

Phonological and Familiarity Effects on Adjective Truncation in Japanese

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Contents

1	Introduction	2
2	Well-formed Adjective Truncation	2
2.1	Background	2
2.2	OT Analysis	3
3	Three Constraints for Adjective Truncation	5
3.1	Phonological Constraint 1: Adjectives Ending in /ii/ or /ee/	5
3.1.1	Data Description	5
3.1.2	OT Analysis	6
3.1.3	More Data	8
3.2	Phonological Constraint 2: Monomoraic Root Adjectives	9
3.2.1	Data Description	9
3.2.2	OT Analysis	10
3.3	Familiarity Constraint: Unfamiliar Adjectives	10
3.3.1	Data Description	10
3.3.2	OT Analysis	11
4	Conclusion	13

1 Introduction

Japanese has two types of adjectives:

(1) a. **Canonical Adjectives**

akai, osoi, samui, utukusii
red slow cold beautiful

b. **Nominal Adjectives**

sizuka, kirei
quiet beautiful

- The two types of adjectives differ morphosyntactically, but not semantically (c.f., *utukusii* vs. *kirei*)
- Canonical adjectives (hereafter *adjectives*) end in /i/.

This talk discusses the truncation of Japanese adjectives as in (2).¹

- (2) akai → aka!
red
'so red!'

Empirical Contributions

I will present that three types of adjectives resist truncation in Japanese.

1. Adjectives ending in /ii/
2. Monomoraic root adjectives
3. Unfamiliar adjectives

Theoretical Contributions

I will demonstrate that Japanese adjective truncation can be captured in the Optimality Theory (OT) *for free* using the existing constraints.

2 Well-formed Adjective Truncation

2.1 Background

Iwasaki (2014) classifies examples like (2) as a type of *internal expressive expression* (IEE), which need not involve an adjective.

¹Given that the final /i/ in Japanese adjectives is a non-past tense suffix (e.g., Urushibara 1993; Nishiyama 1999), one might analyze utterances like *aka!* as consisting solely of adjective roots, without truncation. However, this analysis struggles to account for the constraint discussed in Section 3.1.

- (3) a. zisin-da!
 earthquake-Cop(ula)
 ‘Earthquake!’

He notes that IEEs exhibit a few distinctive properties:

1. **Lack of communicative intent**

- Reveal what the speaker perceives or senses internally.
- Contrast sharply with “descriptive sentences”.

2. **Lack of grammatical subject**

- (4) a. *kore-wa zisin-da! (*: when interpreted as an IEE)
 this-Top(ic) earthquake-Cop
 ‘This is an earthquake!’

3. **Impossible to co-occur with a past tense**

- (5) a. *zisin-da-tta! (*: when interpreted as an IEE)
 earthquake-Cop-Past
 ‘It was an earthquake!’

2.2 OT Analysis

When adjectives are used as IEEs, truncated forms are generally preferred. Why is this the case?

- (6) aka! >> akai!
 ‘so red!’

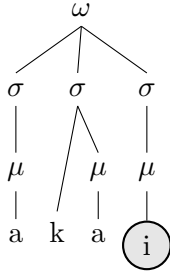
Claim: Truncated forms are favored because they eliminate vowels in hiatus.

Kubozono et al. (2002) argue that vowel hiatus motivates the following sound changes:

- (7) a. naga + ame → nagame
 long rain long.rain
 b. ko + ame → kosame
 small rain small.rain
 c. te + arai → tarai
 hand wash basin
 d. sugoi → sugēe
 amazing amazing

Following Moraic Phonology (e.g., Hyman 1984; McCarthy and Prince 1999; Hayes 1989), I assume that *aka!* has the following structure, where the circled *i* indicates the truncated element.

(8) Structure of $\checkmark$ *aka!*:



- The sequence /ai/ is not treated as a diphthong, since /a/ and /i/ do not belong to the same morpheme (e.g., Kubozono 2001); the /i/ is a non-past tense suffix (e.g., Nishiyama 1999).
- As a result, /ai/ constitutes a case of vowel hiatus.

