (Lindau, 1985: 161). Ladefoged and Maddieson (1995) presented numerous further examples from a wide range of languages.

Lavoie (2001), in a highly detailed study of Mexican Spanish (and American English), also found some speaker variation, particularly in how weakened the trill was in a weak (nonprestress) position, but also a great deal of positional and random variation. She calculated variation in the trill and tap phonemes with respect to their manner of articulation. The Spanish tap phoneme was very variable in manner, while the trill was more consistent.

Further subtle variations are possible and can be observed. For example, in many languages, prepausal trills may be more or less devoiced. Greater or lesser amounts of epenthesis can occur between consonants and a following tap or trill, leading even to changes in the syllable count. And, of course, they may be in a rich variety of positional variation with nontrills.

Approximant /r/ is, of course, even more open to variation. It may be smooth, vocoid, and friction-free, indicating a constriction no tighter than that found in vowels and glides, and therefore characterized by

formant transitions of rapidly changing or fairly static character, largely depending on the vowel context and syllable position of the /r/. A retracted or retroflex approximant will have long transitions flanking it, particularly between it and a preceding high or front vowel, and these transitions can become like a diphthongization of the preceding vowel and help cue the presence of /r/ as much as reaching the target does. Thus a retroflex target can be replaced by a centering diphthong, and a correspondence between /r/ and schwa is established. Nonhigh vowels may, on the other hand, coalesce with /r/ and can result in a rhoticized vowel.

For approximant /r/, typically the third formant is lowered, compatible with pharyngeal and/or post-alveolar constrictions (Stevens, 1998). Indeed, these two constrictions have been observed in many articulatory studies, often together with lip rounding, which serves to lower both the second and third formants. Thus, we begin to see that approximant /r/ may be produced with multiple constrictions, or that alternative constrictions can be used, giving rise to broadly similar acoustic output. Articulatory complexity and flexibility are therefore characteristic of /r/ and perhaps are among the sources of its tendency toward variation and change.

While anterior approximant /r/ can also be rather fricated, frication is a more typical characteristic of non-trilled uvular and velar /r/. They range widely in the degree of noise and devoicing. Finally, the anterior lingual configuration of a postalveolar approximant /r/ can vary between basically retroflex or bunched configurations.

In sum, there is no natural articulatory or acoustic class that is easy to define; nor is there a set of sounds (however constituted) that can be said to be exclusively rhotic. Taps and flaps can also be variants of stops, laterals, or nasals. A fricative may be the phonetic realization of a phonological rhotic but may also be, of course, a fricative. And while pharyngeal or labial /r/s seem to exist, more often than not, approximants in those regions are not classed as rhotics without further systematic reasons to do so. Lindau's conclusion that rhotics exhibit a Wittgensteinian familial resemblance remains the key insight to take into any sociolinguistic study of (R).

Sample Studies of (R)

English is not unusual in having an /r/, in having only one rhotic phoneme, or in having stronger and weaker variants of it in relatively predictable phonological contexts. Indeed, in the Germanic context it is one of a number of languages (German, Dutch, Danish, Swedish) with both rhotic and nonrhotic

dialects. The so-called r-less or nonrhotic dialects do not lack an /r/ altogether. Rather, /r/ is, in broad terms, missing from syllable codas in nonrhotic dialects. Like vowel variation, (R) in the English-speaking world can therefore be a useful variable for the sociolinguist and indeed has appeared in a number of studies, including foundational work in the field (Labov, 1966; Labov, 2001). Although the focus here is on accessible reports of English variation, we should note that there are a few very large-scale studies in other languages that specifically address (R). A fair bit of work has been done on Dutch, most notably the ongoing 'Hema' project under the direction of van Hout, Van de Velde and Zonneveld (cf. Sebrechts *et al.*, 2003). (See also the attached multimedia materials collected in collaboration with Sebrechts.) For French, there is a major project 'La phonologie du français contemporain: usages, variétés et structure' under the direction of Durand, Laks and Lyche (cf. Delais-Roussarie and Durand, 2003). (See also Chevrot *et al.*, 2000; the hard-to-obtain Van de Velde and van Hout, 2001; and a successor volume in preparation; Gordon, Campbell, Hay, Maclagan, Sudbury and Trudgill, 2004; Hay and Jannedy, forthcoming, with more on (R) in New Zealand.)

