

# Prosodic Focus and Nominative/Accusative Alternation in Japanese \*

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## 1 Introduction

From an empirical perspective, this article examines effects of adjacency in the Nominative/Accusative Alternation in Japanese (hereafter NAA), exploring their relationship to information structure (e.g., Vallduví 1992; Lambrecht 1994; Erteschik-Shir 2007) as realized prosodically. NAA is a case alternation between the nominative case particle *ga* and the accusative case particle *o* for object, which occurs with potential and desiderative predicates (e.g., Shibatani 1975).<sup>1</sup>

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<sup>1</sup> There is another phenomenon where the nominative *ga* and the accusative *o* can alternate, which is known as Exceptional Case Marking (ECM) (cf. Kuno 1976; Ura 1994). We did not include this phenomenon in our study, because the syntactic mechanism is completely different from NAA. The following (i) is an example of ECM.

(1) Potential predicates

- a. Taro-wa zyoozuni eigo-**ga/o** hanas-e-ru.  
 Taro-Top well English-Nom/Acc speak-Pot-Pres  
 ‘Taro can speak English well.’
- b. Naomi-wa oisii koohii-**ga/o** tukur-e-ru.  
 Naomi-Top tasty coffee-Nom/Acc make-Pot-Pres  
 ‘Naomi can make good coffee.’

(2) Desiderative predicates

- a. Taro-wa omosiroi hanasi-**ga/o** kik-ita-i-soo-da.  
 Taro-Top interesting story-Nom/Acc hear-Des-Pres-SOO-Cop  
 ‘(I heard that) Taro wants to hear an interesting story.’
- b. Naomi-wa utukusii syasin-**ga/o** tor-ita-i-soo-da.  
 Naomi-Top beautiful picture-Nom/Acc take-Des-Pres-SOO-Cop  
 ‘(I heard that) Naomi wants to take a beautiful picture.’

Previous studies have examined conditions in which the nominative *ga* or the accusative *o* is preferred for object, such as lexical items of the predicates (e.g., Sugai and Naruse 2006). Among them, Shibatani (1975) observes that adjacency to the predicate affects the choice of *ga* and *o* in NAA. He describes the gradience of the acceptability with ‘\*’ and ‘?’ as given below.

- (3) a. Boku-ga susi-**ga/o** tabe-ta-i.  
 I-Nom sushi-Nom/Acc eat-Des-Pres  
 ‘I want to eat sushi.’
- b. Boku-ga susi-?**ga/o** kimi-to tabe-ta-i.  
 I-Nom sushi-Nom/Acc you-with eat-Des-Pres  
 ‘I want to eat sushi with you.’
- c. Boku-ga susi-??**ga/o** kimi-to issyoni tabe-ta-i.  
 I-Nom sushi-Nom/Acc you-with together eat-Des-Pres  
 ‘I want to eat sushi with you together.’
- d. Boku-ga susi-?\***ga/o** kimi-to issyoni susiya-de  
 I-Nom sushi-Nom/Acc you-with together sushi.restaurant-at  
 tabe-ta-i.  
 eat-Des-Pres  
 ‘I want to eat sushi with you together at a sushi restaurant.’

i) Exceptional Case Marking

Taro-wa Yuki-ga/o baka-da-to omot-tei-ru.  
 Taro-Top Yuki-Nom/Acc stupid-Cop-Pres-COMP think-Prog-Pres  
 ‘Taro thinks that Yuki is stupid.’

(Takeuchi 2010)

- e. Boku-ga susi-\***ga/o** kimi-to issyoni asoko-ni mi-e-ru  
 I-Nom sushi-Nom/Acc you-with together there-at see-Pot-Pres  
 susiya-de tabe-ta-i.  
 sushi.restaurant-at eat-Des-Pres  
 ‘I want to eat sushi with you together at a sushi restaurant we see  
 over there.’ (Shibatani 1975)

As shown in the above examples, the effect of adjacency on the acceptability of the nominative *ga* is not categorical but gradient. The acceptability of the nominative *ga* decreases as the number of intervening elements between the nominative-marked object and its predicate increases. Shibatani’s analysis was based on his self-reported intuitive judgment. As such, the next section introduces the results of an acceptability judgment task designed to test the effect of adjacency on the nominative *ga* empirically.

