*J. Linguistics* **56** (2020), 269–314. © Cambridge University Press 2019
doi:10.1017/S0022226719000136 First published online 21 June 2019

# The syntax of variable behavior verbs: Experimental evidence from the accusative–oblique alternations in Japanese[1]

SHIN FUKUDA

*University of Hawai'i at Mānoa*

(Received 29 September 2016; revised 28 December 2018)

Japanese has two types of two-place motion verbs whose 'objects' can be marked as either accusative or oblique (ACCUSATIVE–OBLIQUE ALTERNATIONS). The ACCUSATIVE–GOAL VERBS mark their objects with accusative case *-o* or the goal marker *-ni*, and the ACCUSATIVE–SOURCE VERBS mark their objects with accusative *-o* or the source marker *-kara*. Previous studies describe systematic differences in the interpretation of the arguments of these verbs and the events they denote between the two structures. This study argues that these alternating verbs are variable behavior verbs that are linked to two distinct syntactic structures. The core evidence for this claim comes from the results of two acceptability judgment experiments with Japanese native speakers that examined: (i) selectional restrictions on the subjects of the alternating verbs and (ii) the ability of their subjects to license 'floating' numeral quantifiers. The results of the experiments demonstrate that the accusative–source verbs alternate between the transitive and unaccusative structures, whereas the accusative–goal verbs consistently behave like transitive verbs but assign two different structural cases to their objects. Thus, the study shows that there are multiple ways in which two-place motion verbs are mapped onto distinctive syntactic structures, whereby the core meaning of the verbs and their syntactic structures together determine their interpretation.

KEYWORDS: argument realization, experimental syntax, Japanese, unaccusativity, variable behavior verbs

## 1. INTRODUCTION

Japanese has two classes of two-place verbs whose objects can be marked with either accusative case *-o* or an oblique marker. Kuno (1973: Chapter 5) notes that

[1] Many thanks to Ivano Caponigro, James Collins, Kamil Deen, Grant Goodall, Julie Jiang, Masha Polinsky, Bonnie Schwartz, Jon Sprouse, and members of the audience at the EALL talk at University of Hawai'i at Mānoa in Fall 2018, for helpful comments and discussions. I am also grateful to three anonymous *Journal of Linguistics* referees and Kersti Börjars, the editor of *Journal of Linguistics*, for their helpful comments and suggestions that significantly imporved this paper. Special thanks are due to Yuki Hirose, who kindly allowed me to run the experiments whose results are reported in this study with her students. All remaining errors are of course my own.

a group of verbs of inherently directed motion in Japanese allow their object to be marked with either accusative *-o* or the goal marker *-ni*.

(1) (a) Taroo-ga **yama-o/ni** nobot-ta
T-NOM mountain-ACC/GOAL climb-PST
'Taroo climbed up the mountain.'
(b) Keiko-ga **kawa-o/ni** kudat-ta
K-NOM river-ACC/GOAL descend-PST
'Keiko went down the river/to the river.'

Other verbs such as *ik-u* 'go', *kaer-u* 'return', *agar-u* 'rise', *sagar-u* 'come down', *nagare-ru* 'flow', and *sawar-u* 'touch' also participate in the alternation with various degrees of productivity. These verbs are called ACCUSATIVE–GOAL VERBS in this study.

Independently of Kuno (1973), Teramura (1982: 106–108) discusses another group of verbs of inherently directed motion in Japanese that mark their object with either accusative case *-o* or the source marker *-kara* 'from'.[2]

(2) (a) Taroo-ga **ie-o/kara** de-ta
T-NOM home-ACC/SOURCE come.out-PST
'Taroo left/left from his home.'
(b) Taroo-ga **kokyoo-o/kara** hanare-ta
T-NOM hometown-ACC/SOURCE separate-PST
'Taroo left/left from his hometown.'

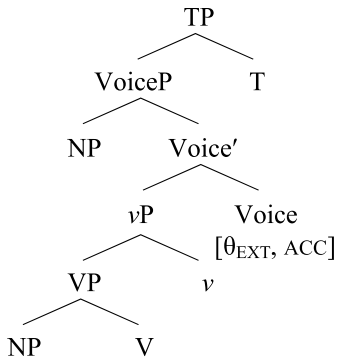
In addition to the two verbs in (2), *hazure-ru* 'come off', *nuke-ru* 'remove', *sar-u* 'leave', and *shirizok-u* 'resign' also participate in the alternations. These verbs are called ACCUSATIVE–SOURCE VERBS in this study. Let us call these two classes of verbs together ACCUSATIVE–OBLIQUE ALTERNATION VERBS, and the phenomenon ACCUSATIVE–OBLIQUE ALTERNATIONS. Previous studies have shown that the arguments of the accusative–oblique alternation verbs as well as the events they denote are interpreted differently depending on whether their objects are accusative-marked (the ACCUSATIVE STRUCTURE) or oblique-marked (the OBLIQUE STRUCTURE) (Kuno 1973, Sugamoto 1982, Teramura 1982). To the best of our knowledge, no formal analysis has been proposed to account for this behavior of these verbs.

This study presents the results of two sentence acceptability judgment experiments that examined phenomena in which the arguments of the accusative–oblique alternation verbs exhibit contrastive behaviors: (i) selectional restrictions on subjects and (ii) the ability of subjects to license 'floating' numeral quantifiers

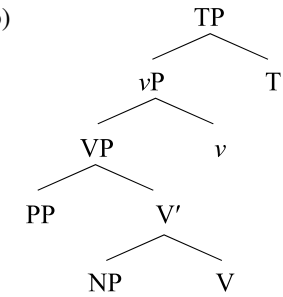
[2] All the two-place Japanese verbs that exhibit the object marking alternation appear to be verbs of inherently directed motion, and not manner of motion verbs. I would like to thank an anonymous referee for pointing this out to us.

