

# Japanese /r/ is not feature-less: A rejoinder to Labrune (2014)

## Abstract

Labrune (2014) argues that Japanese /r/ is structurally empty. This reply argues that the phonological characteristics of /r/ which are discussed by Labrune (2014) come with many systematic exceptions, and hence they are better handled in terms of violable constraints. Alternative analyses based on Optimality Theory (Prince & Smolensky, 1993/2004) are presented. This reply also points out that two of the three constraints on /r/ that are discussed by Labrune (2014) are not in fact specific to /r/, and therefore, motivating structural emptiness based on these patterns would face a problem. Based on these considerations, this reply concludes that /r/ (and other segments) should have segmental contents.

## 1 Introduction

Labrune (2014) argues that Japanese /r/ is “phonologically empty” (p. 1). Building on previous studies making use of the underspecification theory (e.g. Mester & Ito 1989), Labrune (2014) goes so far as to say that /r/ is “totally featureless at the abstract level” (p.14). This reply article reviews some of the evidence that is discussed in Labrune (2014), and shows that the behavior of /r/ actually shows that it has features.<sup>1</sup> In particular, this paper argues that the phonological characteristics of /r/ which are discussed by Labrune (2014) come with many systematic exceptions, and hence should instead be handled in terms of violable constraints. To provide explicit accounts of the behaviors of /r/ using violable constraints,

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<sup>1</sup>Although some pieces of evidence in Labrune (2014) come from patterns of Old Japanese and historical developments of /r/, Labrune (2014) makes it explicit that the same argument holds for Modern Japanese—that Japanese /r/ is synchronically structurally empty (p.2). The current reply is exclusively about Modern Japanese, and has nothing to say about the diachronic natures of /r/.

Labrune (2014) also argues that /r/ is unmarked (pp.13-14). This reply remains neutral about this claim—/r/ may or may not be unmarked in Japanese phonology. This reply instead focuses on the claim that /r/ is structurally empty.

alternative analyses in terms of Optimality Theory (Prince & Smolensky, 1993/2004) are presented.

While the specific aim of this reply is to reexamine the arguments presented in Labrune (2014), this reply can also be understood in the broader context of the debate about whether segmental markedness should be understood in terms of underspecification or (violable) constraints. Labrune (2014) argues that /r/ is an unmarked segment in Japanese, and attempts to explain its behavior in terms of the underspecification theory (Archangeli, 1988). This reply instead uses violable constraints to explain the behaviors of /r/. (As stated in footnote 1, this reply remains neutral about the markedness of /r/, and focuses on the claim that it is structurally empty.) For other arguments against the underspecification theory of segmental markedness, of which Labrune (2014) is an example, see Gafos & Lombardi (1999), Kurisu (2000), McCarthy & Taub (1992), McCarthy (1994), McCarthy (2002), Prince & Smolensky (1993/2004), Steriade (1995) among others.

## 2 Resistance to gemination

First, Labrune (2014) points out, citing Mester & Ito (1989), that Japanese does not allow geminates of /r/, and uses this observation to suggest that Japanese /r/ is structurally empty (pp.8-9). However, it is not only /r/, but approximants in general, which cannot be geminated in the phonology of Japanese, as exemplified below in (1) (Kawagoe, to appear; Kawahara, to appear; Kawahara et al., 2011).

- (1) Geminates in Japanese
  - a. /katta/ ‘bought’ vs. /kata/ ‘frame’
  - b. /isso/ ‘if so’ vs. /iso/ ‘beach’
  - c. /konna/ ‘such’ vs. /kona/ ‘power’
  - d. \*/korra/
  - e. \*/kowwa/
  - f. \*/kojja/

Labrune’s (2014) account of the resistance against gemination in terms of structural emptiness would not be able to distinguish between /r/, /w/ and /j/ in Japanese—one would have to assume that all of these segments are structurally empty, which is not desirable, because we would not be able to distinguish these segments. The prohibitions against these types of geminates are, therefore, better accounted for in terms of constraints against /rr/

and glide geminates: \*/rr/, \*/ww/, and \*/jj/.<sup>2</sup>

Moreover, gemination of /r/ is possible in emphatic gemination patterns (Aizawa, 1985; Kawahara, 2013; Nasu, 1999); /karrui/ ‘very light’ from /karui/ ‘light’ and /zurruui/ ‘very cunning’ from /zurui/ ‘cunning’ (see Kawahara 2001 for the non-structure-preserving nature of this gemination). Geminate /rr/ also appears in some loanwords, particularly in those from Arabic and Italian, which themselves have liquid geminates (e.g. /arraa/ ‘Allah’ and /diaberri/ ‘Diabelli’). These geminates of /r/ are indeed marginal in the sense that they are found only in the emphatic conditions and some loanwords; however, the fact that they can appear at all shows that the resistance of /r/ against gemination is better handled by a violable constraint \*/rr/.