When adjectives are used as IEEs, they undergo deletion rather than resolving hiatus through insertion (cf. (7b)). To account for this pattern, I consider the ranking of three output-output correspondence constraints: (i) the markedness constraint *Onset*, which essentially penalizes vowels in hiatus by penalizing onsetless syllables; (ii) the faithfulness constraint *MAX*, which penalizes deletion; and (iii) the faithfulness constraint *DEP*, which penalizes insertion.

- (9) a. **Onset**: Syllables must have onsets. (e.g., Prince and Smolensky 2004)
- b. **MAX**: Every segment in the base output has a correspondent in the derived output (e.g., McCarthy and Prince 1995, Benua 1997)
- c. **DEP**: Every segment in the derived output has a correspondent in the base output (e.g., McCarthy and Prince 1995, Benua 1997)

Assuming that *DEP* and *Onset* outrank *MAX*, we correctly predict that *aka!* surfaces as the optimal form.²

Base: a.ka.i	DEP	Onset	MAX
a.ka.i!		**!	
☞ a.ka!		*	*
a.k.i!		**!	*
a.ka.si!	*	*!	

- *a.ka.i!* is identical to the base form.
- *a.ka!* results from truncating the final /i/ to eliminate vowel hiatus.
- *a.k.i!* results from truncating the penultimate vowel /a/ to resolve the hiatus.
- *a.ka.si!* involves insertion of /s/ to break up the vowel sequence.

²In the OT tableau below, *akashi!* is correctly ruled out. However, note that insertion is sometimes permitted when it results in gemination of the root-final consonant. For instance, *akka!* is attested and natural (e.g., Iwasaki 2014). Such geminate-truncated adjectives serve to intensify the adjective's meaning (e.g., *akka!* 'extremely red!' vs. *aka!* 'so red!'). This suggests that, in some expressive contexts, DEP violations may be tolerated or even preferred when they yield geminate forms.

Recall that the constraints in (9) are output-output correspondence constraints. Thus, the ranking used in the tableau above is fully compatible with the fact that *akai* is the optimal form in non-truncated contexts, such as in sentences like *This is red*. In such cases, deletion of the final /i/ results in ungrammaticality, partly due to the ranking of input-output correspondence constraints, and partly because of syntactic requirements—specifically, the necessity of overt material in the TP head.³

3 Three Constraints for Adjective Truncation

This section examines three previously unrecognized constraints on adjective truncation in Japanese.

3.1 Phonological Constraint 1: Adjectives Ending in /ii/ or /ee/

3.1.1 Data Description

I observe that adjectives ending in /ii/ resist truncation.⁴

- (10) ✓ *akai!* ✓ *osoi!* ✓ *samui!* *?*tanosii!*
 ‘so red!’ ‘so slow!’ so cold! so fun!

I conducted a pilot study:

(11) Experiment Design

- a. **Participants:** five native Japanese speakers.
- b. **Items:** 40 adjectives/participant (200 in total)
 - i. Adjectives ending in /ai/: 10
 - ii. Adjectives ending in /oi/: 10
 - iii. Adjectives ending in /ui/: 10
 - iv. Adjectives ending in /ii/: 10
- c. **Scale:** 4-point scale (1 = very unnatural, 4 = very natural)

Mean acceptability ratings revealed systematic differences across vowel endings.

/ai/	/oi/	/ui/	/ii/
3.94	3.94	3.74	2.90

Table 1: Mean acceptability ratings for truncated adjectives by final vowel type. Scale: 1 = very unnatural, 4 = very natural.

Iwasaki (2014) also observes that adjectives like *tanosi!* ‘so fun!’ is degraded, generalizing:

(12) Iwasaki’s (2014) generalization

Emotion and feeling adjectives (e.g., *kuyasii* ‘regrettable’) do not allow truncation unlike perception adjectives.

³The absence of a non-past tense suffix in utterances like *aka!* is not problematic, as IEEs are never marked for past tense. See (5).