(FNQs). The results of these experiments show that (i) subjects of the accusative–source verbs impose selectional restrictions on their subjects only when they are in the accusative structure, and (ii) subjects of the same verbs readily license VP-internal FNQs only when they are in the oblique structure. I argue that these behaviors can be accounted for if the accusative–source verbs are analyzed as being mapped onto the transitive structure when their object is accusative-marked (3a), and onto the unaccusative structure when their object is oblique-marked (3b).

(3) (a)

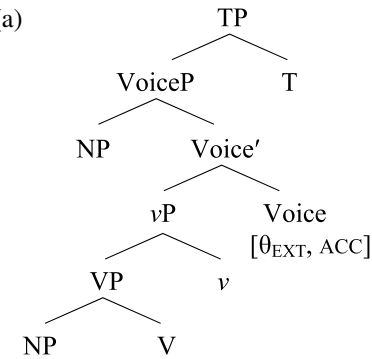



(b)

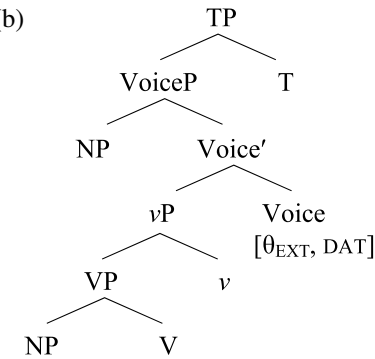



The same experiments also show that the interaction between selectional restrictions on subjects and the object marking is observed with only one accusative–goal verb, and none of the accusative–goal verbs shows a correlation between the object marking and subjects' ability to license FNQs. These findings lead us to argue that the accusative–goal verbs have two different transitive structures, one with accusative case (4a) and the other with dative case (4b).

(4) (a)




(b)




Therefore, according to the analyses of the accusative–oblique alternation verbs proposed in this study, the two classes of accusative–oblique alternation verbs are mapped onto two distinct sets of underlying structures, and those distinctive syntactic structures and the core meaning of the alternating verbs together determine the interpretation of their arguments and the events that these verbs denote. As such, the proposed analysis provides novel arguments for approaches



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

to the lexical semantics–syntax interface according to which the meaning of verbs and their syntactic structures co-construct the interpretation of verbs' arguments and the events they denote (e.g. Perlmutter 1978; Hale & Keyser 1986, 1992, 1993, 2002; Miyagawa 1989a, b; Hoekstra & Mulder 1990; Tsujimura 1990a, b, 1994, 1996; Hoekstra 1992; Levin & Rappaport-Hovav 1995; Rappaport-Hovav & Levin 1998; Ritter & Rosen 1998; Sorace 2000; McIntyre 2004; Folli & Ramchand 2005; Ramchand 2008).

This paper is organized as follows. Section 2 introduces key observations concerning the two classes of accusative–oblique alternation verbs, some from previous studies and some original. These observations suggest that there is a systematic relationship between the two different object markings and the interpretation of the arguments of the alternating verbs and the events they denote. Section 3 introduces an initial hypothesis for the accusative–oblique alternation verbs, according to which they are mapped onto the transitive structure and the unaccusative structure depending on the object marking (the TRANSITIVE–UNACCUSATIVE ALTERNATION HYPOTHESIS). Sections 4 and 5 present the results of the two sentence acceptability judgment experiments that examined phenomena in which the arguments of the alternating verbs exhibit contrastive behaviors: (i) selectional restrictions on subjects (Section 4) and (ii) the ability of subjects to license FNQs (Section 5). Section 6 discusses implications of the results of Experiments 1 and 2 for the analysis of the two classes of accusative–oblique alternation verbs. The findings from Experiments 1 and 2 support the transitive–unaccusative alternation hypothesis as the right analysis for the accusative–source verbs, but not for the accusative–goal verbs. Given the conclusions in Section 6, Section 7 presents an alternative analysis for the accusative–goal verbs, according to which they are always transitive. Section 8 examines implications of the proposed analyses of the accusative–oblique alternations for the larger picture of the morpho-syntactic organization of Japanese verbs. In particular, it explores the relationship between the accusative–oblique alternations and a better-known verbal alternation in Japanese, the CAUSATIVE ALTERNATION, and shows that the relationship between morphology and syntax is transparent with some verbs, as with the accusative–source verbs, but not with others, as with the accusative–goal verbs. Section 9 concludes the paper.

## 2. INTRODUCING ACCUSATIVE–OBLIQUE ALTERNATIONS

This section introduces empirical observations from previous studies and some original observations about the accusative–goal verbs and the accusative–source verbs, and identifies a set of contrastive morpho-syntactic, lexical-semantic, and aspectual properties of the alternating verbs to be accounted for.



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

### 2.1 *The interpretation of objects*

Kuno (1973) argues that the object of an accusative–goal verb is interpreted differently with the two different object markings: as a PATH in the accusative structure and as a GOAL in the oblique structure. In the accusative structure, the motion designated by the alternating verbs is interpreted as covering the entire dimension of the referent of the object (path), while in the oblique structure the referent of the object is the destination (goal) of the motion designated by these verbs. Thus, the accusative structure is infelicitous in (5a) when 'a helicopter' is the means to get to the top of a mountain, because the motion of ascending does not cover the whole mountain. In contrast, both structures in (5) are felicitous with 'a Jeep' as the means of ascending, because, in addition to the mountain being compatible with a goal, the motion of ascending can be interpreted as covering the whole mountain.

