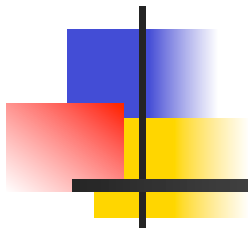


[-zu], An Initial Accenting Suffix: Experimental studies

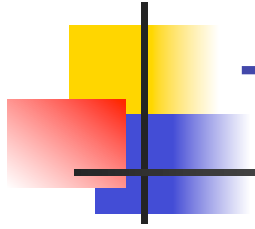


Formal Approaches to Japanese
Linguistics 5, UCSC

Sophia Kao &

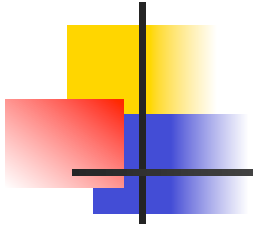
Dr. Shigeto Kawahara

Rutgers University



The outline of the talk

- Introduction
- Experiment I: wellformedness judgment test
- Experiment II: multiple-choice test
- General discussion



General Introduction



Locality of affix-controlled accentuation?

- Many languages have affixes that assign accents onto the root.
- The accent assigned by those post-accenting and pre-accenting affixes has to be invariably local (Kurisu 2001; Revithiadou 2008).
- Examples from Japanese:
 - /ma-minami/ => [ma-**mi'**nami] 'truly South'
 - /minami-ke/ => [minami'**-ke**] 'the house of Minami'



Japanese suffix [-zu]

- A new Japanese suffix [-zu] shows non-local pre-accentuation (Kawahara & Wolf 2010).
- Loanword from the English plural suffix “-s”, used to form group.
 - e.g. [raion-zu], [samaa-zu], [janii-zu].
- [-zu] assigns a root-initial accent, accompanied by lengthening of the root-final syllable
 - [sama']=>[sa'maa-zu] (Comedian name).
 - [raion]=>[ra'ion-zu] (Baseball team name).



Why [-zu] is interesting

- Initial accenting behavior exemplifies non-local affix-controlled accentuation.
- Current theories of morpheme realizations in fact predict that such non-local accentuation is possible (see Kawahara & Wolf 2010 for details).
- Thus [-zu] would fill an otherwise puzzling typological gap.



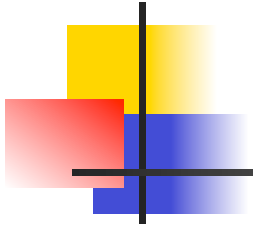
Kawahara & Wolf's elicitation study

- Their study:
 - An elicitation study with 16 native speakers.
- Their findings:
 - [-zu] assigns a root-initial accent on unaccented and finally accented roots.
 - Non-final root accents are preserved.

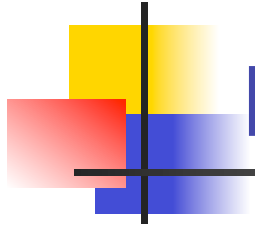


The current studies

- Problems:
 - syllable and morphological structures were not controlled.
 - real words were used for stimuli.
 - some speakers did not show initial accenting, but resorted to the default antepenultimate accentuation.
- The current studies:
 - **controlled** syllable and morphological structures.
 - used **nonce words** to test the true productivity of the root-initial accentuation.
 - used **auditory** rather than orthographic stimuli.

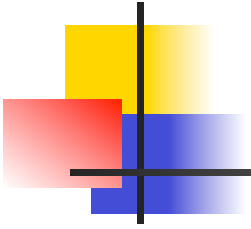


Experiment I



Experiment I

- A wellformedness judgment test.
- The participants were asked to judge the naturalness of the accent patterns of monomorphemic words and zu-words.



Method

Experiment I: Method, Stimuli

	Monomorphemic (baseline condition)	Zu-words (Target)	
		Unaccented root and zu-words	Accented root and zu-words
Initial	[na 'rigumaada]	[chiyogise] -> [chi 'yogiseezu]	[seri 'ponu] -> [se 'riponuuzu]
Antep.	[narigu ma 'ada]		

10 items per condition



Experiment I: Method, Stimuli

- The monomorphemic words (baseline condition)
 - **Initial accent**: ill-formed words (Kubozono 2008)
 - **Antepenultimate accent**: default pattern (McCawley 1968)
- The zu-words (target)
 - **Unaccented root**: end with non-epenthetic vowels
 - **Accented roots**: end with epenthetic vowels (Kubozono 1994)



Prediction

- Prediction: Speakers prefer antepenultimate accents for monomorphemic words, but initial accents for zu-words.