The situations in North America, Scotland, and Ireland are rather different from the situations in other English-speaking regions. They are predominantly rhotic systems in which rhoticity is associated with prestige or standard speech. Elsewhere, however, nonrhotic speech tends to be the standard. It is useful, therefore, to examine the systems found for (R) in the British Isles, for example, since it is not only representative of both directions of variation, but the locations are also close enough that there is likely to be some tension and mutual influence. Variation in the United Kingdom is long-standing, as is evident in, for example, the *Survey of English dialects* and sources therein (Orton and Dieth, 1962a, 1962b; Upton and Widdowson, 2004). Walker (1791) noted alveolar and uvular trills and even nonrhoticity in London, where the /r/ was "sometimes entirely sunk" (Harris, 1994: 231).

Sociolinguistic studies of /r/ are concerned with phonetic variation in /r/, variation in the phonotactic distribution of /r/ (and other segments conditioned by /r/), and, crucially, the interaction between the two. Loss of coda /r/ ultimately means vocalization and leads to an expanded vowel system and/or mergers. The loss of coda /r/ results diachronically from progressive phonetic weakening of more consonantal productions until the productions are at first similar to vowels, then merged with them. Exactly how the reduction in the phonetic rhoticity of /r/ interacts with

an increasingly merged set of vowels before /r/ is still unclear, but it is likely that breaking, in which the vocalic transitions into /r/ gain in salience, is often involved (Wells, 1982; Barry, 1995).

Yet different rhotic accents of English can have larger or smaller vowel inventories before /r/, making /r/ responsible indirectly for yet more variation. For example, while some rhotic American accents merge 'Mary,' 'merry,' and 'marry,' rhotic Scottish accents tend to preserve these distinctions, as well as keeping 'horse' and 'hoarse' distinct. Scottish English has perhaps the fewest number of vowel mergers before a phonetically consonantal /r/; this makes it a particularly interesting accent for internal reasons, as well as on account of its social and geographic proximity to nonrhotic Standard Southern British English. In Scotland, many speakers of Standard English have a basic 12-vowel system and merge only /l/ and /ʌ/ before /r/ ('fir' and 'fur').

Even in rhotic accents, weak syllables are apt to lose /r/, especially before a consonant word internally ('surprise,' 'forget') or in frequently used word-final sequences ('other than'). In Scotland, the general phonotactic profligacy of coda /r/ attests to the survival of a more strongly consonantal coda /r/ than many other British varieties, but one that is, nevertheless, beginning to weaken from the coda into the nucleus structurally, as it has weakened phonetically in previous generations. The (contextually devoiced) trill or tap so consciously caricatured by Scots themselves as well as by outside observers seems largely gone, having been replaced by an approximant among younger and less vernacular speakers. Variation as a result of structural factors is common too. A speaker may have a lingual approximant /r/ (retroflex or alveolar) generally in onsets, but affricates in /tr/ and /dr/ clusters, and a tap in labial clusters such as /br/. Emphatic stress can result in a higher frequency of occurrence of taps and trills.

Recent sociolinguistic research in Scotland has shown how /r/ varies, and by implication how it is changing phonetically and socially. It may be, indeed, that such work reveals the early stages of the change toward phonological nonrhoticity. It is far from obvious that this is a simple change from above under the influence of Standard Southern British English. Such a change has been predicted among professionals and laypeople alike, given the high degree of nonrhoticity among children of English incomers, who tend to be middle class, causing loss of /r/ through contact. Such direct influence has been particularly obvious to many informal observers of middle-class speech in Edinburgh, in which Scottish Standard English shades off into clearly English-influenced accents (see Romaine, 1978).