(5) (a) Herikoputaa-de **yama-#o/ni** nobot-ta
helicopter-INST mountain-#ACC/GOAL climb-PST
'(I) climbed to the top of the mountain by helicopter.'
(b) Jiipu-de **yama-o/ni** nobot-ta
jeep-INST mountain-ACC/GOAL climb-PST
'(I) climbed the mountain by a Jeep.'

(Kuno 1973: 98–99 exx. (11) & (12))

Furthermore, when the referent of the object is a natural path but an unlikely goal, e.g. *kaidan* 'stairs', it is compatible only with the accusative structure (6a). In contrast, when the referent of the object is a natural goal but an unlikely path, e.g. *choojoo* 'summit', it is compatible only with the oblique structure (6b).

(6) (a) Kodomo-ga **kaidan-o/#ni** ippo_ippo nobot-ta
child-NOM stairs-ACC/#GOAL step.by.step climb-PST
'The child climbed up the stairs step by step.'
(b) Kodomo-ga **yama-no** **choojoo-ni/#o** nobot-ta
child-NOM mountain-GEN summit-GOAL/#ACC climb-PST
'The child climbed to the top of the mountain.'

With the accusative–source verbs, the difference in interpretation of objects between the two structures seems subtle. However, the following naturally attested examples in (7) suggest that some NPs are compatible with being the object of the accusative–source verbs only in the accusative structure (7a) or only in the oblique structure (7b).

(7) (a) Hannin-ga **hitojichi-kara/#o** hanare-ta-no-o kakunin...
(http://homepage2.nifty.com/)
suspect-NOM hostage-SOURCE/ACC separate-PST-NML-ACC confirm
'Confirming that the suspect moved away from the hostage...'



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(b) Ochiai-ga **Kyojin-o/#kara** hanare-ta toki-no yooni...
(http://detail.chiebukuro.yahoo.co.jp/)
O-NOM Giants-ACC/SOURCE separate-PST time-NMNL like
'Just like when Ochiai left the Giants...'

The difference between accusative-marked and oblique-marked objects with accusative–source verbs appears to be that the accusative object is interpreted as a location where the subject engages in some activity prior to moving away from it, while the oblique object simply refers to a location from which the subject moves away. Thus, (7a) with the oblique object is felicitous as the sentence denotes an event in which the suspect simply moved away from the hostage, yet the accusative marking of the same object is infelicitous presumably because an accusative-marking of *hitojichi* 'hostage' gives rise to the interpretation that it is a location of a prior activity, and such an interpretation is pragmatically odd. The situation is the opposite with (7b). (7b) with the accusative-marked object is felicitous because the object refers to a professional baseball team, which is interpreted as a location where the subject engaged in some activity, i.e. playing baseball professionally, prior to leaving it. The oblique marking of the same object is infelicitous because it would force an interpretation in which the subject left the professional team as a location, which is pragmatically implausible. Thus, while the object of the accusative–source verbs is always interpreted as a location from which subjects move away, the accusative-marked object seems to implicate the existence of a prior activity before the moving-away event that these verbs denote.

### 2.2 *The interpretation of subjects*

Unlike Kuno (1973), who focuses on the interpretation of the objects of accusative–goal verbs, Teramura (1982: 107) pays attention to the interpretation of the subjects of the accusative–source verbs. He notes that the accusative–source verbs can felicitously have inanimate subjects only when they are in the oblique structure.

(8) (a) Midoriiro-no ekitai-ga **kizuguchi-kara/#o** de-ta
green.color-GEN liquid-NOM wound-SOURCE/#ACC come.out-PST
'Green liquid came out of the wound.'
(b) Kurippu-ga **beruto-kara/#o** hazure-ta
clip-NOM belt-SOURCE/#ACC come.off-PST
'The clip came off from the belt.'

Initial evidence suggests that at least one of the accusative–goal verbs, *sawar-u* 'touch', also imposes selectional restrictions on its subjects depending on the object marking. The examples in (9) show that *sawar-u* 'touch' is compatible with an inanimate subject only when it is in the oblique structure.



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(9) (a) **Keiko-ga** yuka-o/ni sawat-ta
K-NOM floor-ACC/GOAL touch-PST
'Keiko touched the floor.'

(b) **Keiko-no sukaato-ga** yuka-ni/#o sawat-ta
K-GEN skirt-NOM floor-GOAL/#ACC touch-PST
'Keiko's skirt touched the floor.'

Thus, there is initial evidence that the accusative–oblique alternation verbs impose different selectional restrictions on their subjects depending on the object marking. In particular, at least some of the alternating verbs seem to require animate subjects when they are in the accusative structure.

### 2.3 *Event types*

Sugamoto (1982) argues that the accusative–goal verbs denote different types of events with the two different object markings. While an accusative–goal verb in the accusative structure is compatible with an aspectual verb that indicates completion of events, such as *-kir-u* 'finish' (10a), Sugamoto notes that the same verbs in the oblique structure are infelicitous with the same aspectual verb (10b).

(10) (a) Kodomo-ga yama-**o** nobori-kit-ta
child-NOM mountain-ACC climb-complete-PST
'The child finished climbing up the mountain.'

(b) #Kodomo-ga yama-**ni** nobori-kit-ta
child-NOM mountain-GOAL climb-complete-PST
('The child finished climbing up the mountain.')