## 2 Acceptability Judgment Task

We conducted an acceptability judgment experiment using a five-point scale (1=very unnatural, 5=very natural) in order to verify the existence of an adjacency effect in NAA. Twenty-six native speakers of Japanese participated in the experiment. As for the adjacency conditions, the non-adjacent environment includes one intervening element: an adjunct between the object marked by *ga* or *o* and its predicate. The adjacent environment was made either by leaving out the adjunct, or by switching the word order of the adjunct and the object. The adjacency conditions (adjacent without an adjunct, adjacent with one adjunct, non-adjacent) and the case particles (*ga* and *o*) were manipulated in a  $3 \times 2$  design, yielding a total of 6 crucial conditions in the experiment. We created 2 matched lexical sets of each condition, and also varied evidential markers in the predicates using *rasii* and *sooda*. The total number of the stimuli is 36. The following are examples of the target sentences.<sup>2</sup>

- (4) a. Adjacent environment without an adjunct  
 Naoya-wa zoo-ga/o mi-ta-i-soo-da.  
 Naoya-Top elephant-Nom/Acc see-Des-Pres-SOO-Cop  
 ‘(I heard that) Naoya wants to see elephants.’
- b. Adjacent environment with an adjunct  
 Naoya-wa Indo-de zoo-ga/o mi-ta-i-soo-da.  
 Naoya-Top India-in elephant-Nom/Acc see-Des-Pres-SOO-Cop  
 ‘(I heard that) Naoya wants to see elephants in India.’

<sup>2</sup> Different from Shibatani (1975), we used *wa* instead of *ga* to mark subjects in our stimuli. This is to avoid a conceivable effect on processing by a sequence of *ga* elements (cf. Sakamoto and Yoshinaga 2006).

- c. Non-adjacent environment with one intervening element  
 Naoya-wa zoo-ga/o Indo-de mi-ta-i-soo-da.  
 Naoya-Top elephant-Nom/Acc India-in see-Des-Pres-SOO-Cop  
 ‘(I heard that) Naoya wants to see elephants in India.’

Table 1 provides the mean values and standard deviations of the acceptability scores for each condition. It is evident that the acceptability of nominative *ga* is quite low in the non-adjacent condition. This is in contrast to accusative *o*, which does not exhibit significantly lower acceptability in the non-adjacent condition.

	Adjacent w/o an adjunct	Adjacent with an adjunct	Non-adjacent
Nom <i>ga</i>	4.06 (1.27)	4.5 (0.77)	2.47 (1.25)
Acc <i>o</i>	4.66 (0.69)	4.78 (0.58)	4.31 (0.93)

TABLE 1 Mean values and standard deviations of the acceptability scores for each adjacency condition

In order to focus on the different behaviors of nominative *ga* and accusative *o* in terms of adjacency, we compare the ratings for the adjacent environment with an adjunct and the non-adjacent environment in the following analysis. In addition, we converted the ratings into z-scores for each participant in order to standardize the data and correct for a possible scale bias between participants.<sup>3</sup> Figure 1 provides the mean values of z-score ratings for each condition.

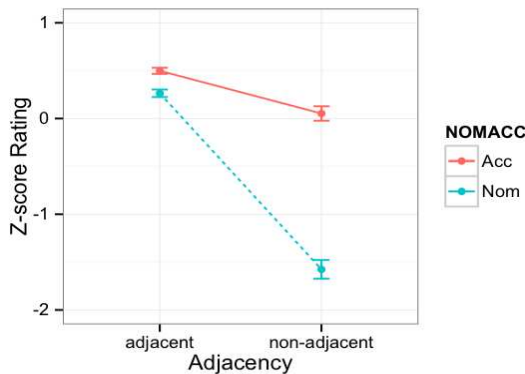


FIGURE 1 Z-score ratings for the nominative/accusative case particles in the adjacency conditions

<sup>3</sup>The z-scores were calculated based on ratings for all of the stimuli including fillers.

As expected, the acceptability of nominative *ga* in the non-adjacent condition is quite lower than in the adjacent condition, when compared with the accusative *o*.<sup>4</sup> The difference between *ga* and *o* with respect to adjacency was statistically confirmed by a linear mixed-effects model ( $t=-12.38$ ,  $p<.0001$ ).<sup>5</sup>

### 3 Perception Experiment

#### 3.1 Hypothesis

As is well known, the particle *ga* can induce focus in a broad sense on an NP that it attaches to (e.g., Kuno 1973; Heycock 1994, 2008; Vermeulen 2005). In addition, it is claimed that the preverbal position is assigned focus by default in Japanese due to its prosodic salience (Kim 1988; Ishihara 2001). This naturally leads to the assumption that the ideal position for an object with *ga* is preverbal. Since the preverbal position receives focus by default, putting the object with *ga* in the adjacent condition avoids the need to shift focus from the preverbal position. Given the effects of implicit prosody on the judgment of a written sentence (Fodor 2002), the conflict between the focal nature of *ga* and the default assignment of prosodic salience to preverbal position could explain the low acceptability observed for the object with *ga* in the non-adjacent condition. If this hypothesis is correct, assigning a plausible information structure to a sentence in which nominative *ga* occupies a non-adjacent position should significantly raise its acceptability.