⁴Desiderative adjectives formed from a verb and the suffix *-ta(i)* like *nomi-tai* ‘drink-want’ resist truncation, even when they end in /ai/.

- **Emotion:** mental states that are impulsive and automatic (e.g., happiness, sadness, embarrassment, or sympathy)
- **Feeling:** mental state given rise to by emotions and other factors (e.g., perception of a certain state of the body, perception of a certain mode of thinking and of thoughts with certain themes)

I observe that this generalization appears to lead to both overgeneration and undergeneration:

(13) a. **Overgeneration:**

*?ataras**ii**! *?ook**ii**!
‘so new!’ ‘so large!’

- These adjectives are not emotion/feeling adjectives, yet their truncated forms sound degraded.
- What these adjectives share is that they end in /ii/.

b. **Undergeneration:**

✓tur**ai**! ✓sind**oi**!
‘so tough/hard/difficult/painful!’ ‘so tired/mentally tired/overwhelmed!’

- These adjectives are emotion/feeling adjectives, yet their truncated forms sound natural.
- What these adjectives share is that they do not end in /ii/.

Explaining the ill-formedness in terms of meaning fails to capture the contrast in naturalness observed in minimal pairs like the following:

- (14) a. ✓kakkoy**oi**! *?kakkoi**ii**!
‘so good-looking!’ ‘so good-looking!’
- b. ✓kimotiy**oi**! *?kimoti**ii**!
‘so comfortable!’ ‘so comfortable!’

- The minimal pairs in (14a) and (14b) share the same meanings, yet only the first items sound natural.
- A common pattern in both (14a) and (14b) is that truncated forms are degraded when the base adjective ends in /ii/.

These items were tested in my pilot experiment as well.

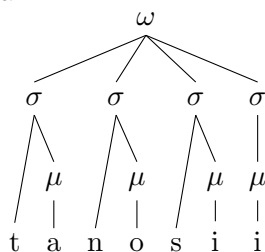
kakkoyoi-type adjectives	kakkoi-type adjectives
3.70	2.59

Table 2: Mean acceptability ratings for minimal pairs of truncated adjectives. Scale: 1 = very unnatural, 4 = very natural.

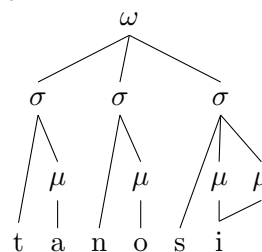
3.1.2 OT Analysis

I assume that adjectives ending in /ii/ have the structure in (15b), rather than (15a).

(15) a.



b.



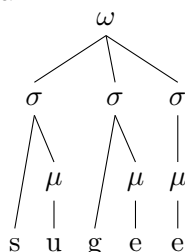
While the final /i/ in adjectives is a non-past tense suffix, I propose that the two /i/s in /ii/ form a single syllable, based on vowel coalescence data such as in (16), following Kubozono et al. (2002).

(16) sugoi → sugēe
amazing amazing

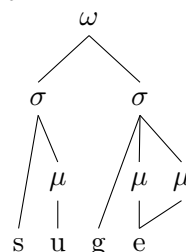
- *sugoi* is subject to vowels in hiatus (see Section 2.2).

Kubozono et al. (2002) argue that *sugoi* undergoes vowel coalescence to repair vowel hiatus. Accordingly, they assume that the resulting form *sugēe* has the structure shown in (17b), rather than (17a).

(17) a.



b.



Building on the analysis in (17b), I assume that standard adjectives ending in /ii/ share the same prosodic structure as in (15b). This structural assumption explains why **tanosi!* is preferred over **tanosi!*—it is not possible to delete only the final /i/ without also deleting the penultimate one, given their moraic unity.

Within the OT framework, *ta.no.sii!* emerges as the optimal form: *ta.no.sii!* does not contain vowels in hiatus and violates none of the three relevant constraints.⁵

(18)

Base: ta.no.si.i	DEP	Onset	MAX
☞ ta.no.sii!			
ta.no.si!			*!
ta.no.si.si!	*!		

