

R-Dissimilation in English

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1 Introduction

In many varieties of American English, it is common to drop one /r/ from certain words that have two /r/s, such as *su(r)prise*, *pa(r)ticular*, *gove(r)nor*, and *co(r)ner*. This type of /r/-deletion is done by speakers who are basically ‘rhotic’; that is, who generally do not drop /r/ in any other position. It is a type of dissimilation, because it avoids the presence of identical segments within the word. It is often regarded as a minor, sporadic, unpredictable process.

This paper has two goals. The first is to expand the description of American /r/-dissimilation by bringing together previously published examples with new examples from my own or other linguists’ observations. This data set, which is far larger than has appeared in any single source, reveals hitherto unnoticed generalizations: for example, dissimilation of /ər/ to /ə/ usually occurs between a labial consonant and a coronal consonant. These generalizations show that the pattern, while not fully regular, is less arbitrary than is usually assumed.

The second goal is to contribute to the long-running debate over why and how dissimilation happens, and particularly long-distance dissimilation. There is dispute over whether long-distance dissimilation is part of the grammar at all, and whether its functional grounding is a matter of articulatory constraints, processing constraints, or perception. Data from American /r/-dissimilation are especially important for this debate, because the process is active and non-morphologized, and occurs in a living language whose phonetics can be studied. Arguments in the literature are more often based on ancient diachronic dissimilation processes, or on processes that apply synchronically only in limited morphological contexts (and hence are likely fossilized remnants of once wider patterns).

In this case, I argue that the data support Ohala (1981)’s contention that dissimilation stems from perceptual errors, when a listener hypercorrects for perceived assimilation. English /r/ has drawn-out acoustic ‘resonances’ that can cause a listener to be unsure how many /r/s a word contains. Drawing on phonetic studies, I argue that /r/ tends to disappear precisely where it should be most phonetically masked by the presence of a second /r/. Resonances can also cause listeners to err on the side of perceiving too many /r/s, and this produces colloquial insertion of /r/ in words already containing an /r/, such as *farmiliar*, *perservere*, and *sherbert*.

There is no evidence that multiple /r/s at a distance are avoided in English in ways that could not be explained as perceptual errors, and hence, no evidence for a grammatical constraint penalizing multiple /r/s in the domain of a word.

However, this does not mean that all dissimilation is perceptual in origin. English also has a distinct process of short-distance /r/-dissimilation, in which the structure [rər] is avoided by a variety of means. I argue that avoidance of [rər] must be encoded in the grammar, because it affects morphological choices (*more sour* is preferred to *sourer*), which could not be a matter of perceptual errors.

2 Introducing the pattern

2.1 Sociolinguistics of /r/-dissimilation

There has been little study of the history of American /r/-dissimilation, or of its current geographical distribution. Dissimilatory dropping of /r/ has occurred in America at least since the nineteenth century, and likely earlier. The first description of the phenomenon by a linguist is that of Hempl (1893), based on his own Southern Michigan dialect. It was also sometime in the nineteenth century that the city of *Alburquerque* dropped the first /r/ from its name. Stephenson (1956) suggests that dissimilation was active in North Carolina in the eighteenth century, based on naive spelling patterns. Some writers drop only one *r* from *orcha(r)ds* (1730 and 1732), *gove(r)ner* (1781 and 1787), and *la(r)ger* (1799).¹

My impression, based on discussion with Americans from different regions, is that /r/-dissimilation (at least in unstressed syllables) is now common in most rhotic dialects of the US. There are few concrete data on this, however. The few examples of dissimilation that have been included in dialect surveys—*barbitu(r)ate*, by Bert Vaux; *ca(r)tridge* and *lib(r)ary* by Kurath & McDavid 1961—are all phonologically atypical (for reason I will discuss later) and probably lexicalized. Hence, they give little sense of how widespread the active process of dissimilation is in the U.S.

In general, /r/-dissimilation is not stigmatized in the U.S, in particular not when it occurs in unstressed syllables as in *gove(r)nor* (Wolfram & Schilling-Estes 1998:50, Merriam-Webster 1994:436, American Heritage:220). I have scanned many postings from internet discussion forums where the topic was ‘annoying mispronunciations’, and the only examples of dissimilation that are brought up frequently are *lib(r)ary*, *Feb(r)uary* and to a lesser extent *f(r)ustrated*. (For *February*, one finds complaints both about speakers who do and who don’t pronounce the first /r/. The pronunciation [ˈfebjuəri] is basically standard, and pronouncing the first /r/ can sound affected.) Dissimilation in stressed syllables seems to be rarer and perhaps more frowned upon than dissimilation in unstressed syllables.

¹I do not include *orcha(r)ds* or *la(r)ger* in the data sets below, because I do not consider spelling evidence alone to be sufficient. *Gove(r)nor*, on the other hand, is well-attested with dissimilation today.

Murray (1986:24) examines /r/-deletion in *qua(r)ter* as a sociolinguistic variable in St. Louis, Missouri, and finds that deletion is more common for lower class speakers and in less formal styles. Even for upper class speakers in a formal style, however, it occurs in 34% of tokens, so the level of stigmatization must be slight. Dissimilation may also be somewhat stigmatized when it involves loss of a syllable. Elster (1999), a prescriptivist, cautions against shortening *lab(or)atory*, and humorist Gene Weingarten, in a Washington Post column of September 17, 2006, describes how his editor ‘speaks like a man who grew up in the Land of the Lost Syllables. Tom takes his dog to the “vetinarian.” He looks at his reflection in a “meer.”’

For many speakers, /r/-dissimilation is the only cause of /r/-dropping, but for others, dissimilation may interact with other factors weakening /r/. Myhill (1988:207) studies Philadelphia speakers who have variable deletion of postvocalic /r/, due to competing influence from the white dialect of Philadelphia, which is largely rhotic, and Black English Vernacular, which is largely non-rhotic. He finds that speakers are significantly more likely to drop an /r/ if there is another postvocalic /r/ in the same word, a difference of .60% versus .40%. In a related study, Ellis et al. (2006) determine through a rapid anonymous survey that Philadelphians drop the coda /r/ in the street name *Gira(r)d* more often as that in the street name *Ma(r)ket*. /r/-dropping in *Gira(r)d* is dissimilatory, since the word has two /r/s, while /r/-dropping in *Ma(r)ket* is not dissimilatory but due to general non-rhoticity. They find that dissimilation interacts with race: black Philadelphians, who are less rhotic overall, are more likely to have a difference between *Market* and *Girard* than white Philadelphians are. This suggests that a general tendency towards non-rhoticity may reinforce the tendency towards dissimilation, but more sociolinguistic work is needed to confirm this.

2.2 Types of dissimilation

This section describes the main types of American /r/-dissimilation, which will form the basis of the analysis to follow (several other minor patterns will be mentioned later in the discussion). The number of examples brought together here is over four times larger than has appeared in any single source before, and this will allow us to see some hitherto unnoticed patterns. However, it should be borne in mind that these data come from a large number of sources, and there is not necessarily any variety of American English that has all the examples of dissimilation given here.²

²Sources are abbreviated as follows, with an indication if they describe a particular dialect. **S1837** Sherwood 1837:67-72; **H1893** Hempl 1893 (Southern Michigan); **R1906** Rippmann 1906 (British); **T1936** Thomas 1936 (upstate New York); **T1942** Thomas 1942 (downstate New York); **S1947** Swadesh 1947; **T1947** Thomas 1947; **W1982** Wells 1982a; **W1993** Wilson 1993; **M1994** Merriam-Webster 1994:436; **A1996** American Heritage Book of English Usage; **SW1997** Schilling-Estes & Wolfram 1997:65 (Ocracoke); **WS1998** Wolfram & Schilling-Estes 1998; **E1999** Elster 1999; **C2005** Canepari 2005; **G2006** barelybad.com/words1.htm#rsareus (largely Kansas City); OED *Oxford English Dictionary*; Eggcorn Database: archived at <http://eggcorns.lascribe.net>, accessed January 2007.

Dissimilation most often targets /r/ in unstressed syllables, usually next to /ə/. Table 1 contains examples where /ər/ dissimilates to [ə]. Table 2 contains examples where /rə/ dissimilates to [ə]. Some words from Table 2 may really belong in Table 1, and vice versa. The reason is that American English sometimes has metathesis of /r/ and /ə/, particularly after /p/ but also after other sounds. This metathesis has been active for a long time (Sherwood 1837's list of 'provincialisms' includes *perdigious*, *prevade*, *pervision* and *perserves*). Hence it is possible that in some cases, dissimilation arose in the metathesized form of a word rather than in the standard form. For example, it might be that ['sɛkəˌtəri] is derived from ['sɛkərˌtəri] rather than ['sɛkrəˌtəri]. There is no way to be sure which words exist in metathesized form, so I have grouped words according to their standard pronunciation.

There are also cases where dissimilation follows syncope. For the words in Table 3, it is possible to delete one of the parenthesized schwas without deleting /r/ (in many cases, I feel that syncope could delete either [ə]). Thus, although these examples might appear to involve dissimilatory deletion of a whole syllable if we compared the full forms to the dissimilated forms (i.e. 'læbərəˌtori versus 'læbətəri), dissimilation should actually be seen as operating on the syncopated form ('læbrətəri or 'læbətəri), and hence involves only dropping of /r/.

For some speakers, dissimilatory deletion can also occur in syllables that have primary or secondary stress, as in the words in Table 4. The greatest number of these cases involve a coda /r/ deleting after /o/ as in (4a), or /a/ as in (4b), or occasionally a stressed [ər] turning to [ə]. The restriction to these vowels is less remarkable when we consider that there are not many vowels that can appear in the position before rC in most American dialects. It is, however, possible to have /i/ in that position, and I am not aware of any examples of dissimilation after /i/, in words like *fiercer* ['firsər].³

There is an interesting problem about the quality of the vowel that is left after /r/ deletes in the words in Table 4. American /r/ has strong phonological and phonetic effects on preceding vowels. Many vowel contrasts are neutralized before /r/ (details vary by dialect), and some of the vowels that are permitted before /r/ occur as allophones that are more or less unique to that position. According to some descriptions (Swadesh 1947, Canepari 2005), these unique allophones survive when

Many individuals also have sent me examples. I have given their names only next to examples that were not found in recent scholarly sources. Examples with no source attributed are from my own observations. Incidentally, throughout the paper I will use a fairly broad transcription. This is partly because many of the sources quoted do not give phonetic transcriptions, and I do not want to offer misleadingly precise transcriptions of forms I may not have heard. I will transcribe the syllabic r sound as /ər/. This should be seen only as transcription convention, and is in no way crucial to the analysis.

³Deletion after stressed vowels is probably confined to certain American dialects. I have extensive dissimilation in unstressed syllables but feel I would not delete any of the /r/s in Table 4, and other speakers have offered the same intuitions. Reports of dissimilation in stressed syllables seem to be concentrated on New York, the North, and the rhotic South. Hempl (1893) described the speech of Southern Michigan; Swadesh was situated in New York; Canepari (p.c.) says that most of his data comes from the Albany to Milwaukee area and from the South; reports I have received through personal communication were from New York, Kansas City, and Baltimore.

