

PHONETIC FACTORS IN /r/-LIAISON USAGE: A FIRST REPORT

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ABSTRACT

Variability in /r/-liaison usage in non-rhotic accents of English has been explained by reference to linguistic, sociolinguistic and phonetic factors. This paper looks at two phonetic factors that might condition such variability: a) the type of vowel phoneme at the end of the syllable likely to make the link; and b) the presence/absence of /r/ at the beginning of that syllable. A corpus of Received Pronunciation (RP) English newscasts from the years 2004 and 2005 available from the BBC Learning English website [16] was investigated. Potential contexts were detected and analysed auditorily. The results show that intrusive /r/ is more frequent after back vowels than after central vowels and that the presence of /r/ in the syllable that would make the /r/-link does not seem to have a great effect on the presence of /r/-link.

Keywords: /r/-liaison, linking /r/, intrusive /r/, RP.

1. INTRODUCTION

For non-rhotic accents of English, *linking /r/* refers to the pronunciation of the letter <r> as an r-sound when followed by a vowel sound (e.g. *mo[re] or less /mɔ:r ə les/*). In these accents, a related phenomenon is that of *intrusive /r/*, or the insertion of an r-sound where historically there was not any and present-day spelling does not contain an <r> (e.g. *the idea[r] of /ðə aɪ'diə r ɒv/* or *l[aw] and order /ɔ:r ən 'ɔ:də/*). As the pronunciation of intrusive /r/ is not justified by the spelling, its use is somehow stigmatised. However, despite their differences regarding orthography and degree of social prestige, linking /r/ and intrusive /r/ - both often jointly referred to as /r/-liaison - share important features like the fact that both are found only when preceded by non-high vowels. In the case of RP, for instance, linking /r/ and intrusive /r/ are only found after /ɔ:/, /ɑ:/ and the final central vowels /ə, ɜ:, ɪə, eə, uə/ [4, 11, 14].

One relevant feature of /r/-liaison in non-rhotic accents of English is that the former exhibits

variability, documented for accents such as New Zealand English [8] or RP [2, 9, 11, 14]. Moreover, the literature available suggests the existence of a series of factors (e.g. linguistic, sociolinguistic, phonetic, etc.) that may influence variability in /r/-liaison usage patterns.

Among the phonetic factors that could condition variability in /r/-liaison usage is the type of vowel phoneme at the end of the syllable likely to make the link. More specifically, it has been stated that intrusive /r/ could occur more frequently after back vowels like /ɔ:/ or /ɑ:/ than after final central vowels [8]. This hypothesis stems from the fact that there are important acoustic similarities between rhotic approximants and back vowels like the presence of a low L2 [10, 13].

Another phonetic phenomenon affecting /r/-liaison usage could be the presence of /r/ at the beginning of the syllable likely to make the link as in *a [r]oa[r] of laughter* (linking /r/) or *Victo[r]ia[r] and Albert* (intrusive /r/). In these cases, /r/-liaison has been claimed to occur less often than expected [3, 10]. This could be motivated by the lack of preference for similar or identical sounds in the same environment. In fact, avoidance of two adjacent r-sounds is often mentioned as a typical case of dissimilation [1].

2. THE PHONETIC ASPECT OF /r/-LIAISON: AN EMPIRICAL STUDY

Given the apparent lack of empirical evidence available on the role of phonetic factors in /r/-liaison usage in the specialised literature, the aim of the present paper is to gain a better understanding of the influence of phonetic aspects on the variability of /r/-liaison usage patterns. More specifically, the questions investigated are: a) is intrusive /r/ more common after back vowels than after central vowels? and b) is /r/-liaison generally avoided when the syllable likely to make the link begins with /r/?

Based on general ideas expressed in the previous literature it is hypothesized that: a) intrusive /r/ will be more common after back

vowels than after central vowels; b) /r/-liaison will be generally avoided when the syllable likely to make the link begins with /r/.

2.1. Method

2.1.1. Data

269 texts available from the BBC Learning English website [16] from the years 2004-2005 were analysed. The criteria for a given text to be analysed were that: a) it should be read by a professional BBC newsreader; b) its newsreader should be an RP speaker; c) the name of the speaker should be identified; and d) the archives should be available both as audio files and as written texts when the study was conducted. These requirements ruled out 38 texts out of 307, so 88% of the BBC news archives was eventually fully analysed. This amounts to a total of nearly 50.000 words and around 4 and a half hours.

2.1.2. Speakers

The speech of 152 different RP newsreaders was analysed. They represent a more or less homogeneous group as far as social class is concerned if their professional activity is taken as a reference point. Speakers were classified as male or female. In general, the type of accent they have may be considered as Mainstream RP [14] or General RP [7]. No distinctions regarding whether speakers' accent was native or adoptive were made.

