

Syllable intrusion in Japanese puns, *dajare*

Kazuko Shinohara

(Tokyo University of Agriculture and Technology)

Shigeto Kawahara

(Rutgers University)

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The outline of the talk

- Introduction
- Method
- Results
- Discussion
- Conclusion

Introduction

- This study is a part of a larger project, which investigates linguistic knowledge of **similarity** by analyzing Japanese puns or *dajare* (Kawahara 2009a, also Kawahara's website).
- We show that, in composing puns, Japanese speakers define “**the measure of similarity with zero**” (i.e. similarity with absence of an element) based on various phonetic and psycholinguistic considerations.

Puns in Japanese

- Some Japanese speakers play with puns (*dajare*) on a daily basis.
- In composing puns, Japanese speakers create expressions using identical or similar sounding words/phrases.
- In most cases, two corresponding elements appear overtly in the punning sentence, but sometimes speakers can utter a sentence to imply another, similar-sounding famous expression (see below for examples).

Some patterns and examples

(1) Perfect puns (no mismatch)

arumikan-no ue-ni aru mikan
aluminum.can-GEN top-LOC exist orange
'An orange on an aluminum can.'

The correspondence portions involve the same sound sequences (setting aside an accentual difference).

(2) Imperfect puns: Consonantal mismatch (Kawahara & Shinohara 2009)

okosama-o okosanaide
kid-ACC don't wake up
'Don't wake up the kid.'

[m]-[n] mismatch

(3) Imperfect puns: Vocalic mismatch (Kawahara & Shinohara 2008)

Haideggaa-no zense-wa hae dek-ka?
Heidegger-GEN previous.life-TOP fly be-Q
'Was Heidegger a fly in his previous life?'

[i]-[e] mismatch

(4) Covert pairing

matcho-ga uri-no shoojo
macho-NOM specialty-GEN girl
'A girl who is proud of being a macho.'

‘Matchi-uri-no shoojo’ (Little Match Girl) is implied.

Cases under discussion today

(5) Syllable intrusion

Shopan-no shokupan.

Chopin-GEN bread

‘Chopin’s bread.’

[ku] is intruded.

bundoki-o bundottoki.

protractor-ACC take.away

'Take away the protractor (from him).'

[to] is intruded.

ribaundo shinai yooni ribaa-de undoo.
rebound do.not so.that river-LOC exercise
'I will exercise in the river so that I won't gain
weight again.'

A particle [de] is intruded.

Summary: 5 major types of puns (non-exhaustive)

- (1) Perfect puns (no mismatch)
- (2) Imperfect puns: Consonantal mismatch
- (3) Imperfect puns: Vocalic mismatch
- (4) Puns based on covert pairing
- (5) Imperfect puns: Syllable intrusion

Premises

1. In languages, speakers attempt to minimize the differences between corresponding segments (e.g. inputs and outputs) in general.

2. The measure of similarity has psychoacoustic or perceptual grounds.

(Steriade 2001/2008)

See Kawahara (2009b) for a review.

These premises are supported by the previous studies of language games such as half rhymes in rap lyrics (Kawahara 2007).

Our ongoing project aims to test these premises by studying Japanese puns.

Today's talk presents a part of this larger project on Japanese puns.

Applying the premises to puns

- 1' When pun-makers compose puns, they attempt to minimize the differences between corresponding elements in puns.
 - 2' In puns, the measure of similarity between corresponding elements has psychoacoustic or perceptual grounds.
- 1' and 2' have been supported by our previous studies on consonantal mismatches and vocalic mismatches in Japanese imperfect puns (Kawahara and Shinohara 2008, 2009).

The goal of this study

We further support these theses by analyzing **syllable intrusion** in Japanese puns. We demonstrate that:

1. Speakers minimize the difference between corresponding segments in syllable intrusion (zero vs. the intruded syllable).
2. The measure of similarity has psychoacoustic or perceptual grounds.
3. Psycholinguistic non-salience of affixal elements is also at work.

The Observation

Syllable intrusion is less frequent than other types of imperfect puns, perhaps because syllable intrusion can cause greater differences than other types of imperfect puns.

Nevertheless, when syllables are intruded, speakers prefer non-intrusive ones.

less intrusive, non-salient sounds



more intrusive, salient sounds

Method

- We analyzed puns with syllable intrusion: puns in which the second word contains an extra syllable in it.
- We collected examples from 17 summary websites of *dajare*, and elicited more examples from native speakers. We found about 3,200 examples with several types of mismatches (consonantal mismatch, vocalic mismatch, and syllable intrusion).
- Among them, we found a total of 149 examples of syllable intrusion (where each example had one extra syllable.)