For the sake of illustration, I illustrate how this violable constraint would work in Optimality Theory (Prince & Smolensky, 1993/2004), in which constraints are violable.<sup>3</sup> Let  $\text{MAX}(\mu)$  be a faithfulness constraint that prohibits mora-deletion or degemination (see McCarthy & Prince 1995 for the initial formulation of the MAX constraint). Let us posit a specific rendition of this faithfulness constraint for emphatic environments,  $\text{MAX}(\mu)_{\text{emph}}$  (for morphologically-specific constraints, see, e.g., Benua 1997; Ito & Mester 1999, 2003, 2008; Kurisu 2005; Pater 2000, 2010). If the ranking  $\text{MAX}(\mu)_{\text{emph}} \gg */rr/ \gg \text{MAX}(\mu)$  holds, then geminate /rr/ is allowed only in the emphatic forms, as illustrated in the tableaux in (2) and (3):

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<sup>2</sup>This reply assumes that there are distinctive constraints against /r/-geminates and glide geminates for the reason that is stated below; however, nothing hinges on this assumption—it may as well be that a constraint that is active in Japanese phonology is a general constraint, \*APPROXIMANTGEMINATE. One reason to assume distinct constraints for /rr/ and glide geminates is because they may have different phonetic groundings. Gemination and /r/ are inherently mutually incompatible in the sense that /r/ is a short segment in Japanese (Campbell, 1992; Sagisaka & Tohkura, 1984) and gemination requires that the consonant be long (Kawahara, to appear); making /r/ a trill may satisfy both of these conflicting requirements, but a trill comes with its own articulatory difficulty (Solé, 2002). On the other hand, the prohibitions against glide geminates may be attributed to their confusability with corresponding singletons (Kawahara et al., 2011; Podesva, 2000, 2002).

This paper throughout touches on phonetic grounding of the constraints deployed in the analyses, but whether or not the constraints are phonetically motivated does not affect the argument of this paper. Explicit discussion of phonetic grounding of phonological constraints, I believe, makes the constraints more plausible (see e.g. Hayes & Steriade 2004; Kager 1999; Myers 1997). However, I fully acknowledge that not everyone accepts this view (see e.g. Hale & Reiss 2000). I reiterate that the arguments of this paper would hold even if none of the constraints are phonetically-motivated.

<sup>3</sup>It would be possible to model the Japanese patterns in other models of grammar which deploy violable constraints, such as Harmonic Grammar (Pater, 2009, to appear) or MaxEnt Grammar (Goldwater & Johnson, 2003; Hayes & Wilson, 2008). This reply uses Optimality Theory because it is probably best-known—Labrune (2014) presents an Optimality-Theoretic analysis to derive the quality of /r/ from its structural emptiness as well (pp. 16-21). The crucial point here is the *violability* of constraints.

- (2)  $*/rr/ \gg \text{MAX}(\mu)$ : no geminate  $/rr/$

$/arra/$	$\text{MAX}(\mu)_{emph}$	$*/rr/$	$\text{MAX}(\mu)$
$\rightarrow /ara/$			*
$/arra/$		*!	

- (3)  $\text{MAX}(\mu)_{emph} \gg */rr/$ : geminate  $/rr/$  allowed in emphatic forms

$/karui + \mu_{emph}/$	$\text{MAX}(\mu)_{emph}$	$*/rr/$	$\text{MAX}(\mu)$
$/karui/$	*!		*
$\rightarrow /karrui/$		*	

The structure-based theory of the lack of  $/rr/$  is not able to handle these exceptional appearance of  $/rr/$ .<sup>4</sup>

As Labrune (2014) discusses (p.9) (see also Kuroda 1965, Mester & Ito 1989 and Kawahara 2006), glides and  $/r/$  pattern differently in the context of  $/ri/$ -suffixation. The suffix  $/-ri/$  causes gemination of root-final consonants (e.g.  $/patta-ri/$  ‘stopped’); when the root final consonants are glides, a nasal is inserted instead (e.g.  $/bonya-ri/$  ‘absent-mindedly’), whereas neither gemination nor nasal insertion occurs when the root-final consonant is  $/r/$  (e.g.  $/koro-ri/$  ‘rolling’). To account for this difference between  $/r/$  and glides, in addition to  $*/rr/$ , there needs to be some constraint that prohibits an  $/nr/$  sequence; for example, it could be a constraint that is grounded on the phonetic difficulty of implementing a ballistic tongue gesture for  $/r/$  after the oral closure of a nasal. Whatever the nature of this constraint is, it is important to note that this constraint too is violable, as Japanese has many lexical items with  $/nr/$  sequences (e.g.  $/konran/$  ‘confusion’ and  $/konrado/$  ‘Conrad’). Attempting to derive the prohibition against  $/nr/$  from the structural emptiness of  $/r/$  cannot explain these exceptions.

