

A Study of the *Bump* Alternation in Japanese from the Perspective of Extended/Onset Causation

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Abstract

This paper deals with a seldom studied object/oblique alternation phenomenon in Japanese, which we call this the *bump* alternation. This phenomenon, first discussed by Sadanobu (1990), is similar to the English *with/against* alternation. For example, compare *hit the wall with the bat* [=immobile-as-direct-object frame] to *hit the bat against the wall* [=mobile-as-direct-object frame]). However, in the Japanese version, the case frame remains constant. Although we fundamentally question Sadanobu's acceptability judgment, we also claim that the causation type (i.e., whether the event is an instance of onset or extended causation; Talmy, 1988; 2000) could make an improvement. An extended causative interpretation could improve the acceptability of the otherwise awkward immobile-as-direct-object frame. We examined this claim through a rating study, and the results showed an interaction between the Causation type (extended/onset) and the Object type (mobile/immobile) in the direction we predicted. We propose that a perspective shift on what is moving causes the "extended causation" advantage.

1 Introduction

There are many types of object/oblique alternation. A representative one is *locative* alternation:

- (1) a. Jack sprayed paint onto the wall. [mobile/theme object]
b. Jack sprayed the wall with paint. [immobile/location object] (Levin, 1993: 51)

Locative alternation is the alternation between a theme-object frame, in which the verb selects the mobile theme as the direct object, and a location-object frame, in which the verb selects the immobile location (goal) as the direct object.

The present paper deals with a much less studied alternation in Japanese, which we call the *bump* alternation. Sadanobu (1990) first studied this phenomenon under the label *tama-ate daikan* ('bullet-hit' alternation). We can regard this to be a variant of locative alternation because it is an alternation between a mobile theme and an immobile location. This is similar to what Levin (1993) called the *with/against* alternation, as illustrated below:

- (2) a. Brian hit the stick against the fence. [mobile object]
b. Brian hit the fence with the stick. [immobile object] (Levin, 1993: 67)

However, what is peculiar about the Japanese version is that the case marking remains constant, as shown in (3).

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- (3) a. *Tama-o mato-ni ateru* [mobile object]
bullet-ACC target-DAT hit
‘(lit.) hit the bullet to the target’ = ‘make the bullet hit the target’
b. *Mato-o tama-ni ateru* [immobile object]
target-ACC bullet-DAT hit
‘(lit.) hit the target to a bullet’ = ‘hit the target with a bullet’
(Sadanobu, 1990)

The English translation for (3a) is awkward, but Japanese *ateru* means ‘to cause something to hit somewhere.’ This is much more natural with a mobile/theme object, whereas the immobile/location object (3b) sounds more awkward (we will get back to this issue shortly). In this sense, *ateru* may be closer to English *bump* than *hit*, which is the reason why we tentatively call this alternation the *bump* alternation. In any case, what is peculiar here is that in (3b), the accusative-dative frame remains constant. Sadanobu (1990) claims that both frames denote the same event in which the agent causes the mobile object to move, and then bump into the immobile one. Thus, in this alternation, the case marking for the two objects is switchable without changing the interpretation. Such an alternation is crosslinguistically peculiar, and thus hard to translate directly in English. However, according to our intuition (as native speakers of Japanese), Sadanobu’s acceptability judgment of (3b) is questionable. It sounds unacceptable when interpreted in the same way as (3a). Thus, the existence of this alternation is at stake.

If this alternation were simply an erroneous observation by Sadanobu, not much would be interesting about it. However, it seems to us that this type of alternation can be more acceptable by controlling the type of the mobile object. For example:

- (4) a. *Doamiraa-o dentyuu-ni ateta/butuketa.* [mobile object]
door.mirror-ACC utility.pole-DAT hit/bumped
‘bumped the door mirror against the utility pole’
b. *Dentyuu-o doamiraa-ni ateta/butuketa.* [immobile object]
utility.pole-ACC door.mirror-DAT hit/bumped
‘bumped the utility pole with the door mirror’

In (4), *doamiraa* ‘door mirror’ is the mobile entity and *dentyuu* ‘utility pole’ is the immobile one. Sentence (4b) sounds more acceptable than (3b) even though *dentyuu* ‘utility pole’ is obviously immobile. Why is it easier for immobile *dentyuu* ‘utility pole’ in (4b) to appear as the direct object than *mato* ‘target’ in (3b)?