Experiment I: Method, Recording

- A native female speaker of Japanese pronounced all the stimuli in a sound attenuated booth.
- The recorded stimuli were edited out at zero crossing, with the average amplitude modified to 65dB using Praat (Boersma & Weenink, 1999-2010).
- Every zu-word root and its derived zu-word were concatenated with a 500 ms inter-stimulus interval.



Experiment I: Method, Procedure

- All stimuli were embedded to an online questionnaire through Sakai (<https://sakai.rutgers.edu/portal>).
- The demo site: <http://tinyurl.com/ydvoend>



Experiment I: Method, Procedure

- The experiment was organized into 2 main blocks separated by a break sign:
 - Part I: **monomorphemic word** stimuli with initial and antepenultimate accents.
 - Part II: **zu-words** preceded by their roots.



Experiment I: Method, Procedure

- The participants were asked to listen to each stimulus, and then judge the naturalness of accentuation.
- A 5-point scale rating (provided in Japanese):
 - **(5) very natural**
 - (4) somewhat natural
 - (3) neither natural nor unnatural
 - (2) somewhat unnatural
 - **(1) very unnatural**

Experiment I: Online Test

「ズ」のアクセント (D)

Part 6 of 7 - 読問2

Block2--zu words

Question 29 of 51



この「ラソボワ」から作られた「ラソボワーズ」のアクセントはどのくらい自然ですか？

- A. とても自然
- B. やや自然
- C. どちらとも言えない
- D. やや不自然
- E. とても不自然

[Reset Selection](#)

Save and Continue

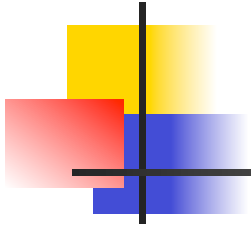
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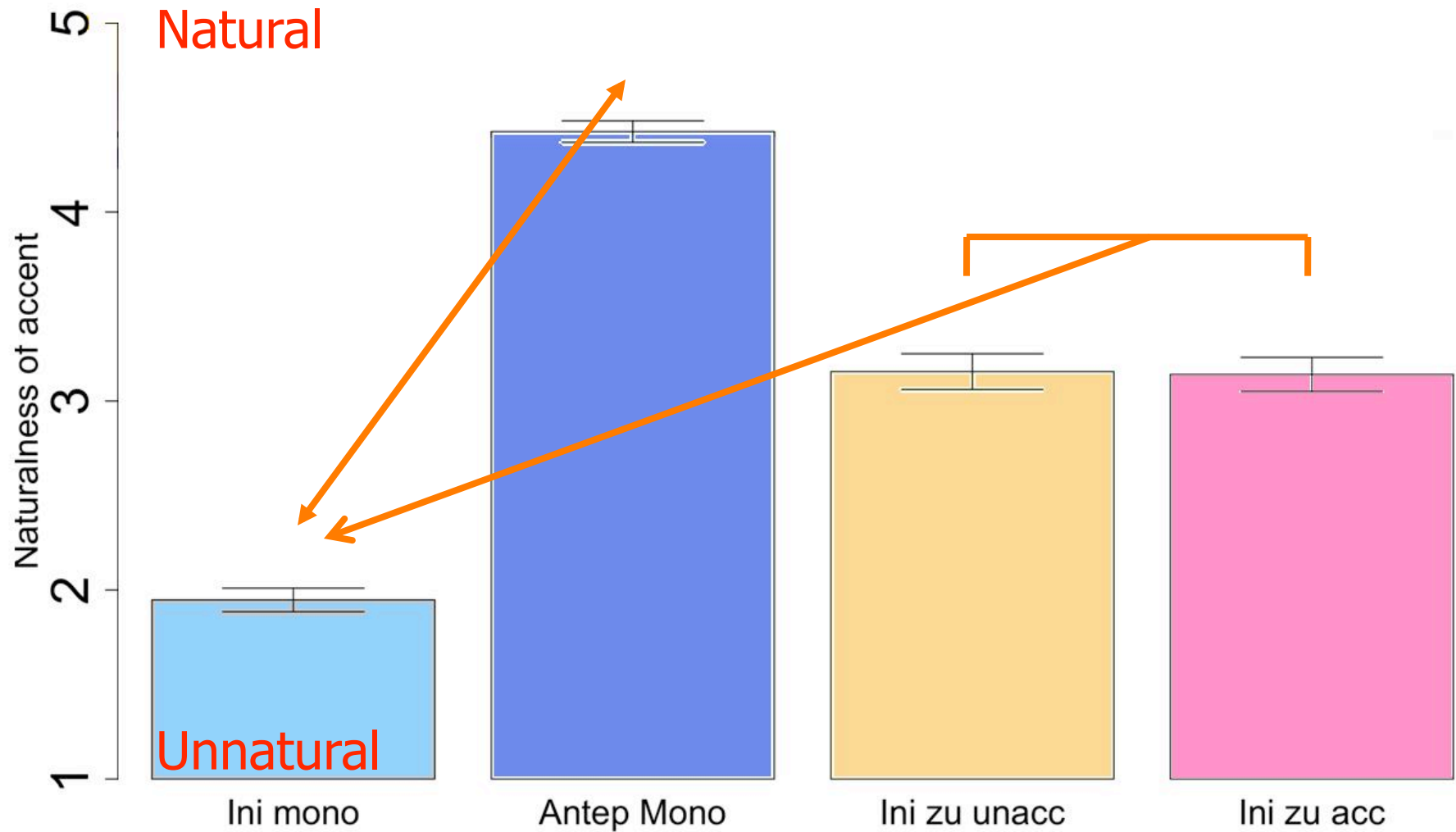
Experiment I: Method, Analysis