<i>perform(ance)</i>	pə(r)'forməns	H1893, T1936
<i>perfumery</i>	pə(r)'fjuməri	H1893
<i>adversary</i>	'ædvə(r),səri	T1936, G2006
<i>aperture</i>	'æpə(r)tʃər	G2006
<i>Bernard</i>	bə(r)'nɑrd	C2005
<i>berserk</i>	bə(r)'zɜrk	G2006, B. Vaux
<i>bombardier</i>	ˌbɑmbə(r)'diː	G2006
<i>comforter</i>	'kʌmfə(r)rər	H1893
<i>forlorn</i>	fə(r)'lɔrn	T1936
<i>formerly</i>	'formə(r)li	H1893
<i>forward</i>	'fɔrwə(r)d	Wolfram (1969:111)
<i>governor</i>	'gʌvə(r)nər	T1936, W1982, W1993, M1994
<i>offertory</i>	'ɔfə(r),tɔri	M1994
<i>paraphernalia</i>	ˌpærəfə(r)'neɪljə	M1994, G2006, B. Vaux
<i>particular</i>	pə(r)'tɪkjələr	H1893, T1936, G2006, A. Zwicky, L. Hall
<i>perturbed</i>	pə(r)'tɜrbd	
<i>Purmort</i>	'pɜrmə(r)t	H1893
<i>repertoire</i>	'rɛpə(r),twɑr	G2006, D. Kamholz
<i>vernacular</i>	və(r)'nækjələr	M1994, G2006
<i>Albuquerque</i>	'ælbə(r),kɜrki	
<i>hamburger</i>	'hæmbə(r)gər	B. Erickson, B. Vaux
<i>afterwards</i>	'æftə(r),wɜrdz	H1893, T1936
<i>Canterbury</i>	'kæn(t)ə(r),bəri	C2005
<i>caterpillar</i>	'kærə(r),pɪlər	W1982, M1994
<i>elderberry</i>	'eldə(r),bəri	M1994, C2005
<i>enterprise</i>	'ɛn(t)ə(r),praɪz	H1893, A1996
<i>Otterburn</i>	'ɔtə(r)bɜrn	C2005
<i>reservoir</i>	'rɛzə(r),vwɑr	C2005
<i>surprise</i>	sə(r)'praɪz	H1893, T1936, W1982, M1994, G2006
<i>thermometer</i>	θə(r)'mɑmɜrər	H1893, T1936, W1982, W1993, M1994, G2006
<i>Waterbury</i>	'wɑrə(r),bəri	C2005
<i>northern(er)</i>	'nɔrðə(r)nər	H1893, T1936, C2005
<i>Southerner</i>	'sʌðə(r)nər	C2005

Table 1: /əɪ/ → [ə]

/r/ is deleted through dissimilation, so that *quarter*, for example, is [kwɔrɜr], with a first vowel unlike that of *quote* [kwɔʊt]. This would mean that American /r/-dissimilation creates a new [ɔ]/[ɔʊ] vowel contrast, despite claims in the literature that dissimilation is universally structure-preserving (Ohala 1993, Kiparsky 1995). This problem is discussed further below in section 3.5.

<i>impropriety</i>	,ɪmp(r)ə'praɪəri	A1996
<i>professor</i>	p(r)ə'fɛsər	T1936, C2005, SW1997
<i>proportional</i>	p(r)ə'pɔɪʃənəl	B. Samuels
<i>celebratory</i>	'sɛləb(r)ə'tɔɪ	G2006
<i>cerebral palsy</i>	,sɛrəb(r)əl 'pɔlzi	J. Hall
<i>frustration</i>	,f(r)əs'treɪʃən	
<i>infrared</i>	,ɪnf(r)ə'rɛd	B. Samuels
<i>infrastructure</i>	'ɪnf(r)ə'strʌktʃər	G2006
<i>interpret</i>	ɪntər'p(r)ət	G2006
<i>Labrador</i>	'læb(r)ədɔr	
<i>prerogative</i>	p(r)ə'rɒgəvɪv	G2006, B. Zimmer
<i>proliferate</i>	p(r)ə'lɪfəreɪt	SW1997
<i>progressive</i>	p(r)ə'grɛsɪv	
<i>entrepreneur</i>	,ɛnt(r)əprə'nʊr	G2006
<i>Tristram (Shandy)</i>	'trɪst(r)əm	
<i>fratricide</i>	'fræt(r)əsɪd	
<i>proprietress</i>	prə'praɪət(r)əs	G2006
<i>spectrogram</i>	'spɛkt(r)əgræm	
<i>photographer</i>	fə'tɒg(r)əfər	C2005
<i>stenographer</i>	stə'nɒg(r)əfər	T1947, C2005
<i>secretary</i>	'sɛk(r)ətəri	T1947, C2005, M. Gouskova

Table 2: /rə/ → [ə]

<i>laboratory</i>	'læb(ə)rə'tɔɪ	E1999
<i>preparatory</i>	'prɛp(ə)rə'tɔɪ	B. Vaux
<i>respiratory</i>	'rɛsp(ə)rə'tɔɪ	G2006, L. Hall
<i>temperature</i>	'tɛmp(ə)rətʃər	T1936, G2006, G. Toops, T. Adams, L. Hall
<i>literature</i>	'lɪr(ə)rətʃər	G2006, H. Schiffman, B. Vaux
<i>veterinarian</i>	,vɛt(ə)rə'nɛriən	G2006, G. Weingarten

Table 3: Dissimilation following syncope: one of the parenthesized schwas could delete without dissimilation.

Looking at the examples in Tables 2–4 together, we see that dissimilation is usually anticipatory: of 85 examples, there are only 8 where the last /r/ of the word deletes: *paraphe(r)nalialia*, *Purmo(r)t*, *cereb(r)al palsy*, *frat(r)icide*, *interp(r)et*, *propriet(r)ess*, *Trist(r)am Shandy*, *Gira(r)d*, and *forwa(r)d* (*forward* has also been reported with deletion of the first *r*, as shown in Table 4). In each of these exceptions, the preceding /r/ is either stressed or intervocalic, factors which decrease the chance of deletion. Despite being generally anticipatory, dissimilation never affects

a.	<i>corporation</i>	ˌko(r)pəˈreɪʃən	H1893, S1947
	<i>dormitory</i>	ˈdo(r)məˈtɔri	B. Flanigan
	<i>forward</i>	ˈfo(r)wərd	H1893
	<i>former(ly)</i>	ˈfo(r)mər	H1893, C. Moffatt
	<i>incorporate</i>	ɪnˈko(r)pəreɪt	H1893
	<i>corner</i>	ˌko(r)nər	H1893, S1947, WS1998
	<i>extraordinary</i>	ɛkˈstro(r)dəˌnəri	M. Gouskova, B. Vaux
	<i>Forster’s tern</i>	ˈfo(r)stərz ˈtɜrn	
	<i>northern(er)</i>	ˈno(r)ðə(r)nər	H1893, C2005
	<i>Northrup</i>	ˈno(r)θrəp	H1893
	<i>order</i>	ˈo(r)dər	C2005
	<i>ordinary</i>	ˈo(r)dəˌnəri	A. Dinkin
	<i>ornery</i>	ˈo(r)nəri	G2006
	<i>orthography</i>	ˌo(r)ˈθɑgrəfi	H1893
	<i>portrait</i>	ˈpo(r)trət	G2006
	<i>quarter</i>	ˈkwɔ(r)rər	H1893, S1947
	<i>warrior</i>	ˈwo(r)jər	G2006
b.	<i>farmer</i>	ˈfɑ(r)mər	H1893
	<i>farther</i>	ˈfɑ(r)ðər	H1893
	<i>Girard</i>	dʒiˈrɑ(r)d	A. Dinkin
	<i>parliamentary</i>	ˌpɑ(r)ləˈmentəri	H1893
	<i>parlor</i>	ˈpɑ(r)lər	H1893
	<i>Swarthmore</i>	ˈswɑ(r)θˌmɔr	goodmanhalvey2006
c.	<i>further</i>	ˈfə(r)ðər	C2005
	<i>murder(er)</i>	ˈmɜ(r)dərər	C2005

Table 4: Deletion in stressed syllables

a word-initial /r/; there are no examples of words like *river* turning to *[ɪvr̩].⁴

If we examine the consonants which flank the unstressed /(ə)r(ə)/ sequences that undergo dissimilation, an interesting pattern emerges, as shown in (1). In half of the words, a labial consonant precedes the sequence and a coronal follows. The second most common pattern is to have a coronal preceding and a labial following. Overall, more than two thirds of the words have exactly one labial and one coronal

⁴As for word-final /r/, Thomas (1942) reports a few cases where speakers in downstate New York delete only the final /r/ in the words *farmer*, *former*, *particular*, *percolator*, *temperature*, and *thermometer*. However, this is an area of mixed rhoticity, and for each word, the number of productions with only the second /r/ omitted is a very small percentage of the total number of productions, compared to cases where neither /r/, both /r/s, or only the first /r/ deletes. I assume that speakers who dropped the second /r/ were inconsistently applying a general rule of postvocalic /r/-dropping, rather than applying a specifically dissimilative rule that targeted the second /r/, and I do not include these examples in the lists.

flanking the /($\text{\textcircled{a}}$)r($\text{\textcircled{a}}$)/ sequence that dissimilates. Most of the rest of the words have two flanking labials or two flanking coronals; very few have even one flanking velar.

(1)	labial_labial	5	coronal_labial	12	velar_velar	0	total = 60
	labial_coronal	30	coronal_coronal	6	velar_labial	2	
	labial_velar	3	coronal_velar	1	velar_coronal	1	

Deletion of coda /r/ in stressed syllables occurs before a labial or coronal consonant. As shown in (2), there are no examples reported where /r/ deletes after a stressed vowel and before a velar consonant (e.g. *organizer*, *parker*, *worker*).

(2)	Place of consonants followed deleted stressed /r/	
	before labial	6
	before coronal	19
	before velar	0

The most common local context for deletion in stressed syllables is to have a preceding /o/ and following coronal consonant. Since /o/ is a labial vowel, we can say that deletion in both unstressed and stressed syllables tends to occur in a labial-coronal context.

In numerous cases, dissimilation leads to morphological alternations. Addition of a suffix containing /r/ often triggers deletion of an /r/ in the word stem. For example, deletion is possible in *gove(r)ner* but not *govern*; *adve(r)sary* but not *adverse*; *no(r)thern* but not *north*, etc. In other cases, an alternation is caused by stress differences in related morphological forms. Often a given /r/ will delete only if it is unstressed. Thus, deletion is possible in *'hambu(r)ger* but not *'cheese,burger* or *'burger*; *the(r)'mometer* but not *thermo'nuclear*; *p(r)o'fessor* but not *profe'ssorial*. Recall that although some dialects allow dissimilatory deletion in stressed syllables, it is only common when /r/ follows /a/ or /o/, which is not the case in the stressed forms mentioned here.

What makes these morphological alternations interesting is that they primarily affect roots rather than affixes. In a word like *farmer*, it would be possible, in principle, to avoid multiple /r/s either by deleting the root /r/ ('f $\text{\textcircled{a}}$ m $\text{\textcircled{a}}$ r) or by deleting the suffix /r/ ('f $\text{\textcircled{a}}$ r $\text{\textcircled{m}}$). There is a general cross-linguistic tendency for languages to prefer deletions and other changes in affixes rather than roots (in Optimality Theory, McCarthy & Prince (1995) instantiate this preference as a universally fixed ranking whereby faithfulness to root material outranks faithfulness to affix material). Yet in words like *farmer*, the root /r/ is deleted, in keeping with the typically anticipatory direction of dissimilation. In this way, morphological structure has less influence on American /r/-dissimilation than might be expected.