2.1.3. Procedure

The procedure involved copying the written version of the relevant texts from the BBC Learning English web page and pasting them onto a single word-processed document. The spoken version was then listened to. Any spoken words not contained in the written version were added to the latter or deleted from it (if not found in the spoken version). This guaranteed that the spoken and written versions contained the same words. Next, all potential contexts of /r/-liaison were identified. For the identification of potential contexts, the document was scanned both manually and using automatic word search facilities. Finally contexts were analysed auditorily for the occurrence/non-occurrence of /r/-liaison usage.

Auditory analysis was combined with spectrographic analysis of the relevant sound files when necessary. The *Speech Filing System* (SFS), a free program for speech research developed at UCL was used to carry out spectrographic inspection of the sound files.

2.2. Results and Discussion

The analysis of the corpus shows that the percentage of actual linking /r/ in the corpus is less than two thirds (58%) of all potential cases (i.e. 570 occurrences out of 984 potential cases). This relatively low percentage of linking /r/ could be due to either the careful, speech-conscious style of the news or to the tendency among some speakers to eliminate intrusive /r/ from their speech only "at the expense of eliminating linking /r/'s too" [15, p. 95]. The results also show that intrusive /r/ is not a very frequent phenomenon in broadcast RP; out of 165 potential cases, only 52 cases were found, which is less than a third (31.5%) of all potential cases (see Figure 1). This suggests that intrusive /r/ continues to be stigmatised (at least for the group of speakers analysed) given that, apart from etymological and spelling differences, both linking /r/ and intrusive /r/ are essentially the same phonetic phenomenon and there should not be great differences in percentage of use between both phenomena.

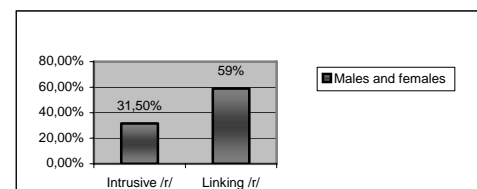


Figure 1. Difference between linking and intrusive /r/ (males and females combined)

The first research question investigated in this paper asked whether intrusive /r/ is less common after central vowels than after non-high vowels. According to the data analysed, the phonemic contexts after which an intrusive /r/ could have been inserted are /ə/ preceded by a consonant or a disyllabic stressed (/i:ə/) or unstressed (/i.ə/) vowel, a stressed diphthong (/ɪə/ and /eə/) or a back monophthong (/ɔ:/). No example of intrusive /r/ after /a:/ was found in the corpus despite the fact that the specialised literature often discusses /a:/ and /ɔ:/ together and offers as many examples of the former as of the latter.

The percentage of intrusive /r/ for each phoneme context is shown in Table 1. The table also shows that the percentage of intrusive /r/ after a central vowel is 27% (individual results of the different phonemic contexts identified in the corpus and females/males data combined). As the table also reveals, the percentage of intrusive /r/'s after /ɔ:/ (72%, males and females combined) is much higher than that of the central vowels combined (see also Figure 2), and the difference is statistically significant by a chi-square test ($X^2(1) = 15,142, p < 0.05$). A Cramer's V test (which tests the strength of association of the cross tabulations and whose values range from 0 -no association- to 1 -the maximum possible association-) shows though that the association is not very strong ($V = 0.305, p < 0.05$).

	Preceding vowel context	Potential cases			Intrusive /r/s			Percentage of intrusive /r/s		
		F	M	C	F	M	C	F	M	C
Back Vs	/ɔ:/	1	17	18	1	12	13	100	71	72
Central Vs	C + /ə/	21	80	101	5	21	26	24	26	26
	/ɪə/	0	5	5	0	2	2	--	40	40
	/i.ə/	6	32	38	1	10	11	17	31	28
	/i:.ə/	1	1	2	0	0	0	0	0	0
	/eə/	0	1	1	0	0	0	--	0	0
Combined		28	119	147	6	33	39	23	28	27

Table 1. Potential cases of intrusive /r/, actual occurrences and percentages by previous vowel context: data from females (F), males (M) and both groups combined (C).

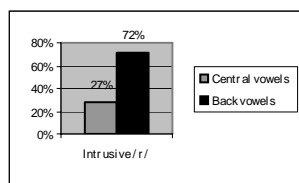


Figure 2. Percentages of intrusive /r/ use after central & back vowels (females & males combined)

The findings obtained, which confirm the hypothesis entertained in this study, could be interpreted as evidence of a greater acceptance of intrusive /r/ after vowels other than schwa. The specialised literature [e.g. 6, p. 34, 12, p. 30] has often claimed that stigmatisation is greater after /a:/ and /ɔ:/ because the lexical items in which they are found are less frequent so speakers' attention is drawn to these items, where they would try to avoid intrusive /r/ more than after central vowels. The results obtained, though, show the opposite pattern, suggesting that the greater use of /r/-liaison after back vowels may be due simply to the acoustic similarity between back vowels and rhotic

approximants since both are characterised by a low L2 [10, 13, pp. 288, 545].

The second research question aimed at finding whether /r/-liaison is generally avoided when the syllable likely to make the link begins with /r/.

Table 2 shows the number and rate of use of linking /r/ and intrusive /r/ in syllables that do and do not begin with /r/ (see also Figure 3). As far as linking /r/ is concerned, the corpus contained 15 potential cases in which the last syllable making the potential link begins with /r/.