#### 3.2 Stimuli

We conducted a perception experiment in order to investigate the effects of prosody on the acceptability of the nominative object and the accusative object, with respect to adjacency. The basic structure of the stimuli bearing an intervening element (hereafter, IE) and an example of the target sentences is given below.

- (5) Structure: Subject > Object > IE > Verb
- (6) Target sentences with the nominative/accusative object  
 Anna-wa ramu-ga/o dinaa-de nomi-ta-i-soo-da-yo.  
 Anna-Top rum-Nom/Acc dinner-at drink-Des-Pres-SOO-Cop-SentP  
 ‘(I heard that) Anna wants to drink rum at dinner.’

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<sup>4</sup> Although it is not significant, the acceptability of accusative *o* in the non-adjacent condition is lower than in the adjacent condition in Figure 1. This result is not surprising since the canonical word-order is ‘adjunct>accusative object’ and the order ‘accusative object>adjunct’ is produced by scrambling, which is costly in terms of processing (see Mazuka et al. 2002; Miyamoto and Takahashi 2002).

<sup>5</sup> Analyses were conducted using the *lme4* and *languageR* packages for the R statistic program.

All of the words in the target sentences contain accent in order to observe the peak of F0 on each word, following the observation that focus in Japanese expands the F0 range of the focused item while compressing the peak F0 of post-focus items (Pierrehumbert and Beckman 1988; Kubozono 1993; Sugahara 2003; Xu et al. 2010).

In order to create stimuli, a native speaker of Tokyo Japanese (female, age 26) was asked to read the target sentences in various contexts, which were recorded in a soundproof booth. The speaker read the sentences in contexts as broad focus, all-given, and narrow (contrastive) focus on either the object or the IE.

We included sentences with broad focus and all-given as fillers in our perception experiment in order to set up a control for the acceptability judgment. In order to investigate whether focus affects the acceptability of the nominative object, we used sentences with contrastive (narrow) focus as our target items, and manipulated the F0 of the object and IE in the recorded sentences. We chose recorded sentences with the nominative or accusative object in which the difference in F0 peak between the nominative/accusative object and the IE equaled roughly 100Hz. Using Praat (Boersma 2001), we raised or lowered the F0 peaks of the object and IE at 10Hz intervals in each direction. For instance, if we raised the F0 of the object by 10Hz higher in a given manipulation, we also lowered the F0 of the IE by 10Hz lower in the same step. We repeated this manipulation 5 times, as shown in Figure 2.

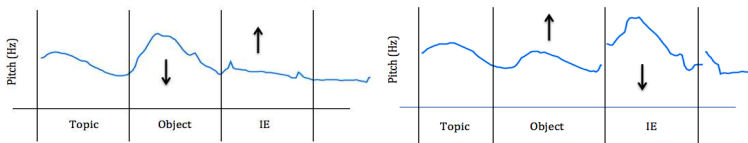


FIGURE 2 Pitch manipulation of the object/IE-focused stimuli

This manipulation produced 10 stimuli for each case particle. We set up two sessions in order to treat the stimuli with *ga* and *o* separately. Each session contained 21 fillers, including control sentences with broad focus and all-given.

When the F0 of the object is significantly higher than the following IE beyond the plausible range of downstep (Pierrehumbert and Beckman 1988; Kubozono 1989), the object is interpreted as focused and the F0 of the following IE is compressed by post-focus compression. Conversely, when the F0 of the IE is substantially higher than the preceding object, the IE is perceived as focused, thus yielding an interpretation of the object as background information. As such, we hypothesize that the acceptability of the nominative

object in non-adjacent position should increase when the F0 of the object is higher than the F0 of the IE.

### 3.3 Participants and Procedure

We conducted a rating experiment using a five-point scale (1: very unnatural; 5: very natural). The experiment included twenty-nine paid participants who are native speakers of Tokyo Japanese. The experiment was conducted in Praat. The participants listened to the stimulus sentences through headphones and were asked to rate a sentence by clicking a number from 1 to 5 on a computer screen after they heard each sentence. We eventually excluded data from seven participants, who rated non-manipulated natural stimuli low (1 or 2); thus, the total number of participants that we used for the analysis is 22 (average age: 30.7, Female: 13, Male: 9).