The domain of dissimilation appears to be the prosodic word. Morphological structure has little or no effect: dissimilation can happen in a mono-morphemic word like *tu(r)meric*, or across morpheme boundaries as in *fa(r)mer*. Some sources even describe dissimilation across morphological word boundaries. Canepari (2005) reports that /r/-deletion occurs in an unstressed function word when it is followed

by a word containing /r/, as in (3), although he describes dissimilation as ‘less systematic’ in this context than within words. Morphologically these phrases contain two words, but they are one prosodic word or ‘rhythm group’ in Canepari’s terms.

(3) Dissimilation in function words in some dialects (Canepari 2005)

<i>her heart</i>	hə(r)'hɑrt	<i>their firms</i>	ðə(r)'fɪrmz ~ ðe(r)'fɪrmz
<i>your mercy</i>	jə(r)'mɜrsi	<i>they’re dirty</i>	ðə(r)'dɜrɪ ~ ðe(r)'dɜrði
<i>our porch</i>	ɑ(r)'pɔrtʃ	<i>or here</i>	ə(r)'hɪr ~ o(r)'hɪr
<i>for word</i>	fə(r)'wɜrd		

Somewhat more surprisingly, Hempl (1893) reports dissimilation in the phrases *wa(r)m water* and *wa(r)m weather*. He does not give any information on the prosodic structure of these phrases, but these may be rare cases of dissimilation occurring over prosodic word boundaries.⁵

Within the prosodic word, dissimilation can occur over a fairly long distance. In *the(r)mometer*, *pa(r)ticular* and *ve(r)nacular*, the target and trigger /r/ are separated by two syllables. But Thomas (1935) suggests that dissimilation is more frequent in words where two /r/s are closer together, and statistics from Thomas (1936)’s study of upstate New York dialects support this claim. The frequency of dissimilation in particular lexical items is given in (4). The words in the left column contain two /r/s that are separated by a full vowel, and, in most cases, are in non-adjacent syllables. All of these words have a lower frequency of dissimilation than the words in the right column, where the /r/s are in adjacent syllables and no non-schwa vowel intervenes between them.⁶

(4) Frequency of dissimilation (Upstate New York, Thomas 1936)

	freq.	N		freq.	N
pə(r)'fɔrm	.33	39/120	'tɛmp(əɾə)tʃɜr	.78	93/119
pə(r)'tɪkjəlɜr	.45	75/164	sə(r)'praɪz	.81	220/271
θə(r)'mɑmɜrɜr	.47	68/144	'gʌvə(r)nɜr	.82	110/133
'fɛb(r)u,ɛri	.57	70/122			

Aside from this possible gradient effect of intervening full vowels, I have not noticed any clear examples of segments that block dissimilation. While in Latin, for example, dissimilation of /l/s is blocked by an intervening /r/, English /r/ dissimilation is not blocked by an intervening /l/, as seen by *pa(r)liamentary*, *pa(r)lor*, *pa(r)ticular*, *cate(r)pillar*, and *ve(r)nacular*.

In a word that contains three /r/s, it is possible for two of them to delete through dissimilation: Canepari (2005) reports [ˈnoðənɜr] for *northerner*. This may be cross-linguistically unusual; the typological study of liquid dissimilation in Walsh Dickey (1997:155), for example, lacks any examples of dissimilation affecting two out of three liquids.

⁵Hempl further speculates that the reason his dialect developed /r/-dropping in *Satu(r)day* and *yeste(r)day*, which have no second /r/, is due to dissimilation in common collocations such as *yesterday morning*, *Saturday afternoon*, etc.

⁶I have omitted seven other words for which Thomas collected only a small number of tokens, since the frequency of dissimilation is less statistically reliable in a small sample.

3 Dissimilation through misperception?

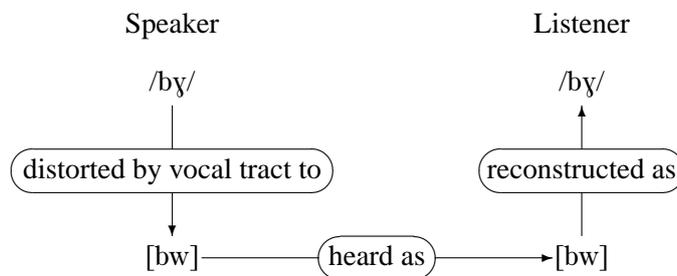
Having reviewed the characteristics of American colloquial /r/-dissimilation, I will now turn to the question of what causes it. I will argue that the most plausible theory is that of Ohala (1981), who proposes that dissimilation occurs when a listener **hypercorrects** for phonetic assimilation. This section will review the hypercorrection theory and relate its predictions to English /r/-dissimilation.

3.1 Hyper-correction

Ohala proposes that dissimilation and assimilation (as diachronic processes) both originate as mistakes on the part of the listener. These mistakes stem from the fact that the acoustic effects of certain phonological features tend to spread across adjacent sounds. For example, a consonant's place of articulation affects the formant transitions on neighboring vowels and consonants, and vowels affect vowels in neighboring syllables, even over intervening consonants (Öhman 1966).

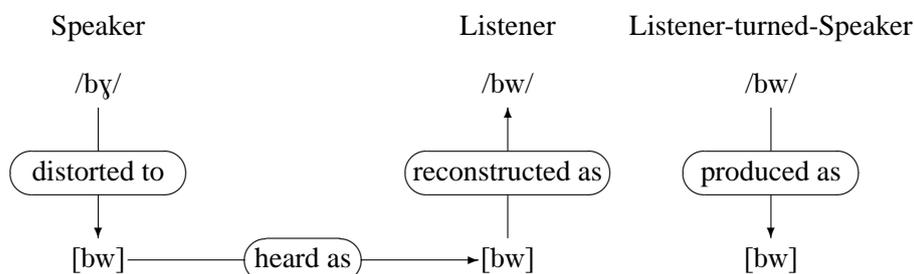
This coarticulation poses a problem for the listener. In order to correctly identify the intended utterance, the listener must learn to factor out coarticulation. For example, when a speaker produces a sequence of /bɣ/, the initial labial can make the following /ɣ/ sound like /w/. A listener, hearing an apparent [bw], must know how to correct for the coarticulation and deduce that /bɣ/ was intended, as shown in (5). (The following three diagrams are adapted from Ohala 1981.)

(5) Correction



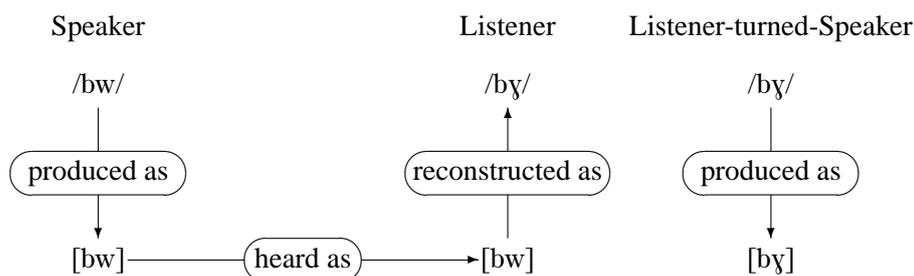
Ohala points out that there are two possible errors a listener could make. First, the listener could fail to factor out the coarticulation, instead taking the phonetic assimilation at face value. The result of this **hypo-correction** is phonological assimilation: the listener constructs an underlying representation in which the two phonemes agree on the coarticulated feature.

(6) Hypo-correction (assimilation)



The second possible error is that the listener could over-correct; that is, he could assume that coarticulation exists where it actually doesn't. Alert for the possibility that $/b\gamma/$ might be distorted by the vocal tract to sound like $[bw]$, he could make the mistake of assuming that a 'real' $[bw]$ is intended as $/b\gamma/$. The result of this **hyper-correction** is dissimilation: the listener constructs an underlying representation in which a feature that should be assigned to two phonemes is assigned only to one.

(7) Hyper-correction (dissimilation)



The examples above concern only sounds that are immediately adjacent, but Ohala argues that the same scenarios can account for assimilation or dissimilation at a distance as well, since some sounds can have very drawn-out acoustic cues. This claim remains controversial. In a recent evaluation of work on dissimilation, Alderete & Frisch (2006:8) argue that 'this analysis does not seem to work... in cases where the target and trigger of dissimilation are separated by more than a consonant or vowel', based on the assumption that coarticulation only spreads that far.

The alternative: dissimilation as a deliberate process Alderete and Frisch (and others) argue that long-distance dissimilation, like that described here, must have a different cause, such as phonological constraints against repeated elements within certain domains. There have been several formalizations of this basic idea, such as Alderete (1997)'s local conjunction of markedness constraints and Boersma (1998)'s anti-repetition constraints. I will summarize them as $*[r \dots r]_d$, defined below.

- (8) $*[r \dots r]_d$: Two [r]s do not occur within a domain *d*.

The constraint-based approach crucially differs from Ohala's in that it sees dissimilation as deliberate. According to Ohala, there is nothing inherently undesirable about multiple /r/s in a word, except that they give rise to perceptual errors. Speakers do not actively avoid multiple /r/s. But a constraint like $*[r \dots r]_{ProsodicWord}$ embodies the claim that multiple /r/s are actually marked and undesirable. Boersma (1998) claims that the phonology disfavors repeated articulatory gestures, while Frisch (2004) argues that repeated elements cause higher-level processing difficulties. Both see the avoidance of multiple /r/s (or other segments) as a goal-oriented process.

I will present arguments that the hypercorrective theory does account well for long-range /r/-dissimilation in American English. These arguments hinge on the fact that /r/ has been shown to have acoustic effects that range over several syllables. The constraint-based approach, on the other hand, does not deal well with certain aspects of the pattern. To be clear, this is not an argument against Optimality Theory or constraint-based grammars, but only an argument that American /r/-dissimilation is not caused by a constraint like $*[r \dots r]_{ProsodicWord}$. I will argue that other phonological constraints do play a small role in the development of dissimilation, but that the process is basically triggered the way Ohala describes, by factors outside the phonological grammar.

3.2 Long-range acoustic effects of English /r/

Several phonetic studies have shown that English liquids have extremely long-range acoustic effects and that listeners are attuned to these effects. These studies are primarily on British English dialects. While it would be ideal to have similar phonetic evidence from American English to compare with the primarily American data above, I will assume that long-distance effects of /r/ are likely to exist in American English as well.

Long-range acoustic effects of liquids were first reported by Kelly & Local (1986), who call these effects 'resonances'. Kelly and Local claim, based on impressionistic descriptions and visual inspection of spectrograms in three non-standard British dialects, that resonances are primarily a matter of F2 values, and have the domain of a phonological foot. The existence of long-range resonances is experimentally confirmed by Tunley (1999), who measures F2 and F3 values two syllables before and after liquids in British English. She finds that the presence of /l/ raises the F2 and F3 of high vowels, relative to a neutral /h/, while /r/ lowers the F2 and F3 of the vowels. West (1999a) presents an EPG and EMA study of a Southern British English speaker that finds similar non-local differences between /r/ and /l/, with lower F3, more lip rounding, and the tongue higher and backer preceding /r/ than /l/. Although none of the preceding studies examined vowels more than two syllables away from the liquid, Heid & Hawkins (2000) find even longer distance effects. In sentences like *We heard it might be a ram / lamb*, anticipatory

resonance effects were found five syllables away in the word *heard*, which was one second before the liquid.