⁵This analysis undergenerates, however, since the OT constraints considered here are not specific to adjective truncation. For example, *zya* ‘then’ is a truncated form of *zyaa*, itself derived from the more formal *dewa* via vowel coalescence (see Kubozono 2019). The current analysis does not predict *zya* to be optimal.

3.1.3 More Data

Some Japanese adjectives end in /ii/ or /ee/ as a result of vowel coalescence.

- (19) a. **atui** → **atii**
 hot
 b. **itai** → **itee**
 painful

Iwasaki (2014) observes that such derived adjectives can undergo truncation.

- (20) a. **ati!**
 b. **ite!**

I also find the examples in (20a–b) to be acceptable in certain contexts:⁶

- (21) a. [Context: You touch something hot and reflexively shout:]
 ati!
 b. [Context: You stub your pinky toe on the dresser and reflexively shout:]
 ite!

However, truncated forms like those in (21) should be treated separately from the main data discussed in this paper, for two reasons:

1. *ati!/ite!* in the usage in (21) may be lexicalized.

→ Some derived adjectives via vowel coalescence hardly allow truncation:

akai ‘red’ → *akee* → ^{??}*ake!*⁷

2. It is uttered reflexively.⁸

→ *ati!* and *ite!* sound degraded when used non-reflexively (22).

- (22) a. [Reflexive use context: A person from Hokkaido comes to Tokyo for the first time in August and says the following the moment they step out of Haneda Airport.]
 ✓ **ati!** ✓ **atu!**
 b. [Non-reflexive use context: After spending a few days sightseeing in Tokyo, the same person once again feels uncomfortable with the outdoor heat and makes the following remark.]
 i. ^{??}**aa** (yappari) **ati!**
 ah after.all so.hot
 ii. ✓ **aa** (yappari) **atu!**
 ah after.all so.hot
- *aa* is used so that the truncated adjective is used non-reflexively (e.g., Iwasaki 2014).

Therefore, I set aside the acceptable use of truncated forms like *ati!* in this paper.

⁶The acceptability of the truncated forms in (21) is not predicted under Iwasaki’s analysis, since these adjectives would be categorized as feeling adjectives.

⁷Interestingly, *akke!* sounds better than *ake!* (similarly, *atti!* sounds better than *ati* in (22b)). This may suggest that maintaining the same number of moras in the derived form is a relevant factor for truncation in adjectives derived via vowel coalescence.

⁸A potential exception is that *kakeee*, derived from *kakkoii* via vowel coalescence, may allow truncation of one *e*, yielding *kakee!*, even in non-reflexive contexts.

3.2 Phonological Constraint 2: Monomoraic Root Adjectives

3.2.1 Data Description

I observe that monomoraic root adjectives tend to resist truncation.⁹

- (23) *yoi! *nai! *ii! ?koi!
 ‘so good!’ ‘nonexistent!’ ‘soo good!’ ‘so rich! (taste)’

Monomoraic words are generally dispreferred in many languages, including Japanese.

- (24) a. **hypocoristic name shortenings** (e.g., Poser 1984; Poser 1990; Itô 1990)
 Masashi → ✓ Masa, ✓ Maa, *Ma

- b. **days of the week** (e.g., Martin 1987)

- (24) kayoobi-mokuyoobi → ✓ *kaa-moku*, *kamoku
 Tuesday-Thursday Tuesday-Thursday, Tuesday-Thursday

- c. **Loanword truncation** (e.g., Itô 1990; Itô and Mester 1992; Suzuki 1995)
 building → ✓ biru, *bi

- d. **Phone number** (e.g., Itô 1990)

- (25) yon **goo** kyuu no san **nii** hachi yon
 4 5 9 - 3 2 8 4
 459-3284

- ‘5’ is usually *go*, and not *goo*.
- ‘2’ is usually *ni*, and not *nii*.