The analysis of the results shows that linking /r/ is used in 5 cases (33%). This seems to support the claim that linking /r/ is "not as a rule inserted" [9, p. 112] when preceded by /r/ in the same syllable. Regarding intrusive /r/, the analysis also shows that there are 27 potential cases in the corpus in which the syllable likely to make the link begins with /r/ and 9 instances in which the link is actually made, which represents 33% of all potential cases.

Two standard tests were carried out to find out whether the differences in percentages were statistically significant: a Z-test for 2 sample proportions and a 95% confidence interval (CI) calculation (based on the properties of the binomial distribution).

A confidence interval shows that the differences between the rate of intrusive /r/ when the syllable making the link begins with /r/ (i.e. 33%) and the rate when the syllable does not begin with /r/ (i.e. 31%) are not statistically significant (2.17%, 95% CI = -17.21, 21.56%, $p < 0.05$). A Z-Test for 2 sample proportions also shows that the difference in proportions is not statistically significant at 95% (z -value = 0.222, 1-tailed $p = 0.412 > 0.05$, 2-tailed $p = 0.824 > 0.05$). These results seem to suggest that, if there is any tendency to avoid r-sounds in the nearby contexts, the effect is not clear for the corpus analysed for intrusive /r/. This may be due to the relatively few potential intrusive /r/ cases (i.e. 165) independently of whether the syllable that would make the link begins with /r/ or not and particularly due to the few cases of potential intrusive /r/ in syllables beginning with /r/ (i.e. 27).

Syllable Type	Linking /r/			Intrusive /r/		
	Potential cases	Actual instances	%	Potential cases	Actual instances	%
+ /r/	15	5	33	27	9	33
- /r/	969	565	58	138	43	31
Total	984	570	58	165	52	31.5

Table 2. Number and rate of use (%) of linking /r/ and intrusive /r/ in syllables that do not begin with /r/ (- /r/) and syllables that do begin with /r/ (+ /r/).

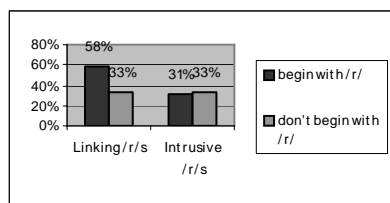


Figure 3. Influence of the presence of /r/ in the syllable preceding /r/-liaison.

Interestingly, the rate of linking /r/ when the syllable that would make the link begins with /r/ is the same (i.e. 33%) as the rate of intrusive /r/ in the same condition but the former is lower than the percentage of linking /r/ in syllables that do not begin with /r/ (i.e. 58%). This difference in percentages (i.e. 33% and 58%) is statistically significant (-24.97 , 95% CI = -49.03 , -0.92% , $p < 0.05$). A deeper analysis would reveal, though, that the distance between the upper interval (i.e. -0.92) and 0 is not great, so the difference in percentages is significant by very little. In fact, a Z-Test for 2 sample proportions indicates that the significance for difference in proportions is not statistically significant at 95% (z -value = -1.944 , 1-tailed $p = 0.026 < 0.05$, 2-tailed $p = 0.052 > 0.05$). The bilateral significance 2-tailed p value is 0.052 , which shows that the difference is not statistically significant by very little. As can be seen, the test performed reveals ambiguous results. If there is any tendency to avoid r-links with when an r-sound is at the beginning of the syllable what would make the link, this tendency is again not clearly revealed for linking /r/ in the data analysed. This might again be due to the few potential linking /r/ cases in syllables that begin with /r/ (i.e. 15).

3. CONCLUSION

Due to the scarcity of empirical evidence available on phonetic factors affecting variability in /r/-liaison usage patterns, the present study analysed the phenomenon of /r/-liaison in order to find out whether two phonetic factors, i.e. the type of vowel at the end of the syllable likely to make the link and the presence/absence of /r/ at the beginning, had any impact on /r/-liaison usage. In this respect, two research questions were investigated. For the first research question, the data obtained suggest that intrusive /r/ is more frequent after back vowels than after central ones. This, as pointed out above, may be due to the acoustic similarity between back vowels and post-alveolar approximants.

For the second research question, the results show that the differences of /r/-liaison usage between the rate of intrusive /r/ when the syllable that would make the link begins with /r/ and the rate when the syllable does not begin with /r/ are not statistically significant. In the case of linking /r/, the differences between the two conditions are also not statistically significant or ambiguous at best. These results may be due to the relatively few examples of potential /r/-liaison when the syllable that would make the link begins with /r/ found in the corpus. This suggests that the corpus should be expanded in order to obtain more conclusive evidence on this issue.

Another limitation of the present study is that it is confined to one single register, and, therefore, the results obtained in this research cannot be applied to all speech environments. Research on non-scripted speech should also be conducted. In addition, other phonetic factors that could influence variability in /r/-liaison usage should be investigated. These may include the presence/absence of stress in the linking syllable, the presence of intonational boundaries, etc.

4. REFERENCES

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