Of course, the existence of long-range /r/-resonances is only relevant to the hypercorrection theory if listeners are able to perceive and interpret the resonances. West (1999b) shows that listeners can indeed use long-distance resonance effects to identify a liquid. Speakers of RP and Manchester English were asked to identify minimal pairs such as *belly* / *berry*, spoken in frame sentences, when varying amounts of the sentence, including the liquid, were deleted and replaced with white noise.

- (9) *No, I uttered berry today*
No, I uttered belly today
*No, I uttered b*****ay*

It was found that speakers of RP could identify /r/ correctly even when a time period corresponding to VrVCVC was obscured, as in the third sentence above (this was the longest period tested). This means that speakers are able to use resonance effects in vowels not adjacent to a liquid in order to identify that liquid.

Long-range resonances may help the listener to perceive that a word contains an /r/, but the spread-out quality of rhotics could also plausibly make it more difficult to tell how many /r/s a word contains, or where they are located. Hence, the existence of these long-range resonance effects makes the hypercorrection theory at least initially plausible as an explanation for English /r/-dissimilation. Furthermore, I will argue in the next section that the phonetic facts accord well with the particular characteristics of English /r/-dissimilation.

3.3 Explaining the pattern

The hyper-correction theory has a number of advantages for explaining the English pattern. It can offer principled reasons for why English dissimilates through deletion (rather than changing /r/ into another segment); why dissimilation happens more often next to certain consonants; why it occurs over a long domain; and why it is primarily anticipatory. The hyper-correction theory also correctly predicts the existence of a reverse pattern of perceptual hypo-correction, where one /r/'s resonance is misinterpreted as a second /r/. In English, this results in occasional insertion of /r/ in words that already contain an /r/, like *perservere*.

Why deletion? Cross-linguistically, dissimilation can occur either through deleting one of the repeated sounds, or through substituting one sound for another (as in Old French *marbre* > *marble*). Ideally, a theory of dissimilation should explain why deletion or substitution is used in a given language.

I suggest that segmental deletion occurs if a listener cannot detect the presence of the segment at all, while segmental change occurs if the listener can tell that a segment is present but cannot correctly identify it. Which type of error a listener is likely to make depends on the phonetics of the segments in the language

in question. In changes like *marbre* > *marble*, what probably causes listeners to misidentify /r/ as a different segment, rather than hearing the dissimilated liquid as simply missing, is that they recognize the presence of a time period associated with the liquid. The listener is aware that there is something between /b/ and /e/, either due to timing properties, or detection of some acoustic perturbation, or both. Thus, when the listener decides that the rhoticity heard on the second /r/ is really associated with the first /r/, he needs to posit a different segment to account for the time period and spectral changes caused by the second /r/. Having decided that the segment is not a rhotic, the listener chooses /l/ as most consistent with the phonetic properties he can detect. This would only be likely to occur in languages where /r/ has a fair degree of phonetic similarity to /l/, of course (and in the case of ancient languages, we can only speculate).

But we do know about the phonetics of American English, and in most of the American English words that undergo dissimilation, there is not a time period uniquely associated with the target /r/. We have seen that dissimilation most often targets unstressed /əɾ/ or /rə/. These sequences tend not to be pronounced with two distinct acoustic periods corresponding to the two phonological segments. Rather, /əɾ/ is phonetically a rhoticized schwa [ə̃], and /rə/ also tends to be a rhoticized schwa or something close to it in casual speech, although the break between /r/ and /ə/ can be more distinct in slow or careful speech. On a phonetic level, the segments /ə/ and /r/ are realized simultaneously. So if a listener, hearing /bərzər̃k/ pronounced [bə̃zər̃k], thinks that the rhoticity of the first syllable is an anticipatory resonance of the rhoticity of the second syllable, he mentally subtracts the rhoticity from the first schwa and is left with a plain schwa: [bəzər̃k]. Since the dissimilated /r/ had no time period to itself, distinct from the schwa, its presence is undetected and the word loses a segment.

Similarly, American postvocalic /r/ is phonetically weak. To my ear, there is a tendency in some dialects, like New York, to realize coda /r/ as rhoticity spread across the preceding vowel. If this is correct, then deletion of /r/ in stressed syllables can occur the same way as deletion of /r/ in unstressed syllables: the listener attributes the rhoticity of the vowel to a later /r/, and misses the presence of the coda /r/.

This theory predicts that dissimilation would occur through segmental substitution only in a situation where /r/ has a time period to itself. There are a few situations where this does occur in American English, resulting in minor dissimilatory processes that involve segmental substitution. First, some speakers⁷ change a morphological geminate /rr/, resulting from attachment of the negative prefix *ir-* to an *r*-initial adjective, to [lr].

⁷A Washington Post article of 10/10/88 quotes then-Senator Dan Quayle's response to a question about his parents' involvement in the John Birch Society: "Let me say it one more time. It is *ill-rele-vant*."

(10) Minor process I: /r/ → /l/ in morphological geminates

	Standard	Dissimilated
<i>irrelevant</i>	ɪr'reləvənt	ɪl'reləvənt
<i>irregardless</i>	ɪrri'gɑrdləs	ɪlri'gɑrdləs

Geminates are very rare in English, being allowed only at morpheme boundaries. Due to this rarity, a listener hearing an extra-long [r] sound may be biased to reject the possibility that he heard two adjacent /r/s. But in that case, he needs to substitute another segment to account for the extra duration. Influenced by the existence of the prefixes *ill-* and *il-* (as in *ill-regulated* and *illegal*), he may decide that he heard an /lr/ sequence in which phonetic assimilation produced the percept of [r].

Second, American /r/ can have a distinct time period when it is in the syllable onset. /r/ before a non-schwa vowel is not realized as rhoticity spread across the vowel; there are formant perturbations associated with the /r/ that are clearly distinguishable from the vowel. The same is sometimes true of /r/ before a schwa (especially in slow or careful speech). Hence, we predict that such an /r/ should be unlikely to disappear through dissimilation, but could be subject to substitution. In (11) are all the examples I have found reported where /r/ changes to another consonant in a word containing another /r/. And indeed, all but one example (*Purmort*) involve an onset /r/.

(11) Minor process II: /r/ changing to other consonants

	Standard	Dissimilated	
r → j			
<i>defibrillator</i>	di'fibrəˌleɪrər	di'fɪbjəˌleɪrər	G2006, B. Kennedy
<i>February</i>	'fɛbrʊəri	'fɛbjʊəri	S1837, H1893, G2006
<i>prurient</i>	'pruriɪnt	'pɜriɪnt	G2006
r → l			
<i>frustrate(d)</i>	'frʌsˌtreɪrəd	'flʌsˌtreɪrəd	S1837
<i>war-mongering</i>	'wɔːˌmʌŋgərɪŋ	'wɔːˌmʌŋgəlɪŋ	G2006
<i>fritters</i>	'frɪrəz	'flɪrəz	S1837
r → n			
<i>Purmort</i>	'pɜrmɔːrt	'pɜrmənt	H1893

It is striking that when /r/ changes to another sound, it very often does so in a way that creates a similarity to another existing word. Many people have noted that the [j] in *Feb[j]uary* is likely an analogy to *Jan[j]uary*. *Flustrated* is probably influenced by *flustered*, and some speakers feel it is actually a blend of the two words (meaning both frustrated and flustered), although other speakers consider the forms with /r/ and /l/ to be variants of the same word. *Defibulator* is similar to *fibula*, which is loosely related in the sense that both are medical words. *Flitter* is an existing word. *-Mont* and *-mort* are both common name endings. I would suggest that the phonetics of English sonorants are basically not conducive to mistaking /r/ for /l/, /j/, or /n/, but that occasionally the combined forces of dissimulatory masking and lexical influence conspire to create sporadic exceptions.

(It is also worth noting that some of these words are very old, as seen by the fact that Sherwood recorded them in 1837, and hence they may have arisen in dialects whose phonetics was unlike that of contemporary American).

This apparent influence of other words is consistent with the hypercorrective theory, in that top-down influence from the lexicon is known to affect phonetic categorization. A number of studies (e.g. Ganong 1980, Fox 1984) have found that listeners prefer to categorize acoustically ambiguous phonemes in a way that makes a real word: for example, a sound that is ambiguous between [d] and [t] is more likely to be heard as [d] in the context *-ice*, but as [t] in the context *-ype*. It is quite conceivable that speakers confronted with an acoustically ambiguous sonorant sound in a new word should also tend to categorize the sound in a way that makes the word identical, or similar, to a word they already know.

The hypercorrective theory would not predict that /r/ should be likely to delete before a full vowel in English, since the presence of a segment there should be relatively clear. However, there are a very small number of examples where this happens, as in (12). Deletion in some of these words is stigmatized (especially *frustrated* and *library*).

(12) Minor process III: /r/-deletion before stressed vowels

<i>frustrated</i>	'f(r)ʌs,treɪrəd	N. Slone
<i>librarian</i>	ˌlɪr'b(r)ɛriən	
<i>library</i>	'lɪr,b(r)ɛri	
<i>photomicrography</i>	ˌfoʊrəmaɪ'k(r)ɑgrəfi	Barrs (1962)
<i>camaraderie</i>	ˌkɑm(ə)r'ɑdəri	G2006
<i>prostrate</i>	'prɑs,t(r)ɛɪt	G2006
<i>prop(r)ietary</i>	pɹə'p(r)ɑɪətɛɪ	

The likely explanations for these exceptions are varied. *F(r)ustrated* may simply be a back-formation from *f(r)ustration*, where /r/-dropping occurs in the usual way in an unstressed syllable (see Table 2). /r/-dropping in *prost(r)ate* is likely a case of lexical interference from the existing word *prostate* (confusion occurs in the other direction, as well). *Lib(r)ary* is a form that occurs in other parts of the English speaking world (Rippmann 1906), and hence may not have arisen in American English at all.⁸

Incidentally, we can speculate that the reason dissimilation in these words is stigmatized is precisely because the dissimilated and non-dissimilated forms are very perceptually distinct. This makes it easy to notice when a speaker uses the non-standard form, unlike in words like *gove(r)nor*, where there is less acoustic

⁸*Lib(r)ary* is one of the most commonly cited cases of /r/-dissimilation, and this word is frequently compared to *contrary* (which does not have dissimilation) in order to demonstrate that dissimilation is irregular and unpredictable (Wolfram & Schilling-Estes 1998:51, Hock & Joseph 1996:141). As shown here, though, *library* is a phonologically atypical example of dissimilation. The regularities of the process are better revealed through examining the kinds of dissimilation seen in Tables 1–4.

distinction between the forms with and without the first /r/. Shibboleths need to be audible.