- e. **Chinese zodiac** (e.g., Kubozono et al. 2002)

- (26) **nee** usi tora **uu** tatu **mii** uma hituzi saru tori inu **ii**
 mouse ox tiger rabbit dragon snake horse sheep monkey rooster dog boar

- *nee* comes from *nezumi*.
- *uu* comes from *usagi*.
- *mii* comes from *mi*.
- *ii* comes from *inosisi*.

Unlike some other truncation phenomena in Japanese, however, truncated adjectives can surface as monosyllabic words if the syllable is heavy.¹⁰

- (27) a. **Loanword Truncation** (Itô 1990)

- **jiinzu* **hangaa*
 jeans hunger

- b. **Adjective Truncation**

- ✓ *tooi!* ? *ooi!*
 far many

⁹**ii!* likely sounds unnatural due to the /ii/ ending as well. It is unclear why ?*koi!* sounds more acceptable than other examples.

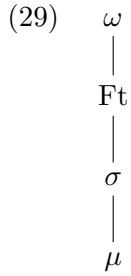
¹⁰*ooi!* sounds slightly less natural than *tooi!*. This may be because *tooi* allows accent placement on the second *o*, whereas in *ooi* the accent must fall on the first *o*. When truncated to *oo!*, the second *o* would receive the accent, potentially creating a mismatch.

3.2.2 OT Analysis

The minimality constraints discussed in Section 3.2.1 are often captured using the concept of foot binarity (e.g., Kubozono et al. 2002). Following this approach, I adopt the following two constraints to analyze adjective truncation.

- (28) a. GRWD=PRWD: A grammatical word must be a prosodic word. (e.g., Prince and Smolensky 2004; Kager 1999)
 b. FT-BIN: Feet are binary under moraic or syllabic analysis (e.g., McCarthy and Prince 1999; Kager 1999)

Given the prosodic word hierarchy in (29), GRWD=PRWD requires that every prosodic word to have a foot, and FT-BIN requires every foot to be binary. Together, these constraints ensure that a well-formed word must contain at least two moras.



(30)

Base: yo.i	GRWD=PRWD	FT-BIN	DEP	Onset	MAX
yo.i!				*	
yo.i!	*			*!	
(yo)!		*			*!
yo!	*				*!

(31)

Base: too.i	GRWD=PRWD	FT-BIN	DEP	Onset	MAX
(too).i!				*!	
too!					*
(to)!		*!			**

3.3 Familiarity Constraint: Unfamiliar Adjectives

3.3.1 Data Description

I observe that unfamiliar adjectives resist truncation.

- (32)
- | Common Adjective | Uncommon Adjective | Pseudoword Adjective |
|---------------------|------------------------------|----------------------|
| ✓akai!
'so red!' | *?itokenai!
so guileless! | *sekitanai!
— |

(33)	More Common Adjective	Less Common Adjective
	?adokenai! 'so guileless!'	*?itokenai! so guileless!

I conducted a pilot study:

(34) **Experiment Design**

- a. **Participants:** five native Japanese speakers.
- b. **Items:** 600 words in total ((120 words)×(5 subjects)= 600)
 - i. Common adjectives: 40
ai]_{word}: 10, oi]_{word}: 10, ui]_{word}: 10, ii]_{word}: 10
 - ii. Uncommon adjectives: 40
ai]_{word}: 10, oi]_{word}: 10, ui]_{word}: 10, ii]_{word}: 10
 - iii. Pseudoword adjectives: 40
ai]_{word}: 10, oi]_{word}: 10, ui]_{word}: 10, ii]_{word}: 10
- c. **Scale:**
 - i. Acceptability: 4-point scale (1 = very unnatural, 4 = very natural)
 - ii. Familiarity: 3-point scale (1 = unfamiliar, 3 = familiar)
- d. **Procedure:**
 - Participants were told that all the adjectives exist though the usage frequency of each adjective varies a lot.
 - Participants first heard untruncated adjectives, rating its familiarity. Then they heard their truncated counterparts, rating its acceptability.

Mean acceptability ratings revealed systematic differences across vowel endings.