It is therefore most important that a quite different and surprising behavior was confirmed by Jane Stuart-Smith's variationist examination of the English of Glasgow, the largest city in Scotland. Glasgow accents are stigmatized by Scots and non-Scots alike due to its strong Scots vernacular character, and Glaswegians display a great range of variation as a consequence. In Stuart-Smith's fieldwork (undertaken in 1997), 32 speakers were studied, bisected into groups of male and female, younger (13 or 14 years) and older (40 to 60 years), and working and middle class. Both spontaneous and word list speech was collected. In Stuart-Smith (2003) the results were compared to two previous important datasets collected by Macaulay (in 1973) and Macafee (in 1984–1985), which provide real-time support for Stuart-Smith's apparent time study, and to previous variationist work with more of a focus in Edinburgh by Romaine in the 1970s and by Speitel and Johnston in the 1980s, both of whom provided some earlier indication of variation in (R), including vocalization in working-class speakers (e.g., Romaine, 1978; Johnston, 1997).

The important point about this work is that the situation is far more complex than might be expected. While nonrhoticity has been spreading slowly across the United Kingdom for centuries, although perhaps more slowly than generally thought (Gordon *et al.*, 2004), rhoticity has seemed relatively secure and prestigious in Scotland. On the other hand, phonetic weakening of /r/ to an approximant in Scottish Standard English is extremely widespread. Indeed, although it is typical of a phonological or phonetic variable like (R) to be gradient, the behavior here is approaching categoricalness.

The 1997 Glasgow study made it clear that there has been both a loss of postvocalic phonetic rhoticity and phonetic variation in the realization of /r/. While nonrhotic patterns are **not** particularly evident in middle-class speech, the same cannot be said for working-class speech. Unsurprisingly, the range of variants transcribed is large. Common variants include central approximants, retroflex approximants, alveolar taps, retroflex taps, and vowels. Less common variants include alveolar trills and uvular fricatives.

First, Stuart-Smith reported an analysis of /r/ in all positions in the word list data, plus a 10% sample of the spontaneous speech. In the read speech, working-class girls formed a group on their own that was statistically distinct from all middle-class groups. Their main characteristic was a complete avoidance of retroflex approximants and heavy use of vocalization for coda /r/. Additionally, tendencies were noted across read and spontaneous speech. Younger and older working-class women seemed to differ,

while young working-class women resembled young working-class men. They both vocalized a great deal and avoided retroflex approximants. For all speakers, alveolar taps were well-represented, but trills and retroflex taps are almost absent.

Second, Stuart-Smith presented a more detailed study (all spontaneous data for all subjects in addition to the word list data) of coda /r/ and its vocalization. It was examined with respect to various phonological subenvironments. Preconsonantal and word-final /r/ were examined separately, and the latter was subdivided into two independent groups, namely stress (/r/ in a lexically stressed versus unstressed syllable) and structure (prepausal, preconsonantal, and prevocalic).

The extensive number of phonetic variants were allocated into what I will call rhotic, vocalic, intermediate, modified vocalic, and rhoticized vowel categories. In general, middle-class speakers used a rhotic consonant, while working-class speakers used a far wider range of variants. The working-class teenagers, particularly the girls, favored vocalization. The polarization of the young working class and the other groups was most evident in the stressed prepausal position, for here vocalization was found at high levels for boys and girls alike. However, preconsonantly (e.g., 'card'), the working-class girls favored a plain vowel, but the working-class boys favored a modified (velarized) vowel. In unstressed prepausal syllables, the use of plain nonrhoticized vowels by the girls was almost categorical. This suggests the girls may have been closer to the merger of r-ful and r-less words and to phonological nonrhoticity, and were furthest from the rather homogeneously rhotic middle-class speakers. The use of modified vowels by the boys may have been the result of the preservation of velar, pharyngeal, or other dorsal secondary articulations, due ultimately to the gesturally complex nature of some speakers' approximant /r/. But since those who vocalized most tended to use plain vowels, those reflexes of /r/ may well have been evidence of a stage in the weakening of /r/, in which speakers' outputs contained a gesturally reduced but still identifiable /r/.

Future research will hopefully reveal the extent to which (R) is like other variables, both consonantal and vocalic, in Glasgow, as well as how the changes in /r/ have arisen and been transmitted.

A further issue brings us back to the problem of the phonetic variability of rhotics in the first place: the nature of the hard-to-discern articulatory underpinning of /r/. Instrumental acoustic analysis can help to uncover subtle sociolinguistic patterning, but in the case of (R), another technique may be able to shed more light on such questions – namely, articulatory ultrasound. The technique is noninvasive and offers great opportunities for use in the analysis of

spontaneous speech and in large-sample studies. See the associated multimedia files for examples of Dutch and Scottish speakers.