Thus, the hypercorrective theory gives a principled reason that American /r/-dissimilation generally works through deletion of /r/ in codas and unstressed syllables (and the theory also has something to say about the small number of exceptions noted above). The details of the dissimilation process relate to the particular phonetic characteristics of /r/ in English, and it would be predicted that any language with the same phonetic characteristics should show the same type of dissimilation. A theory that attributes long-distance dissimilation to a constraint **/r...r/ProsodicWord*, on the other hand, does not predict which mechanism English or any other language should use to satisfy this constraint. That would depend on the relative ranking of constraints against /r/-deletion versus constraints against changing /r/ to other segments. Since, for rhotic English speakers, there are no other phonological processes that drop or change /r/, it is hard to find independent support for ranking these constraints. The choice to achieve dissimilation through deletion rather than through substitution would have to be seen as essentially arbitrary, and without connection to the phonetics of English.

Effects of local context As pointed out in (1), local consonantal context affects the likelihood of an /r/ undergoing dissimilatory deletion. Dissimilation mostly happens where /ər/ or /rə/ is between a labial consonant and a coronal consonant, as in *ape(r)ture*. A similar pattern holds in stressed syllables, where the most common local context for deletion is a preceding /o/ (a labial vowel) and a following coronal consonant, as in *qua(r)ter*.⁹

I suggest that a local labial-coronal context helps mask an /r/ because it mimics the articulation of an /r/. American English rhotics are believed to involve three articulatory gestures: a raising of the tongue blade, a slight rounding of the lips, and a retraction of the tongue root. Labial and coronal consonants, obviously, involve articulations in roughly the same regions as the /r/'s lip rounding and tongue blade gestures. It has been argued recently that schwa also has an articulatory similarity to /r/, in that it involves tongue root retraction. Gick et al. (2002) show that, for some American speakers, schwa and /r/ have a very similar pharyngeal configuration (in fact, /r/ is more similar to schwa than to any other vowel in its postoral articulation). Hence, a combination of labial, schwa, and coronal articulations should put the vocal tract in a shape roughly similar to that which it assumes during an /r/. This would be particularly likely to happen in fast speech, where all three articulatory gestures may overlap.

The crucial effect of this simultaneous labial-coronal-pharyngeal configuration

⁹ The labial-coronal context may also be associated with sporadic deletion of /r/ in non-dissimilatory contexts. The pronunciations [θoʊ] for *throw* and [θu] for *through* are widespread in the South (Schilling-Estes & Wolfram 1997:65). These words involve /r/ disappearing between a coronal consonant and a labial vowel. Dialectal insertion of /r/ in labial-coronal context, as in *per(r)tion* (Sherwood 1837) and Southern Appalachian *wom(er)n* (Farwell & Nicholas 1993) could be part of the same pattern.

may be to help mask the *local* formant perturbations associated with /r/. Heid & Hawkins (2000) give evidence that the acoustic effects of /r/ consists of two components. There is a relatively large local perturbation of formants, and a long-range effect (resonance) that is smaller. We can speculate that usually, when a local context of labial, coronal, and pharyngeal elements obscures the local acoustic effects of /r/, the /r/ is still recoverable due to its long-range resonances which are heard on neighboring syllables. However, when there is another /r/ in the word which has overlapping long-range resonances, the first /r/ can be fully masked. In this way, the local and non-local contexts interact in producing perceptual dissimilation.

It is likely that the biggest contribution to local acoustic masking comes from the labial consonant. We have seen (section 3.2) that the primary acoustic effect of a rhotic is to lower F2 and F3. Labials also cause a lowering of F2 and F3 on adjacent vowels; it is typical for the vowels' formants to dip as they approach a labial consonant. The expected dip in formant values associated with the labial could help confuse the listener into not realizing that the formants are also dipping because of the presence of a rhotic.¹⁰

Thus, the hypercorrective account can draw a connection between the context of English /r/-dissimilation and the specific phonetics of English /r/. It is more difficult to satisfactorily explain the effect of the labial-coronal context if dissimilation is analyzed with the constraint *[r...r]_{ProsodicWord}. It is technically possible to conjoin this constraint with another constraint specifically penalizing /r/ next to labials and coronals, but this solution is both complex and ad hoc. I am not aware of any other phonological phenomena in English (leaving aside the four dialectal words mentioned in footnote 9) that would support the existence of a constraint against [r] between labials and coronals.

Domain and direction Under the perceptual theory, the domain and direction of dissimilation should also relate to the phonetics of /r/'s realization, specifically the domain and direction of long-distance /r/ resonances.

Heid & Hawkins (2000) show that /r/ resonances can extend as much as five syllables before the /r/, sometimes across several words, and through stressed syllables. It is expected, then, that dissimilation will operate over a similar domain, and this is indeed what we find. Dissimilation can occur over as many as two intervening syllables, including stressed ones, as in *the(r)mometer* or *pa(r)ticular*. Dissimilation also operates across word boundaries for some speakers, as in *wa(r)m weather* and *ou(r) porch*.

Heid and Hawkins also show that resonance effects decrease with distance from /r/, so it is predicted that dissimilation should be more likely to occur between /r/s that are close together. This seems to be correct; as shown earlier in (4),

¹⁰Incidentally, there are examples in other languages of labials influencing changes in rhotics. Grammont (1895) claims that dissimilation of /r/ to /l/ in Armenian happened only before /b/. Le Havre French has metathesis of /rə/ to /ər/ except before /f, v, m/ (Grammont 1909). Blevins & Garrett (1998:518) argue that this metathesis occurred through misperception. Their argument relies, like the analysis here, on the observation that labials and /r/ have similar local acoustic effects.

Thomas found a higher incidence of dissimilation in words where the two /r/s were not separated by a full vowel.

The perceptual account can also offer an explanation for why dissimilation is primarily anticipatory. There is some evidence that /r/ has stronger anticipatory than perseverative resonances. An acoustic study in West (1999b) found ‘robust anticipatory, not perseverative, resonance distinctions’ [419]. Heid & Hawkins (2000) found anticipatory resonances stretching five syllables, although they did not look at perseverative resonances. If the listener knows that anticipatory resonances are stronger and/or longer than perseverative resonances, then a listener confronted with a long-range stretch of rhoticity should be biased to believe that the rhoticity stems from a source late in the word. Hence, he should be more likely to miss an early /r/ due to masking from the resonances of a later /r/ than vice versa.

Hypo-correction: long-distance liquid spreading Another prediction of the perceptual account is that /r/ should sometimes be *inserted* in the same kind of contexts where dissimilation occurs. This may seem paradoxical, but it follows from the idea that dissimilation is a hyper-correction for phonetic assimilation. If listeners are capable of hyper-correcting, they should also be capable of hypo-correcting. As noted in section 3.1, hypo-correction is the error of failing to correct for phonetic assimilation, and instead taking it at face value.

Hence, the hyper-correction analysis of dissimilation predicts that we should find cases of assimilation that are exactly the reverse of a given type of dissimilation. Alderete & Frisch (2006) claim that this prediction is not borne out, because cross-linguistically ‘liquid dissimilation is extremely common. . . but liquid assimilations are vanishingly rare’. They identify liquid assimilation in Palauan (Josephs 1975) as the only possible known example. Alderete and Frisch suggest the rarity or non-existence of long-distance liquid assimilations is a problem for the perceptual theory of dissimilation.¹¹

However, I claim that American English actually does have assimilatory insertion of liquids. There are a number of cases where some speakers insert /r/ into words that already contain an /r/. Some examples are given in Table 5, with the inserted /r/ underlined. Most of these pronunciations are rarer than the cases of dissimilation discussed earlier, although *sherbert* has become fairly standard. This sporadic /r/-insertion has been hardly mentioned in the linguistic literature.

The assimilatory insertion of liquids seen in these examples is exactly the opposite of the dissimilatory deletion of liquids we have seen earlier. The examples in (a) involve insertion of an /r/ after, or occasionally before, an unstressed [ə]. This is the reverse of the dissimilation pattern seen in unstressed syllables in Tables 2–3. The example in (b) involve insertion of an /r/ after a stressed [ɑ] or [o], the reverse of the dissimilation pattern shown in Table 4. Just as dissimilation is

¹¹But see Poultney (1972) and Eckhardt (1938:96–97) for additional historical examples of long-distance assimilatory insertion of liquids in Indo-European languages. None of them are regular changes, but neither are most cases of dissimilation.

a.	<i>persevere</i>	ˌpɜrsəˈvɪr	E1999, G2006, J. Kammert
	<i>integral</i>	ˈɪntɪgrəl ~ ˈɪntəgrəl	G2006, P. Brians
	<i>familiar</i>	fəˈmɪljər	S1837, T1936, D. Kamholz
	<i>lavatory</i>	ˈlævəˌtɔri	J. Kammert
	<i>pejorative</i>	pəˈdʒɔrətɪv	G2006
	<i>photographer</i>	fəˈtɒɡrəfər	G2006
	<i>celebrity</i>	səˈlebrɪti	
	<i>veneer</i>	vəˈniːr	
	<i>categorize</i>	ˈkætəˌɡɔːraɪz	G2006
	<i>Kevorkian</i>	kəˈvɔrkɪən	
	<i>elevator</i>	ˈeləˌveɪtər	
	<i>barbecue</i>	ˈbɑːrbəˌkjuː	
	<i>sherbet</i>	ˈʃɜːrbət	Zuraw (2002), D. Kamholz
	<i>frustum</i>	ˈfrʌstrəm	M. Hall, OED
b.	<i>cotter (pin)</i>	ˈkɒtər	G2006
	<i>Covarrubius</i>	ˌkɒrvəˈruːbjəs	M. Covarrubius
	<i>Hawthorne</i>	ˈhɔːθɔːrn	E. Keer
	<i>author</i>	ˈɔːθər	C. Moffatt
	<i>vocoder</i>	ˈvoʊˌkɒdər	
	<i>Yuri Gagarin</i>	ˈjʊəri ˌɡɑːˈɡɑːrɪn	
	<i>mascarpone</i>	ˌmɑːskəˈpoʊn	B. Hassan
c.	<i>arduous</i>	ˈɑːdʒʊəs	G2006, OED
	<i>beneficiary</i>	ˌbɛnəˈfɪʃɪəri	G2006
	<i>contractual</i>	kənˈtræktʃərəl	Hench (1949)
	<i>fervent</i>	ˈfɜːrvərənt	G2006
	<i>pestiferous</i>	ˌpestəˈrɪfərəs	G2006
	<i>heart-rending</i>	ˈhɜːtˌrɛndɪŋ	Eggcorn Database
	<i>borogoves</i>	ˈbɔːrəˌɡroʊvz	
	<i>protuberance</i>	prəʊˈtʊbərəns	G2006
	<i>funeral</i>	ˈfʊnərəl (AAVE)	W. Gray
	<i>harbinger</i>	ˈhɑːbrɪŋər	Eggcorn Database

Table 5: Assimilatory insertion of /r/

primarily anticipatory, assimilatory insertion of /r/ is anticipatory in all but two of the words in (a) and (b). This is what the hypo-correction theory would predict, based on the fact that /r/-resonances are mostly anticipatory. An /r/ causes stronger /r/-coloring on the vowels before it than after it, so it is more likely that the listener will mistakenly perceive another /r/ earlier in the word than later. Several other examples, which don't fit either of these two patterns, are given in (c). Note that

the African American English version of *funeral*, where /j/ changes to /ɪ/, shows the reverse of what happens in *February* and *defibrillator* (see (11)).