	/ai/	/oi/	/ui/	/ii/	kakkoyoi	kakkoii
Common	3.94 (3.00)	3.94 (3.00)	3.74 (2.94)	2.90 (2.98)	3.70 (3.00)	2.59 (3.00)
Uncommon	2.36 (1.98)	3.18 (2.70)	3.14 (2.56)	3.00 (2.20)		
Pseudo	1.40 (1.08)	1.66 (1.14)	1.44 (1.12)	1.80 (1.36)		

Table 3: Mean acceptability ratings for truncated adjectives by familiarity and final vowel type. Acceptability ratings: 1 = very unnatural, 4 = very natural. Familiarity ratings (1 = unfamiliar, 3 = familiar) shown in parentheses.

- The higher the familiarity ratings are, the higher acceptability ratings are given.

3.3.2 OT Analysis

The familiarity effect can be implemented using lexically indexed faithfulness constraints (e.g., Pater 2000; Coetzee 2008).

- (35)
- a. **MAX_{L1}**: MAX that evaluates only the lexical items with the index L1.
 - b. **MAX_{L2}**: MAX that evaluates only the lexical items with the index L2.
 - ...

c. MAX_{L_n} : MAX that evaluates only the lexical items with the index L_n .

English variably deletes t/d in final consonant clusters, with frequent words more likely to undergo deletion (e.g., Bybee 2000; Phillips 2006).

(36) *best option* vs. *yeast option*

- *t* of *best* is more likely to be truncated than that of *yeast*.

Suppose that *best* and *yeast* have the indexes L_1 and L_2 , respectively. Given this and the markedness constraint in (37), Coetzee (2008) captures the lexical difference between *best* and *yeast*.

(37) *Ct#V: No word-final [-Ct]/[-Cd] followed by a [V-] initial word. (Coetzee 2008)

(38)

Base: best option	MAX_{L_2}	*Ct#V	MAX_{L_1}
best _{L1} option		*!	
bes _{L1} option			*

(39)

Base: yeast option	MAX_{L_2}	*Ct#V	MAX_{L_1}
yeast _{L2} option		*	
yeas _{L2} option	*!		

Likewise, we can capture the difference between well-formed truncation of familiar adjectives (e.g., *aka!*) and ill-formed truncation of unfamiliar words (e.g., *itokena!*).¹¹

(40)

Base: a.ka.i	MAX_{L_2}	GRWD=PRWD	FT-BIN	DEP	Onset	MAX_{L_1}
(a.ka).i! _{L1}					**!	
(a.ka)! _{L1}					*	*

(41)

Base: i.to.ke.na.i	MAX_{L_2}	GRWD=PRWD	FT-BIN	DEP	Onset	MAX_{L_1}
(i.to).ke.na.i! _{L2}					**	
(i.to).ke.na! _{L2}	*!				*	

¹¹The current analysis still does not completely account for the acceptability variation among common, uncommon, and pseudoword adjectives, or gradient acceptability more generally. However, we should first conduct an experiment with a larger sample size and investigate if acceptability of truncation is indeed gradient in reference to their familiarity ratings.

4 Conclusion

Empirical Contributions

I presented that three types of adjectives resist truncation in Japanese.

1. Adjectives ending in /ii/ (e.g., **tanosi*ii*!*)
2. Monomoraic root adjectives (e.g., **yoi!*)
3. Unfamiliar adjectives (e.g., *itokenai!*)

Theoretical Contributions

I demonstrated that Japanese truncations can be captured in the Optimality Theory *for free* using the existing constraints.

- **Acceptable truncation:** Onset (i.e., Delete the ‘i’ to eliminate vowels in hiatus.)
- **Adjectives ending in /ii/:** MAX (i.e., Don’t delete the ‘i’ when its presence does not cause vowels in hiatus.)
- **Monomoraic root adjectives:** FT-BIN & GRWD=PRWD (i.e., Contain at least two moras in a truncated adjective.)
- **Unfamiliar adjectives:** MAX_n (i.e., Don’t delete the ‘i’ if the adjective is unfamiliar.)

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