Ultrasound can provide tongue-surface movies of the midsagittal section of the tongue and can clearly reveal different articulatory strategies for anterior approximant /r/, even without detailed analysis. The multimedia files provide examples of two young adult middle-class speakers from the Edinburgh area with acoustically similar formant structure for /r/, and impressionistically similar /r/, have different underlying articulations. One has a retroflex or alveolar approximant with a tip-up articulation and, it seems, with no accompanying pharyngeal gesture. The other has a bunched or tip-down production with a clear post-alveolar constriction and a pharyngeal constriction. It may be that the use of modified-vocalic productions of /r/ in the 1997 Glasgow data indicate a posterior constriction, too. A stratified multisubject study with acoustic and ultrasound analysis is certainly feasible, whereas other articulatory techniques would be far more invasive and probably incompatible with unmonitored spontaneous speech.

In nonrhotic areas of the United Kingdom, one of the major phonological phenomena in English can be observed, namely 'r-sandhi' ('linking-r' or 'intrusive-r'). Despite its high frequency of use, the nonetymological aspects of intrusive-r are perhaps responsible for a certain amount of conscious awareness of the phenomenon and resultant social and stylistic variation. Foulkes (1997) conducted the first large sociolinguistic study of the phenomenon (in Newcastle-upon-Tyne and Derby), although other research has examined the phenomenon in prestige and broadcast English. In Newcastle, linking-r and intrusive-r were less common than in more southerly accents and were associated with middle-class speakers. The frequency of linking-r use among young working-class speakers was only approximately 40 percent, compared to about 80 percent of older middle-class speakers. The rate of intrusive /r/ use in working-class speech was only about 20%. Interestingly, style did not behave in this study in the way that it is normally assumed to work: middle-class speakers used **more** intrusive-r in word list reading than in spontaneous speech.

Another topic of much interest, especially in non-rhotic Britain, is the recent increase of strongly labiodental productions of /r/ (Foulkes and Docherty, 2000). A few decades ago, an adolescent or adult with such a variant would be seen as having an idiosyncratic or even pathologically delayed production (with some very specific sociolinguistic exceptions), whereas recent research revealed that, increasingly, a significant minority of young adults can be found

with labiodentals. Indeed, it is by no means an infrequent characteristic of younger professional broadcasters in the United Kingdom. Recent informal observation of nonbroadcasters interviewed on United Kingdom radio and television suggested that between 25 and 50 percent of speakers used a labialized /r/ at least some of the time, at least as judged by this retroflexed, rhotic, and Scottish listener. This impression echoes Peter Trudgill's 1983 Norwich data (Trudgill, 1988), where few subjects with clear labiodentalization could be said to use it ubiquitously or consistently strongly.

Intervocalic /r/ behaves rather differently from prepausal or preconsonantal /r/. Intervocalic position is a rhotic position, but may be prosodically weak, particularly if it follows a stressed syllable and precedes an unstressed syllable. So loss of intervocalic /r/ sometimes occurs (and see also loss of prevocalic /r/ in weak syllables, e.g., 'pretend'), but it is likely to be differently distributed than plain nonrhoticity. In England and the United States, high-frequency forms like 'very' can be found with an almost monosyllabic pronunciation, and in more formal lexis, such as 'heroin,' the /r/ may be merely a hiatus between the vowels with no percept at all of a consonant. In England, this type of production seems particularly common among users of labial /r/. It marks the phonetic low-point of rhoticity, in which /r/ can appear as even less than a schwa or vowel offglide, namely as a hiatus between syllables. Since nonrhotic English did not previously permit sequences of nonhigh vowel plus vowel (this being the trigger for r-sandhi), such ultimate weakening of /r/ to hiatus does not (yet) cause any mergers in those accents.

Labiodental /r/ provides yet more evidence of how phonetically heterogeneous the class of rhotics can be. With heavily labialized /r/, bilabial trills corresponding to the clusters /br/ and /pr/ can even be found.