### 3.4 Analysis and Results

The average acceptability ratings with their standard deviations shown in Table 2 indicate that the ratings of the accusative object are generally higher than the nominative object. In fact, the ratings of the accusative *o* are always higher than the ones of the nominative *ga* in any conditions of F0.

	Accusative <i>o</i>	Nominative <i>ga</i>
Ratings	4.23 (0.22)	3.41 (0.20)

TABLE 2 Mean values and standard deviations of the acceptability ratings for each case particle

We converted the acceptability ratings of each participant in the nominative and accusative sessions independently (including fillers) to z-scores in order to correct any possible scale bias between participants. Figure 3 is a scatter plot comparing the averaged z-score ratings for sentences with nominative *ga* vs. accusative *o*. Each dot in the graph represents the averaged z-score rating of a target sentence.

Note that pre-standardized ratings of accusative *o* are always higher than those for nominative *ga*. The x-axis in Figure 3 corresponds to peak F0 values for objects with *ga/o* minus the peak F0 of the IE. As is clear from Figure 3, acceptability for nominative *ga* shows a tendency to increase as the pitch (Obj-IE) increases. Conversely, the ratings of accusative *o* tend to decrease as the pitch of Obj-IE increases.

Figure 3 contains a linear regression line for each case particle, in order to illustrate the correlation between acceptability rating and pitch pattern. The regression line for accusative *o* is  $y = -0.55 - 0.0037x$  where  $R^2$  is 0.519; and the regression line for nominative *ga* is  $y = -0.043 + 0.025x$  where  $R^2$  is 0.701.

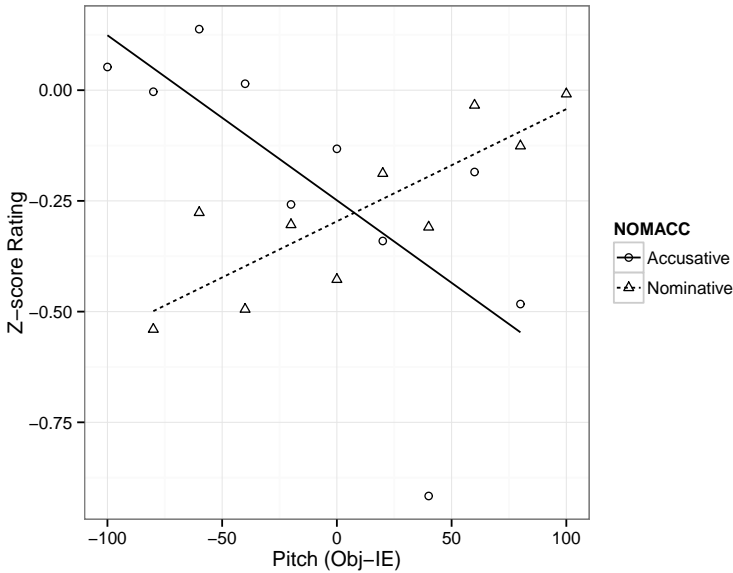


FIGURE 3 Z-score ratings of the nominative/accusative case particles in various pitches

The results of the experiment strongly support our hypothesis that the low acceptability of nominative *ga* in non-adjacent conditions is ameliorated by the right information structure through the assignment of prosodic salience.

### 3.5 Discussion

The results of our perception experiment indicate that the acceptability of accusative *o* is always rated higher than the nominative *ga*, irrespective of pitch pattern of a sentence. This finding is consistent with the results of our acceptability judgment task. However, our perceptual study showed nominative *ga* to be sensitive to pitch pattern. When the F0 of the nominative object was higher than the IE, the acceptability of the nominative object improved. To explain this, we argue that high F0 of the nominative object is interpreted as focus. This would suggest that nominative object prefers to be focused in the non-adjacent condition.

Turning now to accusative object, when the F0 of accusative object was higher than the IE, acceptability scored low. As the prosodic salience of the IE increased, so did the acceptability of accusative object. This pattern supports the notion that the preverbal position receives focus by default in Japanese. Such a default pattern in turn suggests that focus on accusative ob-



ject is avoided when there is an IE in a preverbal position.

#### 4 Conclusion

The results of our acceptability judgment experiment clearly demonstrate that, in contrast to accusative object, the acceptability of the nominative object lowers significantly when it occurs with an IE between the object and its predicate. Our subsequent perception experiment showed that the low acceptability of nominative object with an IE could be repaired by assigning prosodic features consistent with a plausible information structure. These results suggest that *ga* is associated with or induces focus on the object. Finally, our study showed that the acceptability of accusative object was rated high only in cases where a prosodically salient IE occupied the preverbal position, thus supporting the claim that the preverbal position receives default focus in Japanese (Kim 1988; Ishihara 2001).

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