This contrast suggests that the accusative–goal verbs denote durative events, i.e. activity or accomplishment, when they are in the accusative structure, whereas the same verbs denote punctual events, i.e. achievement, when they are in the oblique structure. The contrast is further motivated by these verbs' compatibility with durative adverbials (as in *for two hours*) and time-span adverbials (as in *in two hours*) (e.g. Dowty 1979) when they are in the two different structures. Compare the following two examples:

(11) (a) Kodomo-ga yama-o **ni-jikan-de/ni-jikan**
child-NOM mountain-ACC two-hour-in/two-hour
nobot-ta
climb-PST
'The child climbed the mountain in two hours/for two hours.'

(b) Kodomo-ga yama-ni **ni-jikan-de/#ni-jikan**
child-NOM mountain-GOAL two-hour-in/two-hour
nobot-ta
climb-PST
'The child was on top of the mountain in two hours/#for two hours.'



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(11a) shows that the accusative–goal verb *nobor-u* 'climb' in the accusative structure is compatible with both a durative adverbial *ni-jikan* 'for two hours' and a time-span adverbial *ni-jikan-de* 'in two hours', with the adverbials modifying the event of the child climbing up the mountain. While the durative adverbial induces the activity reading of (11a), the time-span adverbial favors the accomplishment reading of the same sentence. In contrast, the same verb in the oblique structure is only compatible with the time-span adverbial.[3] This contrast is expected if the accusative–goal verbs denote durative events when they are in the accusative structure but punctual events when they are in the oblique structure.

Unlike the accusative–goal verbs, the accusative–source verbs appear to always denote punctual events. Thus, accusative–source verbs such as *de-ru* 'come out' are compatible only with a time-span adverbial such as *go-fun-de* 'in five minutes' and incompatible with a durative adverbial like *go-fun* 'for five minutes' regardless of the object marking.

(12) (a) Kodomo-ga furo-o **go-fun-de/#go-fun**
child-NOM bath-ACC five-minute-in/five-minute
de-ta
come.out-PST
'The child came out of the bath in two minutes/#for two minutes.'

(b) Kodomo-ga furo-kara **go-fun-de/#go-fun**
child-NOM bath-SOURCE five-minute-in/five-minute
de-ta
come.out-PST
'The child came out from the bath in two minutes/#for two minutes.'

### 2.4 *Section summary*

The observations from previous studies and our own original observations together show that the accusative–oblique alternation verbs in the two different structures exhibit the following similarities and differences in the interpretation of their arguments and the type of events they denote.

To the best of our knowledge, no formal account of these similarities and differences has been proposed.

[3] The durative adverb is felicitous in (11b) with an irrelevant interpretation, in which the adverb refers to the time during which the child was on top of the mountain (i.e. the child was on top of the mountain for two hours).



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

| Characteristics | Object marking | Interpretation of objects | Interpretation of subjects | Event type |
|---|---|---|---|---|
| Acc–goal verbs | *-o* | Path | Must be animate? | Durative |
| | *-ni* | Goal | Can be inanimate | Punctual |
| Acc–source verbs | *-o* | Location (of a prior activity) | Must be animate? | Punctual |
| | *-kara* | location | Can be inanimate | Punctual |

*Table 1*
Interpretations of arguments and events with accusative–goal and accusative–source alternation verbs.

## 3. INTRODUCING A TRANSITIVE–UNACCUSATIVE ALTERNATION HYPOTHESIS

The correlation between selectional restrictions on subjects and the presence of an accusative-marked object observed with some of the accusative–oblique alternation verbs discussed in Section 2 is reminiscent of Burzio's generalization, a well-known generalization about the correlation between the presence of an external argument and that of structural accusative case.

(13) *Burzio's generalization* (Burzio 1986: 178)
All and only the verbs that can assign a theta-role to the subject can assign accusative case to an object.

Burzio's generalization was motivated by the contrastive behaviors exhibited by passivized transitive verbs and unaccusative verbs on the one hand, and active transitive verbs and unergative verbs on the other. Passivized transitive verbs and unaccusative verbs lack both an external argument theta-role and structural case. As such, they have an internal argument that becomes a (derived) subject. As an internal argument, the derived subject of passivized transitive verbs and unaccusative verbs receives a thematic role that is compatible with animate and inanimate referents, such as PATIENT and UNDERGOER. In contrast, active transitive verbs and unergative verbs have both an external argument theta-role, typically AGENT, and structural case. Thus, their subjects are subject to selectional restrictions, and they can license an accusative NP.

Now, if the accusative–oblique alternation verbs in the accusative structure are transitive verbs while the same verbs in the oblique structure are unaccusative verbs, the presence of selectional restrictions on subjects only with the alternation verbs in the accusative structure receives a straightforward account. Let us call this hypothesis the TRANSITIVE–UNACCUSATIVE ALTERNATION HYPOTHESIS:



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

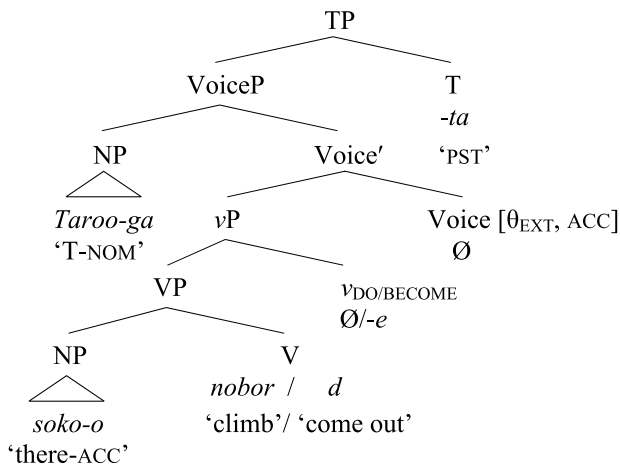
(14) The accusative–oblique alternation verbs in Japanese are transitive verbs with an external argument subject when they are in the accusative structure, and unaccusative intransitive verbs with an internal argument subject when they are in the oblique structure.