In relation to this argument based on lack of geminate  $/rr/$ , Labrune (2014) argues that  $/r/$  fails to trigger assimilation, and this is because “there is simply nothing in its phonological structure to assimilate” (p. 9). However, since assimilating to  $/r/$  would result in  $/rr/$ , which is independently prohibited, this lack of assimilation triggered by  $/r/$  cannot be considered as an additional argument for the structural emptiness of  $/r/$ . Moreover, all the examples of assimilation provided on page 9 of Labrune (2014), which supposedly show the lack of assimilation to  $/r/$ , have  $/r/$  as the first consonant and another consonant as the second consonant (e.g.  $/wakaranai/ \rightarrow /wakarnai/ \rightarrow /wakannai/$  ‘not know’). However, it is independently known that assimilation in  $VC_1C_2V$  clusters always results in  $VC_2C_2V$ , never in  $VC_1C_1V$  (see Jun 1995, 2003, 2004; Ohala 1990 and also McCarthy 2008; Wilson

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<sup>4</sup>Not being able to easily accommodate exceptions is a general problem for structural explanations of phonological patterns (McCarthy, 2002; Padgett, 1995, 2002; Pater, 2000).

2001 for a similar observation in consonant cluster simplification). Therefore, the argument based on the lack of assimilation to /r/ is doubly-confounded.

### 3 Resistance to palatalization

Another argument that is put forth for the emptiness of structural content for /r/ is the fact that /r/ does not undergo palatalization process in mimetic forms. In Japanese mimetics, palatalization expresses “uncontrolledness”, and where this palatalization occurs is arguably determined by phonological considerations (Hamano, 1986; Mester & Ito, 1989). While whether the loci of palatalization can really be determined phonologically is much debated (Alderete & Kochetov, 2009; Schourup & Tamori, 1992), one point that is clear is that /r/ does indeed resist palatalization (Alderete & Kochetov, 2009). However, this avoidance of palatalization does not support the structural emptiness of /r/. As Kurisu (2009) notes, a constraint against palatalized /r/ is cross-linguistically motivated (Hall, 2000; Rose, 1997), and has an articulatory basis as well—the tongue tip gesture required for /r/ may be articulatorily incompatible with the tongue dorsum raising required for palatalization (Recasens, 1990; Recasens & Espinosa, 2006).

An argument for the account of the lack of palatalized /r/ in terms of violable constraints comes from the fact that palatalized /r/ does indeed appear in many lexical items. Some minimal pairs are shown in (4):

- (4) Minimal pairs in terms of palatalization on /r/
  - a. /rjaku/ ‘abbreviation’ vs. /raku/ ‘easy’
  - b. /rjoku/ ‘green’ vs. /roku/ ‘six’
  - c. /rjoo/ ‘amount’ vs. /roo/ ‘prison’
  - d. /rjo/ ‘travel’ vs. /ro/ ‘road’ (both bound morphemes)

Palatalized /r/ is most often found in Sino-Japanese words (Moreton et al., 1998; Moreton & Amano, 1999), but some non-Sino-Japanese words with palatalized /r/ are also found both in native words (e.g. /**ryaa**/ ‘if (casual)’ and /to**oryanse**/ ‘don’t pass (song lyric)’) and loanwords (e.g. /**ryuumati**/ ‘Rheumatism’, /**ryukku**/ ‘backpack’ and /**ryuuto**/ ‘lute’). These examples yet again show that the resistance to palatalization is better expressed in terms of a violable constraint, which is operative in the formation of palatalized forms in mimetic phonology,<sup>5</sup> but is violated elsewhere, at least in the Sino-Japanese phonology

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<sup>5</sup>This constraint is operative in the mimetic phonology to the extent that the palatalized word formation is phonological (see Schourup & Tamori 1992 for arguments that this palatalization is not really phonological, as it comes with many lexical irregularities). It is at least true, however, that /rj/ is underrepresented in the mimetic phonology (Alderete & Kochetov, 2009).

Again, to illustrate this analysis, an Optimality Theoretic analysis follows (see Kurisu 2009 for a fuller analysis of mimetic palatalization within Optimality Theory). We posit  $*/rj/$ , a constraint against palatalized  $/r/$ , which is cross-linguistically independently motivated (see above). This constraint is operative in determining the locus of palatalization in mimetic forms, as in (5).