Some methodological details:

We excluded examples where the intruded vowel forms a diphthong with the preceding vowel or is identical to the preceding vowel with no intervening consonant.

We also excluded cases that have other sound changes (e.g. combination with deletion of syllables or phonemes, metathesis, and so on.)

This process resulted in the total of 149 examples.

We then coded:

- the vowels in the inserted syllable.
- the vowels in the adjacent syllables.
- the morphological status of the intruded syllables.

We analyzed only vowels because:

- (i) vowels are (psycho-)acoustically more salient than consonants,
- (ii) the number of samples we obtained was not enough to analyze consonants.

We carried out the following analysis:

1. counted the number of each vowel /a, i, u, e, o/ to investigate which vowel is most frequently intruded,
2. compared the intruded vowel with adjacent vowels,
3. checked whether the intruded syllable is an affix or a part of a root.

Reliability

- Since we have only one sample of data, we calculated 95% percentile intervals using a bootstrap method.
- We created 50,000 samples using resampling with replacement, and calculated 95% percentile over those 50,000 samples (Efron and Tibshirani 1993).

Results

We found three major patterns of syllable intrusion.

- [1] Copies
- [2] High vowels
- [3] Affixes

[1] Copies

About 60% (89 out of 149) of the intruded vowels are copies from one or both of the adjacent syllables.

If copied, all kinds of vowels are allowed.

金縛りの悲しいヒバリ	(kanashij <u>i</u> hibari)
浅香光代に朝噛みつくよ	(asakamits <u>u</u> kuyo)
分度器をぶんどっとき	(bund <u>o</u> ttoki)
苦小牧にはトマト来まい	(toma <u>t</u> ok <u>o</u> mai)
アザラシが雨ざらし	(a <u>maz</u> arashi)

[2] High vowels

If not copied, **high vowels /i, u/** often appear in intruded syllables (46 out of 60 non-copies; 76.7%).

聖徳太子を消毒したいし (shoodoku**shitaishi**)
ショパンの食パン (shokupan)

[3] Affixes

Otherwise (i.e. non-copy, non-high) **affixal** vowels can intrude (11 out of 14 non-copy, non-high; 78.6%).

リバウンドしないようにリバー~~で~~運動 (ribaa-de undoo)

錦糸町へ行くのは 禁止~~で~~ちょう (kinshi-de choo)

コロンブス見て ころん~~だ~~ブス (koron-da busu)

Table 1: The distribution of intruded vowels

	u	i	o	e	a	Total
Copy	19	16	22	3	29	89
Non-copy	26	20	4	8	2	60
Affix	-	-	(2)	(7)	(2)	

(The instances of affixes are subsets of non-copies.)

- [1] Copying adjacent vowels is most common.
- [2] If not copied, **high vowels /i, u/** are frequent.
- [3] Otherwise **affixal** vowels can intrude.

Exceptions are only 3 out of 149 samples.

Reliability

Table 2: The bootstrap 95% percentile intervals of the intruded vowels.

	u	i	o	e	a
Copy	11-27	9-24	14-31	0-7	20-39
Non-copy	17-35	12-29	1-8	3-14	0-5
Affix	-	-	0-5	2-12	0-5

To summarize

In syllable intrusion:

- [1] Copies from **adjacent vowels** are most common.
- [2] If not copied, **high vowels /i, u/** are the next most frequent.
- [3] Otherwise **affixal** vowels can intrude.

What are the grounds for these patterns?
Are they based on psychoacoustic and/or psycholinguistic factors?

Discussion

Why these patterns?

All of the three patterns observed in the results seem to have **psychoacoustic** or **psycholinguistic** grounds.

Intruding syllables cause differences between corresponding words in puns; therefore the less salient the syllable is, (i.e., **closer to zero**), the better.

[1] Gounding for copied vowel intrusion

Human auditory systems are sensitive to changes (Delgutte 1999).

Our ears can get "bored" so that the continuation from the preceding vowel may not be considered intrusive.

e.g. Compare [a-a] and [a-o].

Therefore, copied vowels are presumably non-intrusive.

[2] Grounding for high vowel intrusion

High vowels /i, u/ are the shortest vowels and hence perceptually least intrusive (Howe and Pulleyblank 2004; Lehiste 1970; Steriade 2001/2008).

In Japanese, high vowels can devoice between voiceless consonants and other environments, and become less audible (Tsuchida 1997).