In the Minimalist Program framework (Chomsky 1995), the standard way to account for the link between the selection of an external argument subject and the presence of accusative case is to assume the presence of a semi-functional verbal head Voice, which licenses an external argument and structural case (Kratzer 1994, 1996). Here, I adopt the recent hypothesis that a Voice head embeds another level of a semi-functional verbal projection, *v* (little *v*) (e.g. Pylkkänen 2002; Cuervo 2003; Collins 2005; Alexiadou, Anagnostopoulou & Schäfer 2006; Harly 2009, 2013; Legate 2012, 2014), whose sole function is to encode event types by introducing abstract predicates such as *DO*, *CAUSE*, and *BECOME* (Harley 1995, 2008; Folli & Harley 2005, 2007).

Under this analysis, a sentence with an alternating verb in the accusative structure, like (15a), has the structure in (15b).

(15) (a) Taroo-ga **soko-o** nobot/de-ta
T-NOM **there-ACC** climb/come.out-PST
'Taroo climbed/came out of there.'

(b)




In (15b), the subject is the specifier of a VoiceP, where an external argument is base-generated and thematically licensed with an AGENT theta-role by the Voice head, and the Voice head also provides accusative case to the NP inside VP. I assume that the active Voice head in Japanese is always phonologically null. The *v* head, on the other hand, is phonologically null with *nobor*-Ø-*u* 'climb'



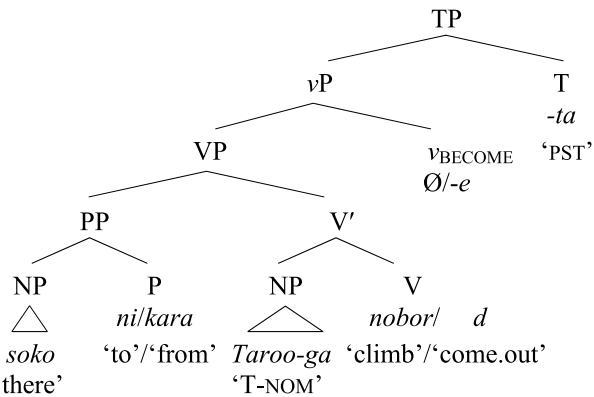
https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

but is overtly realized as *-e-* with *d-e-ru* 'come out' (e.g. Harley 2008).[4] The *v* head introduces the abstract predicate *DO* ($v_{DO}$) with *nobor-Ø-u* 'climb', as it denotes a durative event, while the same *v* head introduces the abstract predicate *BECOME* ($v_{BECOME}$) with *d-e-ru* 'come out', realizing the punctual interpretation of the sentence.[5] The accusative-marked object *soko* 'there' is interpreted as a path with *nobor-Ø-u* 'climb' and a location of some activity with *d-e-ru* 'come out', because of the lexical semantics of these verbs and the abstract predicates $v_{DO}$ and $v_{BECOME}$. The verb *nobor-Ø-u* 'climb' and $v_{DO}$ together denote a durative event, with which the accusative object denotes the path that the subject moves along. With the verb *d-e-ru* 'come out' and $v_{BECOME}$, the accusative-marked object is interpreted as a location of some activity from which the subject moves away.

When the same verbs are in the oblique structure, they are unaccusatives. Thus, a sentence with an alternating verb in the oblique structure, like (16a), has the underlying structure in (16b).

(16) (a) Taroo-ga **soko-ni/kara** nobor/de-ta
T-NOM there-GOAL/SOURCE climb/come.out-PST
'Taroo climbed to/came out from there.'

(b)




Since they are unaccusatives, the alternating verbs in the oblique structure lack the projection of Voice and therefore have no external argument or accusative case. They are embedded under a *v* that encodes the abstract predicate *BECOME*

[4] The verb *d-e-ru* 'come out' is analyzed as morphologically complex because of the existence of the causative counterpart *d-as-u* 'take out', which shares the same root. Verbs like *nobor-u* 'ascend' have no such form. See Section 8 for a discussion of the causative alternation.

[5] Here, $v_{BECOME}$ is intended to capture telic events with no duration, i.e. achievements. However, as an anonymous referee pointed out, there are also accomplishments, which are durative and telic, and degree achievements, which are compatible with both telic and atelic interpretations (Dowty 1979). I assume that accomplishments derive from the durative (activity) interpretation provided by $v_{DO}$ in combination with an element that delimits the event (e.g. Borer 1994, 2005; Tenny 1994; Ritter & Rosen 1998; Ramchand 2008, Fukuda 2012, among many others), while degree achievements involve $v_{BECOME}$ but can be interpreted as atelic with certain arguments (e.g. Hay, Kennedy & Levin1999).