- (5)  $*/rj/$  determines the location of  $/j/$  in mimetic forms

$/noronoro+j/$ ‘slow’	$*/rj/$
$\rightarrow /njoro-njoro/$	
$/norjo-norjo/$	$*!$

This markedness constraint, however, is dominated by a faithfulness constraint,  $MAX(pal)$  (McCarthy & Prince, 1995), which protects underlying palatalization, at least in the Sino-Japanese phonology. As a result, forms like  $/rjoku/$  surface faithfully. This constraint ranking is illustrated in (6).

- (6)  $IDENT(pal) \gg */rj/$  protects underlying palatalization on  $/r/$

$/rjoku/$	$MAX(pal)$	$*/rj/$
$\rightarrow /rjoku/$		$*$
$/roku/$	$*!$	

If  $/r/$  were phonologically completely empty on the other hand, then it would not be able to support the palatalization feature in the Sino-Japanese phonology at all.

## 4 Prohibition in word-initial position

As Labrune (2014) points out (pp.3-4), Japanese  $/r/$  cannot appear word-initially, at least in native words (Tateishi, 1990). However, this prohibition against  $/r/$  in word-initial positions does not constitute evidence for its structural emptiness in and of itself. Rather, in order to state the constraint, it is more natural to assume that  $/r/$  has phonological contents, and a constraint prohibits those phonological contents word-initially. Flack (2007, 2009) finds an array of phonological elements that can be prohibited in word/phrase-initial positions in natural languages (e.g.  $[h]$ ,  $[ʔ]$ ,  $[ŋ]$ , rhotics, and glides—see also Smith 2002) and it would be unrealistic to assume that these kinds of elements all lack phonological structures.

Moreover, yet again, prohibition against word-initial  $/r/$  comes with exceptions; this constraint is violated in Sino-Japanese words or foreign words (see (4) above for Sino-Japanese

examples; examples from loanwords include /ruuto/ ‘root’, /remon/ ‘lemon’, /raamen/ ‘ramen’, and many others). A violable constraint offers a way to express the restricted prohibition against word-initial /r/ in Yamato-words.<sup>6</sup> Following, Ito & Mester (1999, 2003, 2008), we can posit stratum-specific faithfulness constraints; for the sake of illustration, let them be  $\text{MAX}_{\text{Foreign}}$  and  $\text{MAX}_{\text{Yamato}}$ . The ranking  $\text{MAX}_{\text{Foreign}} \gg * \text{INITIAL}/r/ \gg \text{MAX}_{\text{Yamato}}$  would get us the right outcome, as shown in the tableaux in (7) and (8):<sup>7</sup>

- (7)  $\text{MAX}_{\text{Foreign}} \gg * \text{INITIAL}/r/$ : Initial /r/ is allowed for foreign items

/raamen/ <i>Foreign</i>	$\text{MAX}_{\text{Foreign}}$	*INITIAL/r/	$\text{MAX}_{\text{Yamato}}$
→ /raamen/		*	
/aamen/	*!		

- (8)  $* \text{INITIAL}/r/ \gg \text{MAX}_{\text{Yamato}}$ : Initial /r/ is not allowed for yamato items

/riki/ <i>Yamato</i>	$\text{MAX}_{\text{Foreign}}$	*INITIAL/r/	$\text{MAX}_{\text{Yamato}}$
/riki/		*!	
→ /iki/			*

Furthermore, like the restrictions on gemination, /r/ is not the only segment that is prohibited in the native phonology of Japanese; voiced obstruents are also prohibited word-initially in Japanese (Kuroda, 2002; Martin, 1987; Tanaka & Yashima, 2013). To the extent that we need to distinguish voiced obstruents and /r/—which we indeed do—the prohibition against /r/ in word-initial position cannot be used for an argument for its structural emptiness—we cannot assume that both /r/ and voiced obstruents are structurally empty.<sup>8</sup>

## 5 Remarks on other arguments

Before closing this reply, some remarks on other arguments presented in Labrune (2014) are in order. First, Labrune (2014) points out that phonetic realizations of /r/ in Japanese vary

<sup>6</sup>A constraint against word-initial /r/ can be grounded on the possible articulatory difficulty of initiating a ballistic gesture for /r/ word-initially. See also Flack (2005) for various restrictions on word-initial liquids in other languages, and discussion of possible phonetic grounding (see also Steriade 2001 and Smith 2002 for related discussion).