Acoustic analysis by Mark Jones (personal communication) and my own ultrasound analysis show that 'labiodental' /r/ is at an end of a phonetic gradient that even in its most extremely labialized forms is quite distinct from /w/, that it is favored in labial contexts, and that it may be a result of the boosting and early onset of the labial gesture that is already present in approximant lingual /r/ in the United Kingdom. In other words, postalveolar and pharyngeal lingual gestures may still be present in a 'labiodental' /r/, functioning to distinguish /r/ from labial-velar /w/.

As an aside, in the 1997 Glasgow study (Stuart-Smith, 2003) no labialized /r/s were found outside labial contexts, and informal observation suggests that these variants appear only sporadically in rhotic and nonrhotic Scottish adults. Labialized /r/ and

nonrhoticity are, however, somewhat in evidence in child development in Scotland, as they are in the United States. However, such productions are not common, or at least were not so in the late 1960s, as evidenced by a large (510 subjects) standardized study (Anthony *et al.*, 1971) of children aged 3.0 to 5.6. Out of 510 productions, labialized /r/ was more common in /br/ (32 tokens in 'bridge,' 26 in 'toothbrush') than /str/ (22), /kr/ (18), or /tr/ (16). However, in /θr/, nonlabialised /r/ was very common, even after [f] (225 tokens). Only 15 tokens were [fw], and another nine were labial. Initial /r/ ('red') was only 86% 'correct' (i.e., trill, tap, or lingual approximant) by 5;6. Overall, 25 productions were [w], 12 were [vɪ], six were [ɥ], three were [v], and three were [βɪ]. Medial /r/ ('garage') was labialized in 38 tokens. Finally, nonrhoticity in a weak syllable ('soldier' and 'birthday') was so common that absence of /r/ was not even counted as an error.

Foulkes and Docherty (1999) collected reports from a number of sociolinguistic studies on urban varieties throughout the United Kingdom and discussed the various phenomena affecting /r/ with reference to in a number of cities. Focusing mainly on nonrhotic varieties, the following were observed. Labial forms of /r/ were found in London (where they are a long-time variant), Norwich, Milton Keynes, Reading, Hull, Newcastle, and Derby. In nonrhotic Newcastle, the standard approximant /r/ was supplemented by taps in intervocalic position, and the local Northumbrian 'burr' ([ɾ]) was rare and found only in rural areas. Generally, nonrhoticity and intrusive-r were the norm for accents with labialized /r/, especially among the young. In nonrhotic Derby (see also Foulkes, 1997), linking-r was categorical and intrusive-r present in about 55% of possible contexts, with no sociolinguistic patterning. In Sheffield, Cardiff, and Sandwell, the norms were non-rhoticity, a lingual approximant /r/ realization, and intrusive-r. Finally, it was noted that other phonological changes could increase the number of environments in which intrusive-r can operate. As well as after vocalized /l/ or before dropped /h/, reductions of full vowels to schwa resulted in intrusive-r, so words like 'window' varied, depending on whether a reanalysis of the final vowel as /ə/ had occurred, and the infinitive 'to' was also rather variable in its conditioning of an intrusive-r. Sandhi was particularly common in combined forms like 'gonna' and 'wanna.' Finally, in London, monophthongization of vowels in the MOUTH and GOAT classes may also have fed intrusive-r.

In North America, a primarily rhotic continent, a number of foundational and influential sociolinguistic studies have addressed (R) (see Wolfram and Schilling-Estes, 1998). It should first be noted that

taps and trills are uncommon in North America, presumably because an alveolar tap or flap is used for /t/ and /d/ in just those environments in which tapped /r/ is likely in British English, and although the mechanisms are not identical, if a tap were used in 'berry,' it might merge with 'Betty.' Tapping of /t/ and /d/ is not normally regarded as a rhoticization in the United States, and there appear to be no grounds, at present, for viewing it as such.

Nonrhoticity in American English originally reflected the accents of some of the early settlers from the British Isles. Recent changes, including the movement of large numbers of southern nonrhotic speakers to cities in rhotic areas, have meant that non-rhoticity is not only a geographical variable but also reflects ethnicity and class. Nonrhoticity in some urban settings is characteristic of speakers of African-American vernacular English (AAVE), and there, rhoticity can act as a socioeconomic marker, but unlike the United Kingdom, where nonrhotic speech is associated with prestigious varieties. Within the African-American community of Detroit, (R) exhibits gradual stratification, so that while only about 20 percent of upper middle-class speakers are nonrhotic, this figure climbs to approximately 70 percent for the lower working class, in a linear manner.