The idea that this assimilation is related to dissimilation has been raised by Thomas (1935:110), who suggests that [fə'rɪmljər] 'may be an avoidance of what the speaker feels to be a dissimilation. . . although such an explanation sounds too rational.' Under Ohala's theory, however, the hypercorrection is not rational but perceptual. The listener is not inserting an /ɪ/ that he never heard, merely on the logical assumption that an /ɪ/ could have been deleted through dissimilation. Rather, he is mistaking the long-range resonances of one /ɪ/ for the presence of another /ɪ/, just as in other cases he mistakes the presence of one /ɪ/ for the long-range resonances of the second. It is interesting to note that the word *photographer*, which standardly has two /ɪ/s, has been reported with both dissimilation (fə'tagəfər) and assimilation (fə'r'tagrəfər). This word bears out the prediction that hyper-correction and hypo-correction are both possible responses to long-distance rhotic cues.

3.4 Misperception plus selection: extending Ohala's theory

One major and valid criticism that Alderete & Frisch (2006) bring against hypercorrective theory is that it fails to explain why listeners predominantly favor hypocorrection in some cases but hypercorrection in others. According to Ohala, assimilation and dissimilation are simply perceptual errors in opposite directions. Yet it is clear that some sound sequences, cross-linguistically, are far more likely to undergo assimilation than dissimilation (for example, a nasal followed by another consonant), while other sequences are far more likely to undergo dissimilation than assimilation (such as two liquids in the same word). This asymmetry is seen with liquids in American English as well. Although dissimilatory deletion of /ɪ/ (Tables 1–3) and assimilatory insertion of /ɪ/ (Table 5) are both possible, dissimilation is more common.

I suggest that the explanation for this asymmetry is not a matter of acoustics or perception. Rather, the asymmetry reflects an active choice by speakers, and that choice is influenced by the phonological grammar. I will present a modified version of Ohala's theory of language change, which introduces one important new mechanism: the idea that listeners choose from among their own variant perceptions of a word.

The diagram in Table 6 shows how this could happen. It expands the Ohala-style scenario to show a situation in which a listener hears the same word, *photographer*, from four speakers. These speakers all have the same target pronunciation, [fə'tagrəfər]. However, they have varying degrees of long-range /ɪ/-resonances, which cause their pronunciations to sound different. Speakers 1 and 2 have relatively weak /ɪ/-resonances, so that the schwa in the initial syllable is little affected, and sounds like a plain schwa. Speakers 3 and 4 have strong /ɪ/-resonances, which cause the schwa of the initial syllable to sound rhoticized. The listener detects these differences, and must attempt to correct for the /ɪ/-resonances. For speaker 1, the listener rightly decides that no correction is necessary, and reconstructs the

word with two /r/s. For speaker 2, the listener mistakenly hypercorrects: he thinks that the speaker has strong /r/-resonances, and that the /r/ of the third syllable is an anticipatory resonance of the /r/ of the fourth syllable, and hence he incorrectly reconstructs the word with only one /r/. For speaker 3, the listener accurately corrects for the extended /r/-resonance and realizes that the first schwa is not supposed to be rhoticized. He reconstructs the word with two /r/s. For speaker 4, the listener mistakenly hypocorrects. He fails to realize that the initial schwa is only rhoticized through anticipatory resonance effects, and reconstructs the initial syllable as containing an /r/.

Target pronunciation for all 4 speakers: [fə'tagrəfər]

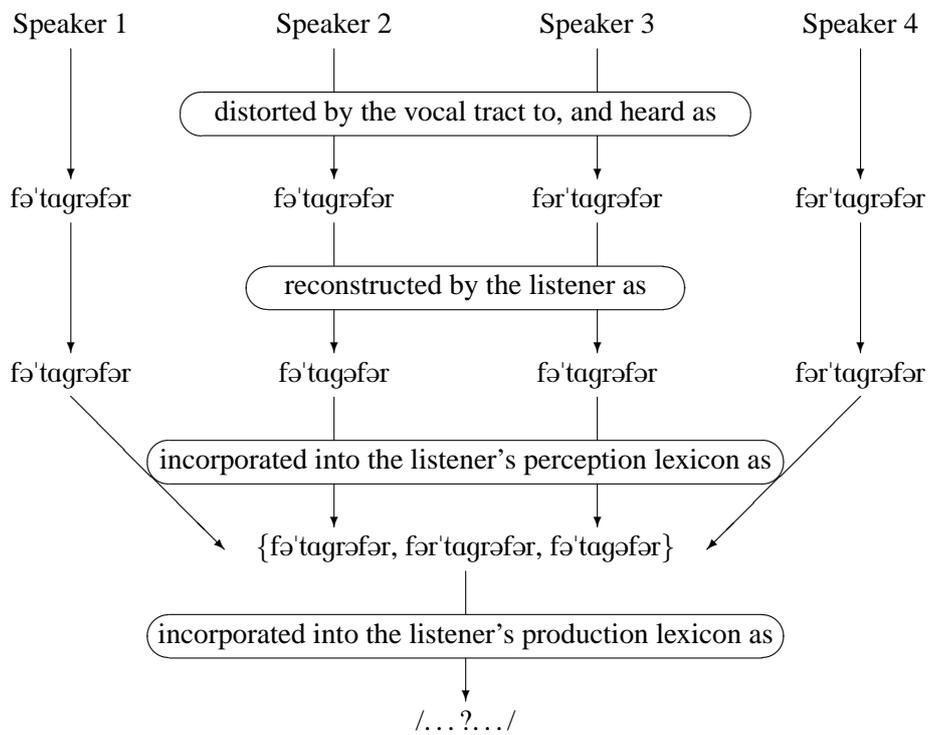


Table 6: Four production and perception scenarios for *photographer*

Hence, the listener believes he has heard three pronunciations of *photographer*. He believes that two speakers said [fə'tagrəfər], one said [fə'tagəfər], and one said [fər'tagrəfər]. He does not know that these varying percepts are only due to phonetic variation among the speakers's productions and variation in his own perception system; as far as the listener can tell, there may be multiple underlying forms of the word in the community (as there are with many words, like *tomato*).

When it comes time to speak, the listener-turned-speaker has several possible models for his own pronunciation. At this point the scenario becomes one that is familiar to sociolinguists, who emphasize that most speakers encounter extensive linguistic variation and must actively choose which pronunciations to adopt. Their choice can be influenced by statistical factors, with speakers preferring the pronunciation that is most common. In this case, the most common percept is the correct one, [fə'tɑgrəfər], so a speaker trying to imitate the majority would not dissimilate or assimilate. The choice can also be affected by social factors. Learners tend to choose the pronunciations that are associated with speakers they want to identify with, so if the listener wished to be associated with speaker 2 or speaker 4, this could lead him to choose the dissimilated or assimilated pronunciations.¹²

But I suggest that the learner also is influenced by purely phonological factors: he evaluates variant pronunciations using his phonological grammar, and all else being equal, he prefers the pronunciation that is judged by that grammar to be least marked. The tableau in (13) shows how two well-motivated phonological constraints, NO CODA and NO COMPLEX ONSET, evaluate the competing pronunciations of *photographer*. According to these constraints, [fə'tɑgəfər] is better than [fə'tɑgrəfər], which is better than [fər'tɑgrəfər].

	NO CODA	NO COMPLEX ONSET
(13) fə'tɑgəfər	*	
fə'tɑgrəfər	*	*
fər'tɑgrəfər	**	*

Therefore, if the listener chooses to deviate from the pronunciation [fə'tɑgrəfər], which is statistically the most common perception in the scenario shown in Table 6, the phonology would prefer that he shift his pronunciation to the less marked [fə'tɑgəfər] rather than to the more marked [fər'tɑgrəfər]. In this way, dissimilation is phonologically preferred over assimilation. Assimilation is still a possibility, since it could be that the assimilated pronunciation is preferred for a social, non-phonological reason.¹³

To clarify, this theory does not predict that dissimilation is preferred over assimilation in all circumstances. It depends on the particular sound sequences involved, and which constraints they violate. Suppose a speaker hears /np/ variably as [np] and [mp] (the latter due to hypo-correction), and hears /mp/ variably as [mp] and [np] (the latter due to hyper-correction). The constraints shown in (13) have no preference between [mp] and [np], so they are irrelevant here. Instead, constraints

¹²Goodman & Halvey (2006) discuss, for example, how social factors such as a desire to sound 'local' affect the decision of students and staff at Swa(r)thmore College to adopt the dissimilated or non-dissimilated pronunciations of the college's and town's name.

¹³Also, as noted in the discussion under (11), top-down factors may affect perception in some cases. These top-down influences from the lexicon may happen to make hypo-correction the more common perceptual error for certain words. For example, I suspect that assimilation is common in *sherbert* because it makes the word similar to *Herbert*, and because there are no other common English words ending in [-ərβət].

on place-sharing in consonant clusters will make the decision. Since it is easier to articulate a cluster with a single place of articulation, [mp] is phonologically better than [np]. So, we predict that the phonology would favor an assimilatory change of /np/ to [mp], but would disfavor a dissimilatory change of /mp/ to [np]. And indeed, assimilation is very common in nasal-stop sequences cross-linguistically, while dissimilation in these sequences is rare or non-existent.

This way of looking at the process of dissimilation is an extension of Ohala's model. Whereas Ohala's model treats diachronic assimilation and dissimilation as mechanical processes, proceeding automatically from the problems of processing coarticulation, the 'misperception plus selection' model claims that hyper-correction or hypo-correction create only the potential for change in lexical representations, not the change itself. Perceptual mistakes on some tokens are what initially gives the learner the impression that there is more than one representation of a word available. The learner's choice of representation, however, can be influenced by factors unrelated to perception, including phonological constraints. Thus, this model sees language change as being triggered and limited by phonetic factors, but also partly goal-oriented.

3.5 The issue of structure preservation

American /r/-dissimilation bears on the question of whether and why dissimilation is structure-preserving. It has been claimed that dissimilation, unlike many phonological processes, does not introduce new sounds or sound sequences into a language. Ohala (1993:255-6) claims that, in all languages, 'the end product of dissimilation seems to be a segment drawn from the same set that the language had before the sound change', and Kiparsky (1995:658) agrees that the result of dissimilation 'should be a well-formed structure of the language, hence in particular one representable in terms of its authentic phonological inventory'. For example, a language should not dissimilate /r/ to [l] if does not already have an r/l contrast. In this way, dissimilation differs from processes like assimilation, which often do introduce new segments or sequences of segments into a language (as when English developed /ŋ/, which is now a contrastive segment, through assimilation of /n/ to following velars).

As far as I am aware, the /r/-dissimilation pattern described here is the first proposed counterexample to Ohala and Kiparsky's claims. Swadesh (1947:142) claims that dissimilatory deletion of /r/ after stressed /o/ regularly leaves behind a vowel that has no more than a marginal presence in such contexts otherwise:

Short o, mid-back rounded, is found in Scottish words like *pot* and *rod*; in New England, it is typical in words like *home*, *whole*, *coat*, *road*. Occurrences in General American tend to be sporadic. The most widespread case is the colloquial *gónə* (*gonna*), whose vowel is not like that of *gunner* (ə) or *bonus* (ou). Joos (Wisconsin) gives *hól* (*whole*). For me, *hól* is limited to phrases like *the whole thing*,

where it is different from the otherwise occurring *houl*. In addition I have *o*, varying to a certain extent with *ɔ*, in the position before *r* (*story, for*); the variation is paralleled by one between *e* and *ɛ* in the same position. Colloquial variants with *r* lost by dissimilation provide additional illustrations of *o* before a consonant other than *r*: *kónər*, *kwódər*, *kòpərəíʃn* beside *kórnrər*, *kwórtər* or *kwórtər*, *kòrpərəíʃn* (*corner, quarter, corporation*).