Evidence for non-salience of high vowels

Table 3: Phonetic durations of Japanese vowels.

[u]	[i]	[o]	[e]	[a]	sources
1.00	1.17	1.26	1.37	1.44	Han, 1962
62	70	88	93	99	Sagisaka, 1985 (in real words)
58	61	71	79	86	Sagisaka, 1985 (in nonce words)
58.3	69.8	77.7	80.0	83.7	Campbell, 1992
56.8	67.5	75.4	85.7	82.3	Arai, Warner, & Greenberg, 2001

The data from Han (1962) are ratios with respect to the duration of [u]. Otherwise they are in millisecond.

[3] Grounding for affix vowel intrusion

Morphological elements are non-salient psycholinguistically, so they can be ignored.

For example, Jarvella and Meijers (1983) conducted a task in which the participants were presented with multiple forms and asked to make a same/different judgment about “roots” or “forms” (inflection types). The participants responded quicker for pairs of roots than for pairs of “forms”.

(See Beckman 1997; Hawkins and Cutler 1988; Smith 2002 for further evidence.)

Summary

In short, speakers intrude syllables that are perceptually not salient.

(See Fleischhacker 2005 for a similar pattern in English.)

Parallels with natural language patterns

Interesting parallels exist between the syllable intrusion patterns in Japanese puns and phonological patterns in Japanese and other languages.

Parallels with phonological patterns

[1'] Many languages use copy vowels for epenthesis;
(Copy epenthesis)

Japanese:

Bach → **bahha**, Gogh → **gohho**, Zürich → **chuurihi**
(Kitto and de Lacy 1999; Kawahara 2004)

Kolami:

/ayk+t/ → [ayakt] ‘swept away’	cf. /ayk/ → [ayk]
/erk+t/ → [erekt] ‘lit (fire)’	cf. /erk/ → [erk]

(Zou 1991: 463)

[2'] High vowels are often used as epenthetic segments;
(High vowel epenthesis)

Japanese:

spark → supaaku, cake → keeki

(Howe and Pulleyblank 2002; Steriade 2001).

Turkish:

	NOM.SG	3.POSS	
[i]	fik <i>jir</i>	fik <i>j</i> r-i	'idea'
[u]	koju <i>n</i>	kojn-u	'bosom'

(Howe and Pulleyblank 2002: 11)

[3'] Languages prefer to copy materials from roots than those from affixes in reduplication (Nelson 2003: 39; Spaelti 1997: Chapter 4; Urbanczyk 2007).

Affixal segments are more easily ignored than root segments in reduplication.

e.g. Axininca Campa (McCarthy and Prince 1993: 63)

[root]	[reduplicated word]	[gloss]
kawosi	noŋ-kawosi- kawosi -wai-t-aki	'bathe'
tʰaaŋki	noŋ-tʰaaŋki- tʰaaŋki -wai-t-aki	'hurry'
kintʰa	noŋ-kintʰa- kintʰa -wai-t-aki	'tell'

Conclusions

- Speakers attempt to minimize the difference between corresponding segments in syllable intrusion in puns (zero vs. the intruded syllable).
- The measure of similarity has psychoacoustic or perceptual grounds.
- Psycholinguistic non-salience of affixal elements may also be at work.

Implications 1

Our results support Steriade's (2001/2008) argument.

1. In languages, speakers attempt to minimize the differences between corresponding segments (e.g. inputs and outputs) in general.
2. The measure of similarity has psychoacoustic or perceptual grounds.

Implications 2

Perceptual aspects of sounds (phonetics and phonology) can be an interesting topic in cognitive linguistics.

Collaboration between phonologists/phoneticians and cognitive linguists has not been much pursued. A collaborative effort between these researchers may create a new and interesting field of study.

Appendix

Copying is more likely from the preceding vowel than from the following vowel.

Table 4: Directionality of copying

	u	i	o	e	a
From the preceding vowel (only)	11	8	15	3	18
From the following vowel (only)	4	5	3	0	2
From both	4	3	4	0	9

Table 5: The bootstrap 95% percentile intervals of vowels copied from each direction.

	u	i	o	e	a
From the preceding vowel (only)	5-17	3-14	8-22	0-7	11-26
From the following vowel (only)	1-8	1-10	0-7	0	0-5
From both	1-8	1-10	1-8	0	1-8

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Other papers related to this project as well as topics for future research are outlined on the second author's website.

The bootstrapping analyses reported in this talk were conducted using R (<http://www.r-project.org/>). The source codes are available from the second author upon request.

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