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

($v_{\text{BECOME}}$), which is null with *nobor-Ø-u* 'climb' but is overtly realized as *-e-* with *d-e-ru* 'come out' in (16b). This accounts for the punctual interpretation of the event that (16a) denotes. The verbs themselves in turn take the 'object' licensed by an oblique marker *-ni* or *-kara*, which I tentatively assume to be postpositions, as their PP specifier, and the subject as their internal argument. The latter is fronted to the sentence-initial position in (16a).[6]

While the proposed transitive–unaccusative alternation analysis of the accusative–oblique alternation in (15) and (16) accounts for the properties of the alternation verbs discussed in Section 2, it paints a considerably complicated relationship between the alternating verbs and their underlying structures, where the alternating verbs are linked to two fundamentally different structures. As such, the hypothesis requires further empirical support. In what follows, I present the results of two acceptability judgment experiments that examined (i) selectional restrictions on subjects of the alternating verbs in the two different structures and (ii) the ability of subjects of the alternating verbs to license 'floating' numeral classifier phrases in the two different structures. The results of these experiments provide strong support for the transitive–unaccusative alternation analysis of the accusative–source verbs, while they suggest that the same analysis is not the right analysis for the accusative–goal verbs.

## 4. Selectional restrictions on subjects

One of the original motivations for the transitive–unaccusative alternation analysis of the accusative–oblique alternation comes from the observation that some of the alternating verbs appear to impose different selectional restrictions on subjects when they are in the two different structures. If the transitive–unaccusative alternation analysis of the accusative–oblique alternations is on the right track, it predicts a systematic correlation between the structure, the accusative vs. the oblique, and selectional restrictions on their subjects. When these verbs are in the accusative structure, referents that are incompatible with being an external argument, such as inanimate objects, should be disfavored compared to referents that are typical external arguments, such as human beings, due to the hypothesized presence of an external argument theta role. In contrast, no such preference is predicted when the same verbs are in the oblique structure and therefore unaccusatives. Experiment 1 tests these predictions.

[6] I assume that an unaccusative subject may stay in-situ in Japanese (Nakayama & Koizumi 1991, Yatsushiro 1999, Miyagawa & Babyonyshev 2004) if its co-argument (i.e. a locative argument) moves to [Spec, TP] (Takano 2008, 2011).



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

## 4.1 *Experiment 1: Animacy of subjects and object marking*

### 4.1.1 *Experimental design and predictions*

Although external arguments cannot be reduced to their animacy or volitionality (e.g. vanValin & Wilkins 1996, Folli & Harley 2008, Ramchand 2008), human referents are prototypical external arguments while inanimate objects that are construed as incapable of self-propelled movement typically cannot be external arguments. As such, the animacy of subjects would most clearly bring about the hypothesized difference in selectional restrictions on subjects imposed by the alternating verbs with the two different object markings. Therefore, the experimental sentences in Experiment 1 involved either a human subject or an inanimate object subject whose referent is construed as incapable of self-propelled movement.

A caveat about Experiment 1 is in order here. It is important to point out that the difference in acceptability of the alternating verbs in the two structures with animate (i.e. human) and inanimate subjects is expected to be a matter of degree, rather than a categorical difference. Across languages, animate subjects are preferred over inanimate subjects, especially with two-place verbs (e.g. de Swart, Lamers & Lestrade 2008; see Kuno 1973 for a discussion of preference for animate subjects in Japanese). Thus, sentences with the alternating verbs with animate subjects are expected to be judged as more acceptable than their counterparts with inanimate subjects regardless of the object marking. However, what the transitive–unaccusative alternation analysis predicts is that the difference in acceptability between sentences with the alternating verbs with animate subjects and those with inanimate subjects would be greater with the accusative structure than with the oblique structure. Hence, what needs to be examined is whether there is an interaction between animacy of subjects and object markings in acceptability judgments of sentences with the alternating verbs.

### 4.1.2 *Materials*

Experiment 1 had a 2 × 2 design with STRUCTURE (accusative vs. goal/source) and ANIMACY (animate vs. inanimate). Four accusative–goal verbs (*nobor-u* 'climb', *kudar-u* 'descend', *agar-u* 'rise', and *sawar-u* 'touch') and four accusative–source verbs (*hazure-ru* 'come off', *de-ru* 'come out', *nuke-ru* 'remove', and *hanare-ru* 'separate') were used to create the experimental sentences. Four lexicalizations of each verb were constructed for each of the four conditions ($8 \times 4 \times 4 = 128$) and distributed among four lists using a Latin Square design. Each list of 32 sentences was mixed with 38 filler sentences with various degrees of acceptability. Thus, each participant rated 70 sentences. The order of sentences in each list was pseudo-randomized, so that no two experimental sentences were presented in sequence. Examples of experimental sentences in the four conditions are provided in (17). The complete set of the experimental



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

and filler sentences for Experiment 1 is available online, via https://www.cambridge.org/core/journals/journal-of-linguistics, in the Supplementary Materials file alongside the present article.

(17) (a) *Oblique structure: [animate]*
Hoteru-no juugyooin-wa kimono-o ki-ta [hanayome]-ga
hotel-GEN employee-TOP kimono-ACC wear-PST bride-NOM
uedingukeeki-**ni** sawat-ta to dooryoo-ni it-ta
wedding.cake-GOAL touch-PST COMP colleague-to say-PST
'The employee of the hotel told his colleague that the bride who wore kimono touched the wedding cake.'

(b) *Oblique structure: [inanimate]*
Hoteru-no juugyooin-wa hanayome-no kimono-no [obi]-ga
hotel-GEN employee-TOP bride-GEN kimono-GEN sash-NOM
uedingukeeki-**ni** sawat-ta to dooryoo-ni it-ta
wedding.cake-GOAL touch-PST COMP colleague-to say-PST
'The employee of the hotel told his colleague that the bride's kimono's sash touched the wedding cake.'