In order to account for the difference in acceptability judgment between (3b) and (4b), we claim that different kinds of mobile themes induce different types of causation: namely, onset and extended causations (Talmy, 1988; 2000). The former type consists of two stages, i.e., the agent’s causative action, followed by an autonomous event of the theme’s movement.

- (5) The carton slid (all the way) across the grass from a (single) gust of wind blowing on it.
(Talmy, 2000: 493)

In (5), an autonomous event (the carton’s movement) follows a causative situation (a single gust of wind blowing). This event consists of two such stages, so this is an *onset causation* event. On the other hand, the latter type, extended causation, depicts a situation where “the caused event takes place exactly during the duration of the causing event” (Talmy, 2000: 493–494).

- (6) The carton slid across the grass from the wind blowing on it (steadily).
(Talmy, 2000: 494)

The example in (6), unlike (5), depicts a situation in which the carton continues to move while the wind blows on it. Such synchronicity of the causative event and the movement of the theme are labeled *extended causation*.

In terms of the causation type, we can regard the event in (3) to be an instance of onset causation. The agent pulls the trigger of a gun, which is the causative event; after that, the bullet autonomously starts to move to the target, without help from the agent. Thus, the entire event can be construed as consisting of two stages, and thus can classify it as an instance of onset causation. By contrast, in (4), the door mirror, which is part of a car, keeps moving all the while the agent drives the car. The movement of the door mirror and the agent’s causation always coincide. Thus, we can consider the event in (4) to be an instance of extended causation.

We hypothesize that the *bump* alternation (more specifically, the immobile object variant) is more acceptable when the sentence denotes an extended causation. The reason is as follows. In the case of extended causation, the agent moves together with the mobile theme. This could trigger a perspective shift such that it makes us perceive the immobile entity as if it were a mobile one. For example, when you are driving and you approach a huge billboard, you may perceive that the billboard is coming closer even though it is not moving. The same may apply to the *bump* alternation with extended causation. In (4), even though the agent moves toward the immobile utility pole while driving a car (with door mirrors), it may be possible to perceive this situation in such a way that it is the immobile entity (the utility pole) that is moving toward the agent, eventually hitting the door mirror. The baseline assumption is that the *bump* alternation is not really an alternation; the *bump* verbs in Japanese only allow mobile objects. An apparent “alternation” is possible only when the immobile entity can appear as a mobile one. That is, it can occur only if the sentence denotes extended causation, but not when it denotes onset causation. If this hypothesis is on the right track, it follows that the immobile object frame with extended causation such as (4b) is more acceptable than the one with onset causation such as (3b). Our research question is whether there is an interaction between the Causation type (whether the event’s interpretation involves onset or extended causation) and the Object type (whether the direct object is the mobile theme or immobile entity). In particular, we would like to examine whether the difference in Causation type affects the acceptability of the immobile object frame.

2 Experiment

In order to examine the questions shown above, we conducted a questionnaire experiment through *Lancers*, a crowdsourcing service in Japan similar to Amazon Mechanical Turk. As mentioned above, the current research question is whether an interaction arises between Causation type (onset/extended) and Object type (mobile/immobile).

2.1 Methods

Materials

We prepared materials under a 2x2 factorial design. The first factor was the Causation type. We varied the mobile theme to permit interpretation of the causative event as either extended or onset causation. For example, if the mobile theme is an entity that someone is likely to throw, like a pebble or a ball, the event is likely an onset causation event. On the other hand, if the mobile theme is an entity that is likely to move along with the agent, such as a door mirror or a body part (like a shoulder or elbow), the event is interpreted as an extended causation event. The second factor was the Object type. In one situation, the accusative case *-o* marks the mobile theme, while the immobile is dative-marked with *-ni*. In another case, the immobile object is accusative-marked, with the mobile theme being dative-marked. The verbs used in this experiment were either *ateru* ‘to make hit’ or *butukeru* ‘bump.’ Some sample materials are shown below:

(7) Extended causation conditions:

- | | | | | | |
|----|--|--|---|----------------------|-------------------|
| a. | <i>Yopparai-ga</i> drunken.man-NOM | <i>ganmen-o</i> face-ACC | <i>kootuhyoosiki-ni</i> traffic.sign-DAT | <i>ateta.</i> hit | [mobile object] |
| | ‘A drunken man hit his face against the traffic sign.’ | | | | |
| b. | <i>Yopparai-ga</i> drunken.man-NOM | <i>kootuhyoosiki-o</i> traffic.sign-ACC | <i>ganmen-ni</i> face-DAT | <i>ateta.</i> hit | [immobile object] |
| | ‘A drunken man hit the traffic sign with his face.’ | | | | |

Onset causation conditions:

- c. *Yopparai-ga isitubute-o kootuuhyoosiki-ni ateta.* [mobile object]
drunken.man-NOM pebble-ACC traffic.sign-DAT hit
'A drunken man hit a pebble against the traffic sign (=made a pebble hit the sign).'
- d. *Yopparai-ga kootuuhyoosiki-o isitubute-ni ateta.* [immobile object]
drunken.man-NOM traffic.sign-ACC pebble-DAT hit
'A drunken man hit the traffic sign with a pebble.'

(8) Extended causation conditions:

- a. *Musuko-ga kata-o genkantobira-ni butuketa.*
son-NOM shoulder-ACC entrance.door-DAT bumped
'My son bumped his shoulder against the entrance door.'
- b. *Musuko-ga genkantobira-o kata-ni butuketa.*
son-NOM entrance.door-ACC shoulder-DAT bumped
'My son bumped the entrance door with his shoulder.'

Onset causation conditions:

- c. *Musuko-ga setubun-no mame-o genkantobira-ni butuketa.* [mobile object]
son-NOM setubun-GEN beans-ACC entrance.door-DAT bumped
'(lit.) My son bumped beans for the *setubun* festival to the entrance door.'
= 'My son threw beans for the *setubun* festival against the entrance door.'
- d. *Musuko-ga genkantobira-o setubun-no mame-ni butuketa.* [immobile object]
son-NOM entrance.door-ACC setubun-GEN beans-DAT bumped
'(lit.) My son bumped the entrance door with beans for the *setubun* festival.'
= 'My son hit the entrance door with beans for the *setubun* festival.'

Participants and Procedures

Participants were 105 native speakers of Japanese, recruited on-line via *Lancers*. They were asked to rate the naturalness of each sentence on a five-point Likert scale by clicking one of radio buttons numbered 1-5, with '5' corresponding to 'natural' and '1' to 'unnatural'. They were instructed to rate each item quickly following their intuitions. 54 yen was paid for each participant after the task.

The total of 16x4 sentences were evenly distributed into four lists with a Latin square design. Each list also included the same 32 fillers, among which 11 sentences were unacceptable and 21 were acceptable. The total of 48 sentences were shuffled in a fixed, pseudo-random order. Additional four lists that contained the sentences in a reverse order were prepared to counterbalance potential ordering effects. Each participant was assigned one of the eight lists. Each list was rated by 10 to 15 participants.

2.2 Predictions

Because *ateru* 'hit' and *butukeru* 'bump' both by default select a mobile theme as the direct object, we predicted there would be no significant difference in the acceptability of the mobile object conditions between the two causation types. The immobile object conditions were generally less acceptable. However, our hypothesis predicted that the possibility of interpreting the event as extended causation should improve the acceptability, compared with the onset causation conditions.

2.3 Results and Discussion

The data from one subject was excluded from the analyses because all sentences were rated 5. The grand mean of all items was 2.9. The mean rating of each condition is shown in Figure 1.