- 77 native speakers of Japanese have participated.
- Statistics: a mixed linear model (Baayen 2009) using R (R Core Development Team 1993-2010).



Results & Discussion

Experiment I: Results



The average rating of the naturalness of accents. The error bars represent the 95% confidence intervals.



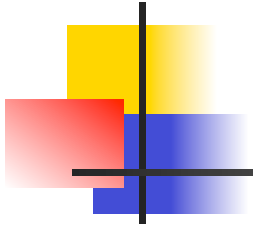
Experiment I: Results

- The initial accenting zu-words show a higher rating than the initial accenting monomorphemic words ($p < .001$).
- The initial accenting zu-words show a lower rating than the antepenultimate pronunciation of monomorphemic words ($p < .001$).
- The average rating of zu-words derived from accented roots was only slightly higher than zu-words derived from unaccented roots ($p < .05$). However, the magnitude of the difference is very small (0.02).



Experiment I: Discussion

- Some questions:
 - Experiment I did not include the antepenultimate accentuation in zu-words.
 - It did not include [-zu] forms that preserve root accents, which speakers of Kawahara & Wolf's study preferred.

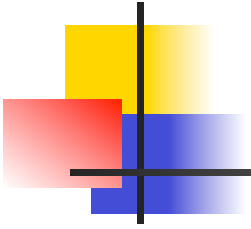


Experiment II



Experiment II

- A multiple-choice test.
- The participants were asked to choose the accentual pattern that sounds most natural to them.



Method



Experiment II: Method, Stimuli

	Monomorphemic	Unaccented root and zu-words	Accented root and zu-words
Initial	[ga 'yohamooda]	[mo 'pesenoozu]	[za 'mesokuuzu]
2nd syllable	[gayo' h amooda]	[mope' s enoozu]	[zame' s okuuzu]
Antep.	[gayoha mo 'oda]	[mopese no 'ozu]	[zameso ku 'uzu]

10 items per condition



Experiment II: Method, Stimuli

- The same set of nonsense words from Experiment I.
 - 3 options on the accentual patterns:
 - (1) initial accent
 - (2) accent on the second syllable
 - (3) antepenultimate accent
- Accents on the second syllables are those that would preserve the root accents.
 - e.g. [so**ku**'demu] => [so**ku**'demu-zu]

Experiment II: Online Test

ズのアクセント2

Part 5 of 6 - 第二部

Question 19 of 40

まずは下の無意味語「ソクテム」の発音を聞いてください。



この無意味語に「ーズ」をつけたときにもっとも自然なアクセントパターンはどれですか？

- A.
- B.
- C.