(c) *Accusative structure: [animate]*
Hoteru-no juugyooin-wa kimono-o ki-ta [hanayome]-ga
hotel-GEN employee-TOP kimono-ACC wear-PST bride-NOM
uedingukeeki-**o** sawat-ta to dooryoo-ni it-ta
wedding.cake-ACC touch-PST COMP colleague-to say-PST
'The employee of the hotel told his colleague that the bride who wore kimono touched the wedding cake.'

(d) *Accusative structure: [inanimate]*
Hoteru-no juugyooin-wa hanayome-no kimono-no [obi]-ga
hotel-GEN employee-TOP bride-GEN kimono-GEN sash-NOM
uedingukeeki-**o** sawat-ta to dooryoo-ni it-ta
wedding.cake-ACC touch-PST COMP colleague-to say-PST
'The employee of the hotel told his colleague that the bride's kimono's sash touched the wedding cake.'

#### 4.1.3 *Procedure and participants*

Forty-five university students in Tokyo, Japan, participated in the experiment. The experiment was administered both in a university classroom using a paper-and-pencil format and online through a website designed to host psycholinguistic experiments (http://spellout.net/ibexfarm/). The participants were instructed to use a seven-point scale to judge the sentences, with 1 representing 'unnatural' and 7, 'natural'. The data from two participants were removed before analysis because they failed to complete the task as instructed. The raw judgments collected from each participant were standardized ($z$-score transformed) to correct for



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

possible scale biases among the participants (Cowart 1997, Schütze & Sprouse 2013). The data from the accusative–goal verbs and the accusative–source verbs were analyzed separately, because the results of a pilot study indicated that the alternation type is a significant factor. The data were analyzed using linear mixed-effects models with VERB, STRUCTURE, and ANIMACY as fixed factors, and participants and items as random factors. These analyses were performed using the lmerTest package (Kuznetsova et al. 2016) in the statistical software R (R Core Team 2015).

#### 4.1.4 *Results*

##### 4.1.4.1 *The accusative–goal alternation verbs*

The results of the statistical analysis show that both ANIMACY and STRUCTURE are significant predictors of the acceptability judgments of the experimental sentences (ANIMACY: $\beta = -0.50$, SE = 0.22, $p = .03$; STRUCTURE: $\beta = 0.43$, SE = 0.22, $p = .05$). However, the interaction between STRUCTURE and ANIMACY is not significant ($\beta = 0.11$, SE = 0.31, $p = .72$). In addition, the mean acceptability judgments with two of the verbs turn out to be significantly different (*kudar-u* 'descend': $\beta = -0.60$, SE = 0.22, $p < .01$; *agar-u* 'rise': $\beta = -0.49$, SE = 0.22, $p = .03$). Since some of the verbs are significant predictors, the results were analyzed for the four individual verbs.

Figure 1 summarizes the mean *z*-scores and raw scores for the acceptability judgments for the sentences with the four accusative–goal verbs in the four conditions. The error bars in Figure 1 and all the following figures represent standard errors. A visual inspection of Figure 1 suggests that there is an interaction between ANIMACY and STRUCTURE with *sawar-u* 'touch', as there is a large difference between the two means within the inanimate condition while the two means within the animate condition overlap. With the other three verbs, the same two factors do not seem to interact with each other. The statistical analysis confirms the above observations. With *sawar-u* 'touch', the interaction between ANIMACY and STRUCTURE is significant ($\beta = 0.71$, SE = 0.27, $p = .02$). ANIMACY is also a significant predictor ($\beta = -0.64$, SE = 0.19, $p < .01$), while STRUCTURE is not ($\beta = 0.01$, SE = 0.19, $p = .98$). With the other three verbs, the interaction between ANIMACY and STRUCTURE is not significant (*nobor-u* 'climb': $\beta = 0.11$, SE = 0.29, $p = .71$; *kudar-u* 'descend': $\beta = -0.31$, SE = 0.42, $p = .47$; *agar-u* 'rise': $\beta = 0.40$, SE = 0.23, $p = .10$). With *agar-u* 'rise' and *nobor-u* 'climb', both ANIMACY (*agar-u* 'rise': $\beta = -0.66$, SE = 0.17, $p < .01$; *nobor-u* 'climb': $\beta = -0.49$, SE = 0.20, $p = .03$) and STRUCTURE (*agar-u* 'rise': $\beta = 0.44$, SE = 0.17, $p < .01$; *nobor-u* 'climb': $\beta = 0.43$, SE = 0.20, $p < .05$) are significant predictors. With *kudar-u* 'descend', neither of the factors is significant (STRUCTURE: $\beta = 0.20$, SE = 0.30, $p = .52$; ANIMACY: $\beta = -0.21$, SE = 0.30, $p = .50$).