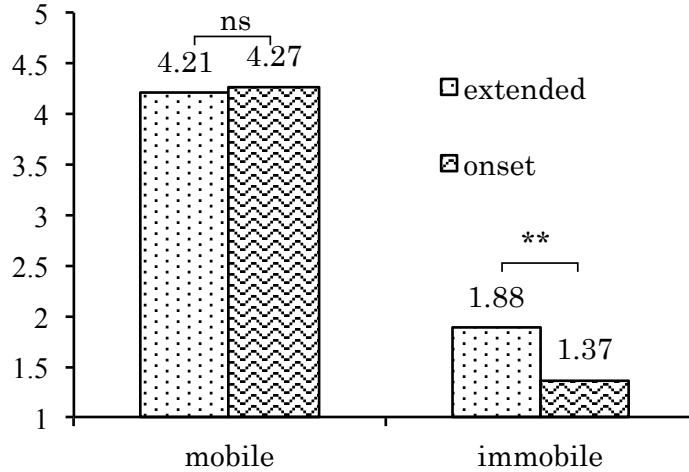


Figure 1: Mean Acceptability Ratings for Four Conditions

It is obvious from the figure that the mean ratings of the immobile object conditions were overall much lower than the means of the mobile object conditions. This fits our intuition that these *bump* verbs in Japanese select the mobile-object frame by default. A linear mixed effects model analysis conducted with maximal random effects structure (cf. Barr et al., 2013) revealed main effects of the onset type ($t=19.45$) and the causative type ($t=2.32$), as in Table 1. Most importantly, there was a significant interaction ($t=-2.70$). Planned paired comparisons revealed a highly significant main effect of the Causation type in the immobile conditions ($t=3.91$), but no significant effect in the mobile conditions ($t=-0.42$). These findings conform to our hypothesis that the extended causation may improve the acceptability of an otherwise very awkward immobile-as-direct-object frame in the *bump* alternation in Japanese. We assume that the reason for this is that the extended causation can trigger a perspective shift such that the immobile object comes across as a mobile entity.

| | Estimate | Standard Error | t value |
|----------------------|----------|----------------|-----------|
| Intercept | 2.94 | 0.06 | 50.67 |
| Object (mobile) | 1.30 | 0.06 | 19.45 |
| Causation (extended) | 0.11 | 0.04 | 2.32 |
| Object:Causation | -0.14 | 0.05 | -2.70 |

Table 1: Linear Mixed Effects Model Coefficients

| | Estimate | Standard Error | t value |
|----------------------|----------|----------------|-----------|
| Intercept | 1.63 | 0.08 | 20.92 |
| Causation (extended) | 0.26 | 0.07 | 3.91 |

Table 2: Causation Contrast in Immobile Object Conditions

| | Estimate | Standard Error | t value |
|----------------------|----------|----------------|-----------|
| Intercept | 4.24 | 0.10 | 43.18 |
| Causation (extended) | -0.03 | 0.08 | -0.42 |

Table 3: Causation Contrast in Mobile Object Conditions

3 Conclusion

The results revealed a significant interaction between Causation type and Object type in the *bump* alternation in Japanese. This extended causation makes the immobile object more acceptable compared with the case of onset causation. We interpret this result to be evidence for our hypothesis that extended causation could let us interpret the immobile object as if it were a mobile object. This occurs because the agent moves with the mobile object toward the immobile object, enabling a

perspective shift with respect to what is moving. This in turn improves the acceptability of the immobile-as-direct-object frame in the *bump* alternation, due to reinterpretation of the immobile as mobile. In other words, the immobile-as-direct-object frame comes across as the mobile-as-direct-object frame. Onset causation does not trigger such a perspective shift.

Our finding also raises questions about the validity of introspective acceptability judgments regarding various alternation phenomena reported in linguistics literature (see Bresnan et al., 2007 for a criticism in this line). For example, in our case, we found a significant improvement in the acceptability of the immobile object frame by introducing extended causation. However, the mean acceptability rate was 1.88 for the immobile object × the extended causation condition, which is very low. Thus, it is not clear if we can state that this *bump* alternation phenomenon in Japanese really exists. We may also find other cases where quantitative studies do not support the acceptability judgments reported in theoretical literature of alternation phenomena.

Another implication of this finding is that previous theoretical literature may have focused too closely on analyzing the semantics of verbs when it comes to alternation phenomena. A finer-grained analysis is desirable, especially on the effects of pragmatic interpretation induced by combining the verb and its arguments. This study demonstrated that simply changing the type of mobile theme could influence the acceptability judgment. Future research should shed more light on the contribution of nominal semantics to the interpretation of alternation phenomena.

Acknowledgments

The research reported here is partially supported by JSPS KAKENHI Grant Number 26370519. Part of this work was presented at the 32nd annual meeting of Konan English Literary Society, and we thank the audience for their comments.

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