[Reset Selection](#)

Save and Continue

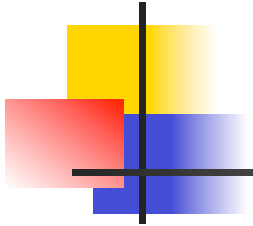
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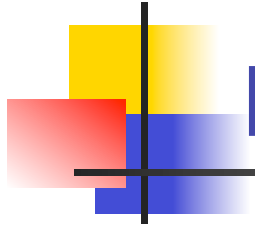


Experiment II: Method, Procedure

- The procedure is almost identical to Experiment I.
- The participants were asked to listen to three accentual patterns, then choose the most natural one.
- The order of the stimuli within a question was randomized by Sakai.
- 40 native speakers of Japanese participated in the experiment.

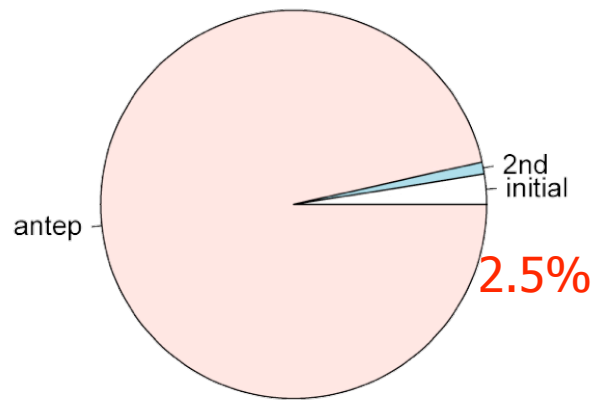


Results & Discussion

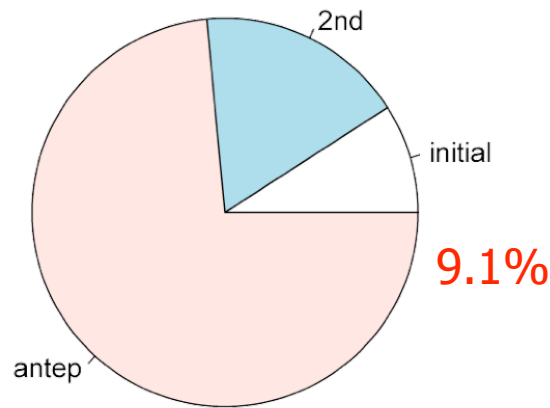


Experiment II: Results

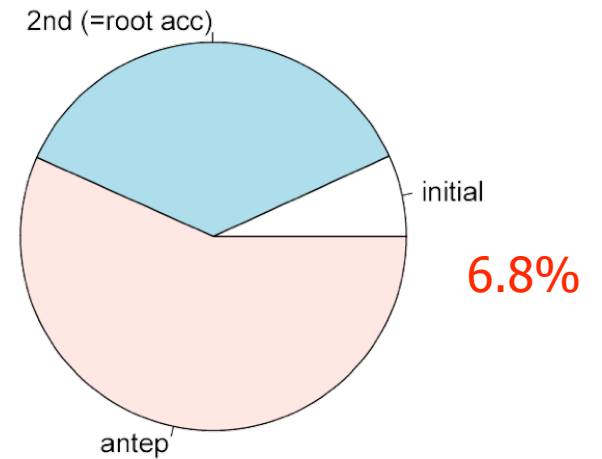
monomorphemic



zu of unacc. roots



zu of acc. roots



The percentages of choices that were judged to be most natural.

Experiment II: Results

	Monomorphemic	Unaccented root and zu-words	Accented root and zu-words
Initial	2.5% [ga'yohamooda]	9.1% [mo'pesenoozu]	6.8% [za'mesokuuzu]
2nd syllable	1.0% [gayo'hamooda]	17.4% [mope'senoozu]	36.5% [zame'sokuuzu]
Antep.	96.5% [gayohamo'oda]	73.5% [mopeseno'ozu]	56.7% [zamesoku'uzu]



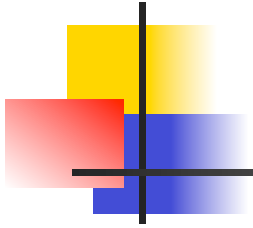
Experiment II: Results

- The zu conditions produced more initial accenting responses than the monomorphemic condition (Wilcoxon test, $p < .01$).
- The difference between accented roots and unaccented roots was not significant.