In New York, the social meaning of rhoticity has shifted in the previous half-century. Older speakers exhibit little class-based stratification, but younger speakers identify rhotic speech as more prestigious than nonrhotic speech. This is the converse of the British situation (at least, the English situation) as well as the converse of Southern Hemisphere varieties (Gordon *et al.*, 2004). So, nonrhoticity in the United States is beginning to be associated with rural and lower-class speech. This does not mean there are not pockets of prestigious nonrhoticity in the United States, and indeed specific locations have older upper-class nonrhotic speakers. The New York adoption and then loss of nonrhoticity as a prestige form are both, as it happens, 'change from above,' though separated by a couple of centuries and with reference to different prestige dialects: nonrhotic British English and rhotic American English, respectively. The Irish English of Dublin shows a similar pattern, in which the local vernacular is weakly rhotic but middle-class speech is strongly rhotic (Hickey, 1999).

In Philadelphia (Labov, 2001), the ethnic distribution of rhoticity is also finely drawn. Nonrhotic speech is characteristic of the African-American population (about 40% of the population), but it also appears to have been an indicator of Italian ethnicity, an effect that is in decline in apparent time. Unstressed (R) can often be nonrhotic across Italian and non-Italian communities, whereas in stressed

syllables, the distribution of nonrhoticity is more complex, being more ethnically determined and prevalent in older speakers.

Finally, rhotic accents acquire extra /r/ in contact with nonrhotic varieties. Thus words such as 'theater' and 'idea' can contain an /r/ in rhotic varieties like Scottish English, since speakers interpret the [iə] diphthong as corresponding to /ir/, and weak final syllables that are subject to /r/ sandhi can be reinterpreted as involving an /r/ (hence 'feller' versus 'fellow'). These forms are generally lexical oddities, but their use is likely to be sociolinguistically distributed.

In general, then, it seems that vernacular or non-standard varieties of English in the United Kingdom are driving more variation and change in a number of variables, including (R), than the prestige varieties of Scotland and England. Urban vernacular forms seem to be either on parallel paths of internal change, or influencing each other, to the extent of substantial change – even vocalization – of /r/ appearing in younger working-class speakers in the largest city in Scotland in remarkably large numbers.

See also: Gender; Laboratory Phonetics; Labov, William (b. 1927); Phoneme; Phonemic Analysis; Phonetics, Articulatory; Prestige, Overt and Covert; Sandhi; Scots; Sociolinguistics/Social Class; Sound Change; Speech Errors as Evidence in Phonology; Variation and Language: Overview; Vernacular.

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Radical Interpretation, Translation and Interpretationalism

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Donald Davidson's idea of **radical interpretation** gets its inspiration from W. V. Quine's account of **radical translation**. This article will deal first with Quine's view and then Davidson's before turning to the **interpretationalism** of Davidson's views and criticisms of thereof.

Radical Translation

W. V. Quine is generally suspicious of such mental notions as belief, intention, and meaning, preferring an austere behaviorist account of language use. Quine imagines a field linguist attempting to compile a **translation manual** that would pair sentences of her

own language with sentences of a language wholly unlike any she has ever encountered, unaided by dictionaries or local interpreters. In this scenario of **radical translation**, the linguist has access only to the bodily behavior of the speaker and to those objects and events that are manifest in the local environment. The best pragmatic procedure for the radical translator to follow, thinks Quine, is to try to correlate the speaker's utterances with their proximal stimuli – "surface irritations" (Quine, 1960: 22) of sensory receptors. If a given stimulus – say, that produced by a rabbit – can be correlated with a given utterance on one occasion – say, 'Gavagai!' – then the translator must try to reproduce similar stimuli in order to see whether they provoke similar utterances (find some more rabbits and point them out). Or, better, the translator may on various stimulus-occasions, similar and different, repeat the speaker's original utterance in the hope of eliciting terms for assent and dissent (point to