Similarly, Canepari (2005:89) claims that when /r/ is dropped from /or/ ‘words do not become ambiguous, because the vowel timbre alone is distinctive’. He describes the vowel that is left as back rounded lower-mid, higher than [ɔ] but lower than [o], and his illustrations of vowel quality do not show this vowel occurring in American English except as a result of dissimilation. Aside from the slight difference in transcriptions (which is probably just a matter of transcription systems), Canepari’s and Swadesh’s descriptions are consistent with one another.

Swadesh and Canepari’s descriptions mean that dissimilation creates a new kind of vowel contrast. Before most consonants, General American has a contrast between *ou/ɔ* (*odor* [ˈoʊrər], *audit* [ˈɔrt]), but no contrast between *ou/ɔ/o*. The phone [o] occurs only as an allophone of /ou/ or /ɔ/ before /r/, as in *order* [ˈorrər]. However, when /r/ is deleted through dissimilation, this allophone remains, creating words like *order* [ˈorər]. This in effect creates a *ou/ɔ/o* contrast which does not exist except when the [o] derives from dissimilation. In this way, dissimilation is not structure preserving.

Canepari also claims that dissimilation creates a second kind of distinctive stressed vowel: in dissimilated *mu(r)derer* and *further*, he transcribes a half-long [ə], [mədərər]. He does not show this vowel as occurring in stressed syllables except as a result of dissimilation, so again, we effectively have a new vowel contrast that only arises as a result of dissimilation.

There is disagreement over whether the hypercorrective theory predicts that dissimilation must be structure preserving. Ohala argues that it does. He reasons that a listener should assume speakers only produce phonologically possible words, and hence the listener would not hypercorrect the speech signal in a way that recovers an impossible word. However, Blevins & Garrett (1998:520) disagree, pointing out that dissimilation might happen at a stage of learning when the listener is not fully aware of what constitutes a possible word:

In connection with dissimilation, Ohala (1993) states that sound change caused by ‘hypercorrection’ does not create new segments. He attributes this to ‘dissimilation being the result of the listener applying normalization processes to the speech signal: normalization requires recovering a (presumed) standard sound from a signal that differs in some way from the standard’. Again, it is unclear to us how language learners know which sounds are standard, or what model of change restricts innovations to those who already have a standard. An al-

ternative explanation for the fact that most dissimilation is structure-preserving may be that dissimilating consonant features are typically laryngeal features or secondary features such as palatalization, labialization, and pharyngealization. Segment inventories with such consonant types generally also include their plain (e.g., unaspirated or nonpalatalized) counterparts.

In Blevins and Garrett’s view, the failure of American /r/-dissimilation to respect structure preservation is not surprising, as long as dissimilation occurs in children who do not fully understand the system of vowel contrast. We may speculate that the very complexity of the American vowel system makes such mistakes more likely. American has a large inventory of vowel segments and an even larger inventory of vowel phones, because of the many contextual allophones. Learning the rules of these phones’ distribution could well be complicated and not completed until late. A listener who believes he hears [orər] is not reconstructing a phone [o] that doesn’t exist in the standard language; he is merely reconstructing that phone in a context where it doesn’t standardly occur. It is plausible that some learners don’t realize that. Hence, I do not consider these facts to be a problem for the hypercorrective theory.

It should be mentioned that American /r/-dissimilation does sporadically show effects of structure-preservation. For example, *turmeric*, which is standardly [ˈtɜrməɾɪk], is often pronounced [ˈtʊməɾɪk]. It seems evident that listeners could not have changed [ˈtɜrməɾɪk] to [ˈtʊməɾɪk] purely through perceptual hypercorrection, because there is no reason to hear a [u]. Spelling must play a role. Perhaps speakers choose to pronounce the orthographic *u* precisely in order to avoid the non-structure-preserving option of a stressed schwa, which Canepari describes occurring in dissimilated *mu(r)derer* and *fu(r)ther*. Several other words given in (14) show similar vowel changes associated with dissimilation. In *periph(e)ral*, *barbitu(r)ate*, and *co(rr)oborate*, deletion of /r/ from the full form would result in an illegal əV sequence, so speakers change the schwa to a full vowel, again apparently using the orthography as a guide.¹⁴

(14) Vowel changes associated with dissimilation

ər → V	<i>turmeric</i>	ˈtɜrməɾɪk	ˈtʊməɾɪk	G2006, B. Vaux
	<i>barbiturate</i>	ˌbɑrˈbɪtʃəɾət	ˌbɑrˈbɪtʃuət	G2006, B. Vaux
	<i>corroborate</i>	kəɾˈɑbərəɪt	kɑˈɑbərəɪt	G2006
	<i>peripheral</i>	pəɾˈɪfərəl	pəˈɪfɪəl	G2006, B. Vaux

¹⁴A different kind of dissimilation involving vowel changes is seen in dialectal pronunciations of *rollercoaster* as [ˈrɒliˌkɔstər] (Donahue 2006:110), and *kindergarten* as [ˈkɪn(d)ɪˌɡɑrtən]. These vowel changes are unrelated to structure preservation; they probably result from a two-step diachronic path, in which dissimilatory loss of /r/ was followed by [ə] changing to [ɪ]. There are other words where /ə/ changes to /ɪ/ in similar position within the word, independent of dissimilation, like [ˈsæn(t)ɪˌklɑz] for *Santa Claus*. Donahue (2006:110) notes a similar case in two Pennsylvania dialects, where *peanut butter* can be pronounced [ˈpɪnəˌbʌtər] or [ˈpɪniˌbʌtər].

These words show that dissimilation must sometimes happen through a more complicated process than perceptual hypercorrection alone; at some point, speakers' knowledge of spelling is affecting the process. The number of such cases is very small, however.

In addition, I have come across examples of dissimilation applying to /or/ without creating the special [o] vowel that Swadesh and Canepari describe. For example, *quarter* is often heard as [kwɔrɔr] rather than Swadesh's [kwodɔr] (Myhill 1988), and I have heard *extraordinarily* pronounced as [ɛkstrɑdɪ'nɛrəli] by a New Yorker. It is unclear to me how extensive this phenomenon is, and it would be useful to have further information on it. Perhaps, although structure-preservation does not characterize the initial creation of dissimilated words, the exceptional phonological contrasts tend to disappear as the new pronunciations spread to speakers who are not active dissimulators. In other words, perhaps structure preservation is violated in the short run but holds in the longer run. This idea is purely speculative, but the question illustrates why it would be useful to have more study of active dissimilation processes like this one.

4 Local /r/-dissimilation: Avoidance of rVr

In this section I describe and analyze a different kind of /r/-dissimilation that occurs in English: avoidance of the structure rVr (where V is a vowel), and especially [rɔr]. Although such sequences are permitted in the standard language, they are eliminated or avoided through a host of minor processes in various colloquial dialects.

I argue that these processes cannot all be explained as a result of misperception. Rather, at least one and likely more of them must be the result of a deliberate avoidance of [rɔr] and [rVr]. This suggests that there are phonological constraints against these structures:

- (15) *[rɔr]: Two [r]s are not separated by only a schwa.
 *[rVr]: Two [r]s are not separated by only a vowel.

In other words, I argue that /r/-dissimilation over a long domain and /r/-dissimilation over a short domain are distinct processes and happen for different reasons. The former is accidental, the second is grammar-driven.

Several of these minor processes could also conceivably be used to accomplish long-distance /r/-dissimilation, but they are not. I argue that this failure to remove /r/s that are separated by more than a vowel means that English provides no support for the existence of a constraint penalizing multiple /r/s within a larger domain.

Haplology One way to avoid /r/s in close proximity is through haplology, the deletion of one of two similar syllables that are adjacent to one another. There are a number of words in which sequences of VrVr or VrVVr are simplified to Vr, as shown in (16), so that both a vowel and /r/ are deleted.

(16) Haplology in VrVr		
a.	<i>(con)temporary (Brit.)</i>	kən'tempər(ə)rɪ R1906
	<i>supernumerary (Brit.)</i>	ˌsju:pə'nju'mər(ə)rɪ R1906
	<i>literary (Brit.)</i>	'lɪtər(ə)rɪ R1906
	<i>arbitrary (Brit.)</i>	'ɑbətɪ R1906
b.	<i>itinerary</i>	ˌaɪ'tɪnər(ɪ)i G2006
	<i>hierarchy</i>	'haɪər(,ɑr)ki G2006
c.	<i>error</i>	'ɛr(ə)r E1999
	<i>juror</i>	'dʒər(ə)r G2006
	<i>mirror</i>	'mɪr(ə)r E1999, G2006
	<i>terrorist</i>	'tɛr(ə)rɪst G2006
	<i>sufferers</i>	'sʌfər(ə)rz G2006
d.	<i>there are (similarly where are)</i>	ðɛr ~ ðɛr ~ ðər ~ ðr H1893
	<i>'far are</i>	fər ~ far H1893
	<i>'for her</i>	fər ~ fɔr ~ fər H1893
e.	<i>deteriorate</i>	də'tɪrɪ(ə)rɪt G2006, J. Wirth
	<i>interior</i>	ɪn'tɪr(i)ər G2006

In the examples in (16a), a sequence of /ərər/ simplifies to [ər]. Although these examples have been reported mostly for British English, I believe haplology can apply to the same words in American English. The words in (b) are similar examples from American, but involve a sequence of ərVr. The words in (16c) show a phenomenon of some American dialects in which /rər/ changes to [r].¹⁵ Hempl (1893) reports a similar process affecting /ər/ in function words, as shown in (d). Finally, the examples in (e) involve the sequences [rɪər], and in one case, *interior*, two vowels delete.

Deletion of syllables is not triggered by /r/ earlier in the word. For example, speakers who delete the final syllable of /'mɪrər/ do not delete the final syllable of /'rɪvər/. Thus, this process is not used to accomplish long-distance dissimilation.