<sup>7</sup>This analysis assumes that deletion is the repair strategy to avoid word-initial /r/ in the native phonology, but other repair strategies are of course possible. The Richness of the Base hypothesis (Kurusu, 2000; McCarthy, 2002; Prince & Smolensky, 1993/2004; Smolensky, 1996) requires us that we posit an underlying form with an initial /r/ even for Yamato words, and that such words do not surface faithfully.

<sup>8</sup>There are exceptions to word-initial prohibition against voiced obstruents (e.g. /damasu/ ‘to deceive’), but there are exceptions to word-initial prohibition against /r/ as well (/risu/ ‘squarrel’; see also footnote 3 of Labrune 2014). See Tanaka & Yashima (2013) for the experimental evidence for the psychological reality of word-initial prohibition against voiced obstruents in native Japanese phonology. As far as I know, there are no psycholinguistic studies on the prohibition against word-initial /r/.

substantially across phonetic contexts, dialects, and speech styles. I do not disagree with this observation. Phonetic variability of segments, however, in and of itself does not mean that that structure is phonologically empty. For example, as shown in Table 1, [+voice] in English is realized differently phonetically across phonetic contexts—for example, there is much voicing during closure intervocalically, but not word-initially or word-finally (Kingston & Diehl, 1994; Lisker, 1986). However, this phonetic variability is not usually taken to be evidence that English [+voice] is phonologically empty.

Table 1: Variable phonetic realizations of English [+voice] consonants. Adapted from Kingston and Diehl (1994: 427)

	[+voice]
utterance-initial or pre tonic	shorter lag VOT F <sub>1</sub> lower F <sub>0</sub> lower weaker burst
intervocalic or posttonic	closure voicing shorter closure longer preceding vowel F <sub>1</sub> lower F <sub>0</sub> lower
utterance-final or postvocalic	longer preceding vowel closure voicing possible shorter closure F <sub>1</sub> lower

In general, it is not unusual for one phonological segment to receive different phonetic realizations across different phonetic context—the variability often appears exaggerated when speech style differences and dialectal differences are taken into consideration. In short, /r/ is not special in receiving various phonetic realizations (see Kingston et al. 2012 for a more recent discussion on this issue).

Labrune (2014) also argues that /r/ is epenthetic<sup>9</sup>—to the extent that /r/ is phonologically contentless and there are mechanisms to fill its content, this observation makes sense, because epenthesis can simply insert an empty phonological slot, and the rest can be taken

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<sup>9</sup>Whether /r/ can be epenthetic in Japanese or in any other languages in general is debatable (see de Lacy 2006; Lombardi 2002; Staroverov 2014), although I do not have strong arguments against this view from Japanese. One point to note, however, is that evidence from verbal inflection patterns, used by Labrune (2014) (pp.10-12), should probably not be used for phonological argumentation, because “phonological” changes in verbal inflection patterns in Japanese are not replicated with nonce words (Batchelder, 1999; Griner, 2001; Vance, 1987, 1991), and it is likely that Japanese speakers store all the inflected verbal patterns in their memories (see also Kobayashi et al. 2012 on neurolinguistic insights on this issue).



care of by taking a “free-ride” (McCarthy, 2005) of default feature insertion mechanisms. This view of epenthetic segments was in fact not uncommon (Archangeli, 1984; Abaglo & Archangeli, 1989; Ito, 1986), when the underspecification theory was widely accepted, but has been much argued against, based on the fact that epenthetic segments in some languages are not completely phonologically inert (Davis, 1995; Steriade, 1995).

Third, Labrune (2014) states that /r/ is unstable, citing some sporadic examples in which /r/ is deleted or inserted (synchronically or diachronically) (p. 7). However, this argument is based on sporadic examples, and /r/ is not the only segment that is deleted or inserted sporadically (e.g. /kawai → /kaai/ ‘cute’ and /daia → /daija/ ‘diamond’).

Finally, Labrune (2014) uses vowel coalescence across /r/ in the Ryukyuan languages in an attempt to support the phonological emptiness of /r/ in (Standard) Japanese. However, it is dangerous to use data from one dialect to argue for a phonological nature of a structure in another dialect, let alone from a different language—Ryukyuan and Japanese were separated apart during the first few centuries AD (Thomas, to appear), and it would be a stretch to assume that they still retain the same phonological system.

## 6 Conclusion

Three restrictions on /r/ discussed by Labrune (2014) all come with exceptions, suggesting that these restrictions are better expressed in terms of violable constraints. Two out of the three restrictions—prohibition at word-initial position and prohibition against gemination—are not exclusively about /r/, and the structural account fails to account for these observations. Alternative analysis making use of violable constraints are better suited to model the phonological characteristics of /r/.

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