Experiment II: Discussion

- Overall initial accenting in zu-words is not the best choice (in four syllable words).
- However, zu-words do show more initial accenting responses than monomorphemic words.
- Initial accenting in zu-words is possible, but not best.
- Given accented roots, speakers did often choose words that preserved root accents (54.5%).



General Discussion



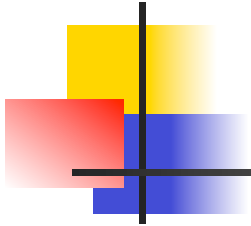
General discussion

- UG allows non-local affix-controlled accentuation.
- Initial accenting in zu-words is more acceptable than initial accenting in monomorphemic words.
- However, antepenultimate accent may be better than initial accenting in (some) zu-words.
- Not all grammatical forms are equally acceptable (Coetzee 2009).



Acknowledgments

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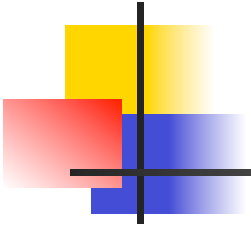


- Efficiency of (sound-based) online experiments. They do not control for listening environments, but allow us to run linguistic experiments very efficiently.
- We obtained responses from more than 120 Japanese speakers (while the research was done in the US).



Is the initial accenting due to TETU?

- A possibility raised by Alan Prince (p.c.): Japanese speakers liked initial-accenting in general before [-zu] existed.
- The preference for initial accenting was overridden by the preference toward antepenultimate accenting.
- [-zu] for some reason suppressed that preference for antepenultimate accenting.
- Initial accentuation due to [-zu] is thus the emergence of the unmarked (TETU) (McCarthy and Prince 1994).



- The prediction: Speakers who like initial accenting in monomorphemic words would also like initial accenting in zu-words i.e. there would be some correlation between these two conditions.
- However, there was no significant correlation between the ratings of initial accenting in the monomorphemic condition and the [-zu] conditions (A spearman correlation test, *n.s.*).



The Stimulus List

Mono. (initial)	Mono. (antep)	Unacc. root	Unacc. w/zu	Acc. roots	Acc. w/zu
[kúyaminaada]	[kuyamenáada]	[mifusoni]	[mífusoniizu]	[sokúdemu]	[sókudemuuzu]
[wábinohaada]	[wabinoháada]	[numasedo]	[númasedoozu]	[kenízayu]	[kénizayuuzu]
[mákenuraada]	[makenuráada]	[darakuri]	[darakuriizu]	[robáyumu]	[róbayumuuzu]
[gáyohamooda]	[gayohamóoda]	[chiyogise]	[chíyogiseezu]	[zamésoku]	[zámesokuuzu]
[rámowamiida]	[ramowamíida]	[buhamera]	[búhameraazu]	[gunáredo]	[gúnaredoozu]
[nárigumaada]	[narigumáada]	[mopeseno]	[mópesenoozu]	[seríponu]	[séríponuuzu]
[hídarameeda]	[hidaraméeda]	[hamarake]	[hámarakeezu]	[wamáhibo]	[wámahibozu]
[póyasetaaada]	[poyasetáada]	[kayadoni]	[káyadoniizu]	[nobíwaru]	[nóbiwaruuzu]
[mígoseteeda]	[migosetéeda]	[zokomare]	[zókomareezu]	[tarúzonu]	[táruzonuuzu]
[zóritapeeda]	[zoritapéeda]	[rasobowa]	[rásobowaazu]	[renégunu]	[rénegunuuzu]

Experiment I part I

「ズ」のアクセント (D)

Part 4 of 7 - 設問1

Block 1--monomorphemic stems

Question 9 of 51



この「ワピノハーダ」のアクセントはどのくらい自然ですか？

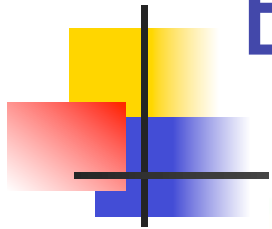
- A. とても自然
- B. やや自然
- C. どちらとも言えない
- D. やや不自然
- E. とても不自然

[Reset Selection](#)

Save and Continue

Submit

Quit



Experiment II part I

ズのアクセント2

Part 3 of 6 - 第一部

Question 7 of 40

無意味語「ナリダマーダ」を発音するとしたら、もっとも自然なアクセントパターンはどれですか？

- A. 
- B. 
- C. 

[Reset Selection](#)

Save and Continue

Submit

Quit