Changing schwa to a full vowel Some American speakers remove final [-rər] by another means: they put secondary stress on the (standardly unstressed) final syllable, and change the schwa to a full vowel. The prescriptivist Elster (1999:220) reports pronunciations like the following:

(17)	/rər/ → [rɔr]
	Standard 'Overpronounced'
	<i>error</i> 'ɛrər 'ɛrɔr
	<i>juror</i> 'dʒərər 'dʒərɔr

This kind of pronunciation seems to be associated mostly with educated, professional speakers. Elster quotes Landau (1984:58) as attributing the 'hyper-articulate'

¹⁵A non-scientific 2006 Washington Post online poll asked how many syllables *mirror* has. About 7.5% of 3530 respondents answered that it is monosyllabic.

pronunciation of *juror* particularly to judges and lawyers in New York City. I suggest that stressing final /-rər/ is a strategy for avoiding the loss of final /-ər/ that we saw in the same words in (16c). Dropping the final syllable of *err(or)*, *mirr(or)*, etc. is stigmatized. A speaker who wants to avoid [rər], yet sound educated, decides to give full value to the orthographic vowel.¹⁶

Analytic comparatives In one situation, it is possible to avoid [rər] through a morphological choice, namely by not using the comparative suffix *-er* with adjectives that end in /-r/. Adjectival comparatives can be formed either through suffixation or with the word *more*. In general, monosyllabic words tend to take the *-er* suffix, but Jespersen (1949:349) claims that words like *barer*, *clearer*, *dearer*, *purser*, *rarer*, and *surser* are dispreferred, even though the superlative suffix *-est* is common with all of these. He concludes that ‘there is a marked tendency to avoid *-er*’. Rohr (1929) (quoted in Mondorf 1993:280) also observes that words like *bitter* and *proper* rarely took the *-er* suffix in 17th and 18th century prose. Mondorf (1993) corroborates these claims through a corpus study of comparatives in modern writing, which identifies final /-r/ as one of the factors decreasing the statistical likelihood that an adjective will take the comparative suffix. The constraint *[rər] can explain this choice on the part of speakers.

There does not seem to be any avoidance of putting the *-er* suffix on adjectives containing a non-final /r/. Adjectives like *prouder* and *brighter* feel perfectly acceptable. It appears that comparative formation is limited only by avoidance of [rər], and is not used to achieve long-distance dissimilation.

Blocking of linking and intrusive [r] Sometimes phonological rules are blocked specifically when they would create [rər] or [rVr]. One case of this is the suspension of linking or intrusive [r] after /rV/. Speakers of certain non-rhotic dialects, who delete /r/ when it is not prevocalic, may retain a historical final /r/ as a ‘linking’ [r] before a vowel-initial word, as in (18a). They may also insert an ‘intrusive’ [r] between two vowels, even if there was no /r/ historically present, as in (b). But for some speakers of Southern British English, linking and intrusive [r] are blocked when they would create an rVr sequence, as in (c) and (d) (Jones 1963:112-3, Wells 1982b:224; Wyn Johnson p.c.).

(18) Blocking of linking and intrusive [r]

Linking [r]:		Intrusive r:	
a.	<i>a river of it</i> ə rɪvər əv ɪt	b.	<i>Rita is</i> rɪtər ɪz
	<i>pour a glass</i> pɔːr ə glɑːs		<i>law and order</i> lɔːr ənd ɔːdə
c.	<i>an error in it</i> ən ɛrə ɪn ɪt	d.	<i>Farrah is</i> færə ɪz
	<i>a roar of laughter</i> ə rɔː əv lɑːftə		<i>raw apples</i> rɔː æpəlz

¹⁶For evidence of the stigmatization of haplology, note Elster (1999:257)’s admonition: ‘Mirror has two syllables. Avoid the pronunciation of the slovenly speaker who says MEER, like the word mere, and the illiterate speaker who says MUR’. By contrast, speakers who say [ˈdʒərər] for *juror* are only accused by Elster of ‘trying too hard’ [p.220].

The acceptability of linking [r] in *river*, and intrusive [r] in *Rita*, shows that linking and intrusive [r] are not blocked by an /r/ earlier in the word. Hence, long-distance dissimilation is not accomplished through blocking this rule, although in principle it could be.

Blocking of r-insertion A similar case of rule-blocking occurs in some Southern dialects, such as Appalachia and the Ozarks. In these dialects, final /ə/ (which often corresponds to final /o/ in other dialects) can become [ər] (Schilling-Estes & Wolfram 1997:67, Sherwood 1837). Some typical examples are given in (19a). For at least some speakers, this insertion does not occur in words that end /-rə/, like those in (19b). Evidently, the rule is blocked where it would create [rər].¹⁷

- (19) /-ə/ → [-ər]
- | | | | | | |
|----|-----------------------------|---------|----|------------------|-------------|
| a. | (<i>mo</i>) <i>squito</i> | 'skɪrər | b. | <i>arrow</i> | 'ærə |
| | <i>window</i> | 'wɪndər | | <i>tomorrow</i> | tə'mɑrə |
| | <i>yellow</i> | 'jɛlə | | <i>borrow</i> | 'bɑrə |
| | <i>fellow</i> | 'fɛlə | | <i>sparrow</i> | 'spærə |
| | (<i>po</i>) <i>tato</i> | 'teɪrər | c. | <i>tornado</i> | 'tɔr'neɪdər |
| | <i>pillow</i> | 'pɪlə | | <i>armadillo</i> | 'ɑrmə'dɪlə |

The /r/-insertion rule is not blocked by an /r/ earlier in the word. It does apply to *armadillo* and *tornado*, shown in (19c). So the rule is blocked only to enforce local dissimilation, not long-distance dissimilation.¹⁸

There is even evidence that speakers try to avoid [rər] when they self-consciously over-correct for this /r/-insertion rule. Sherwood (1837:67)'s list of 'provincialisms' includes two examples where final *-ror* is changed to *-ro*: *erro* for *error*, and *terro* for *terror*. He also claims that people say *pillar* for *pillow* and vice versa. This /r/-dropping is evidently a hypercorrection for the /r/-insertion rule. Speakers must have mistakenly thought that the final *-or* of these words was derived from *-o*, and changed it to what they assumed to be the proper form, inadvertently inverting the rule. What is interesting is that, of the hundreds of English words ending in [-ər], only *error*, *terror* and *pillar* are mentioned as undergoing this hyper-correction. The confusion of *pillar* may be due to the existence of the word *pillow* and its own regular variant ['pɪlə], but I suggest that the hypercorrection of *error* and *terror* was influenced by the desire to get rid of the final [-rər] sequence. If a speaker was hesitating as to whether *error* or *erro* was correct, the phonological badness of *error* pushed him towards accepting *erro*, so that this became a common enough mistake to merit mention.

¹⁷Thanks to Jim Hall, originally of Marshall, Arkansas, for judgments on these forms.

¹⁸Another possible case of local dissimilation blocking a sound change concerns the 'intrusive [r]' that many Americans insert in words like *wash*, *squash*, *gosh*, (Gick 1999:33) and *mosh* (Eggcorn Database). This insertion does not seem to occur in *frosh* (slang for freshman), where it would create an rVr sequence. But given the limited scope of this rule, it is hard to draw firm conclusions.

Morphological substitution Dixon (1982:235) points out that the words *where're*, *there're* and *here're*, all of which contain [rɚr], are optionally avoided through syntactic means.

As shown in (20), a plural noun like *lions* must generally appear with a plural copula: *are*, not *is*. Yet if the copula is phonologically reduced, then *where's the lions* is at least as well-formed as *where're the lions*. The words *there's* and *here's* are similarly acceptable substitutes for *there're* and *here're*. This substitution of 's for 're only occurs when the reduced copula directly follows the [r]-final word; it is not possible in cases where other words intervene, as in (20d).

- (20)
- | | | |
|----|-------------------------------|------------------------------|
| a. | Where are the lions? | Where're the lions? |
| b. | *Where is the lions? | Where's the lions? |
| c. | Where the hell are the lions? | Where the hell're the lions? |
| d. | *Where the hell is the lions? | *Where the hell's the lions? |

Dixon concludes that the substitution 'is undoubtedly due to a desire to avoid the infelicitous phonological sequence *where're*.' A syntactic requirement of number agreement is being optionally violated in order to satisfy the constraint *[rɚr].¹⁹

Summary The six patterns described here—haplology in VrVr sequences, changing of final /rɚr/ to [ror], avoidance of [-rɚr] comparatives, blocking of linking and intrusive [r] after /rV/, blocking of /r/-insertion after /rə/, and avoidance of words like *where're*—show that [rVr] and particularly [rɚr] have a marked status in various English dialects, and are avoided by a variety of means.

Some, but not all, of these cases of /r/-loss might be a result of misperception. This is likely the explanation for haplology in words like *mirror*, for example. Many speakers who still have a two syllable form of *mirror* produce this word in a way that sounds roughly like [mir:]. There is no distinct break between the medial and final [r]s. It is easy to imagine that listeners could have trouble interpreting the long [r:] sound, and might reinterpret it as a single /r/ rather than /rɚr/. This kind of change can probably be analyzed in an account of language change like Ohala's, which attributes changes to perceptual mistakes.

However, misperception cannot explain the avoidance of [rɚr] in other cases. It is obviously implausible that anyone could mishear *clearer* as *more clear*, or *where're* as *where's*, so here we must assume that speakers are avoiding [rɚr] by choice. I will conclude that there is indeed a grammatical constraint prohibiting the structure [rɚr], and that any of the processes discussed in this section may be synchronically encoded in the grammar using the constraint *[rɚr]. This constraint could also be used to analyze a few of the /r/-dissimilation cases mentioned in section 2.2 (*prerogative* and *infrared*), although the perceptual hypercorrection analysis can also work for these.

By contrast, the English facts seem to offer no support for the existence of a constraint banning multiple /r/s within a larger domain. At least three of the

¹⁹Thanks to Matthew Wolf for alerting me to these facts.

minor processes discussed in this section could in principle be used to achieve long-distance dissimilation, but none of them are. If a constraint like $*[r...r]_{word}$ exists, it must be so low ranked in all of these English dialects that it has no effect. As mentioned before, this does not mean that such a constraint does not exist, cross-linguistically, but only that the English facts provide no support for its existence.

5 Conclusion and further questions

In this paper, I have offered a more extensive description and analysis of American /r/-dissimilation than had previously been available. I have shown that the process, although sporadic, is more predictable than is commonly assumed. I have argued that this dissimilation results from perceptual hypercorrection, as proposed by Ohala (1981). However, I have expanded Ohala's model to admit some role for phonological factors as well. I suggest that hypercorrection only makes dissimilated forms available; the choice to use and preserve them reflects the fact that they are phonologically simpler and better.

There are a number of remaining questions about American /r/-dissimilation, and much potential for further study of the process. It would be useful to have a more extensive description of whether and how often dissimilation occurs in particular words in particular dialects. The data used here come from a mixture of American dialects, and it is likely that further interesting generalizations would emerge if the data were better differentiated. Dialect studies could provide this information, but usually don't, because sociolinguistic work that mentions dissimilation typically concentrates on external factors affecting dissimilation in a small number of common words. I hope to have shown here the value of collecting as many examples as possible of dissimilation, including in rare words, in order to understand the internal factors that make dissimilation likely.

The analysis of dissimilation offered here also lends itself to empirical phonetic testing. I have offered conjectural phonetic explanations for why dissimilation is primarily anticipatory, takes place between labials and coronals, takes place in codas, etc. It should be possible to determine in the laboratory whether the acoustic properties of these words, and the perceptual processes applied to them, indeed produce the correct results.

A better understanding of American /r/-dissimilation has the potential to clarify more general questions about the nature of dissimilation cross-linguistically. A great deal of the debate about dissimilation has been based on ancient, completed diachronic processes, or on limited morphological alternations. In both cases, we can only speculate about the phonetic conditions that originally gave rise to dissimilation; there is no possibility of testing the production or perceptual patterns of, for example, ancient Latin speakers. It would be valuable to have more study of dissimilation processes that are active and not morphologically limited. American /r/-dissimilation has the added advantage that it takes place in a dialect whose speakers are widely accessible. I hope that this preliminary study will stimulate

further interest in the phenomenon.

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