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

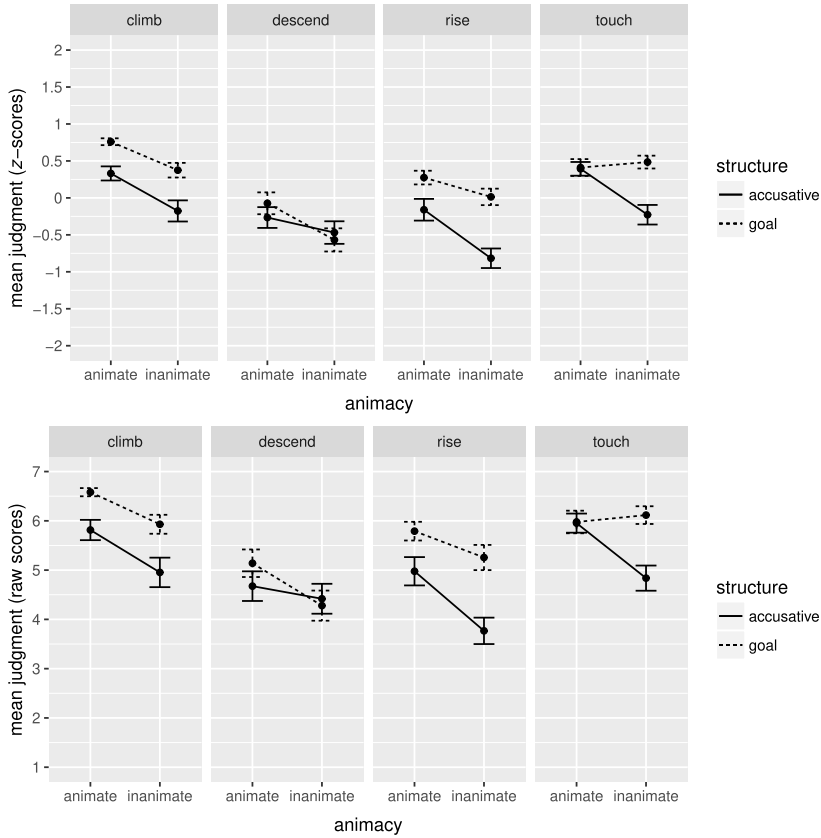



*Figure 1*
Interaction plots for STRUCTURE and ANIMACY with the four accusative–goal verbs.

#### 4.1.4.2 *The accusative–source alternation verbs*

With the four accusative–source verbs as a group, ANIMACY is a significant predictor (β = –0.57, SE = 0.18, $p < .01$) but STRUCTURE is not significant (β = –0.05, SE = 0.18, $p = .80$). Importantly, unlike the results with the accusative–goal verbs, the interaction between STRUCTURE and ANIMACY is significant (β = 0.60, SE = 0.26, $p = .02$). None of the individual verbs is a significant predictor.

Figure 2 summarizes the mean *z*-scores and raw scores for the acceptability judgments for the sentences with the four accusative–source verbs in the four conditions. A visual inspection of Figure 2 suggests that there is an interaction between ANIMACY and STRUCTURE with all four verbs, as there is a large difference between the two means within the inanimate condition while the two means within the animate condition either overlap or are very close to each other. The statistical analysis largely confirms the above observations. With three of the



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

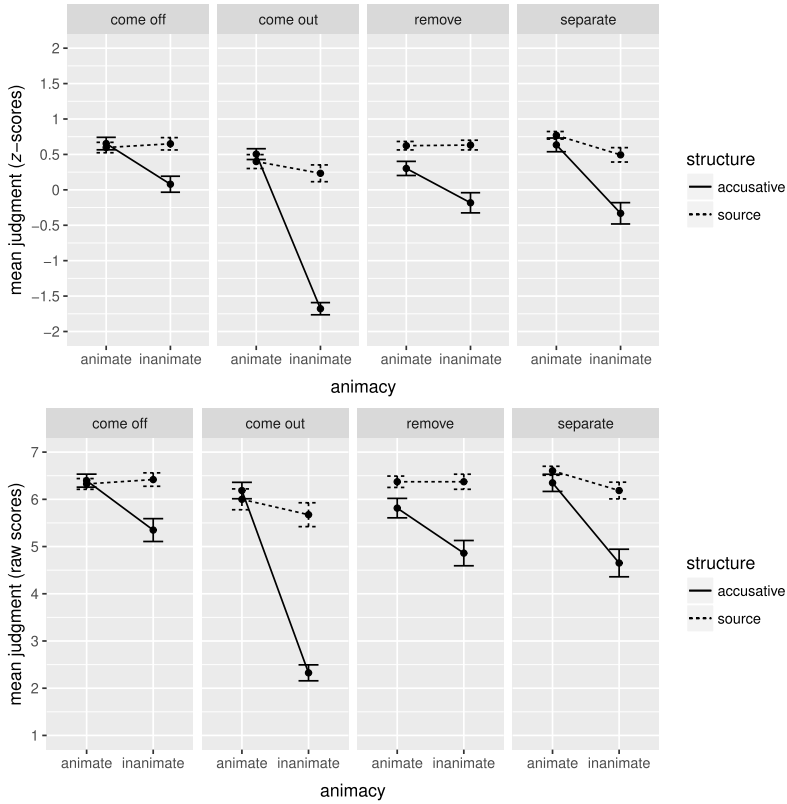



*Figure 2*
Interaction plots for STRUCTURE and ANIMACY with the four accusative–source verbs.

four verbs, *hazure-ru* 'come off', *de-ru* 'come out', and *nuke-ru* 'remove', the interaction between STRUCTURE and ANIMACY is significant (*hazure-ru* 'come off': β = 0.60, SE = 0.26, $p = .04$; *de-ru* 'come out': β = 2.02, SE = 0.20, $p < .01$; *nuke-ru* 'remove': β = 0.49, SE = 0.19, $p = .01$). With *hanare-ru* 'separate', the interaction between these two factors is only marginally significant (β = 0.67, SE = 0.35, $p = .07$). ANIMACY is a significant predictor with all four verbs (*hazure-ru* 'come off': β = –0.56, SE = 0.19, $p < .01$; *de-ru* 'come out': β = –2.19, SE = 0.44, $p < .01$; *nuke-ru* 'remove': β = –0.49, SE = 0.14, $p < .01$; and *hanare-ru* 'separate': β = –0.96, SE = 0.25, $p < .01$). In contrast, STRUCTURE is a significant predictor only with *nuke-ru* 'remove' (β = 0.32, SE = 0.14, $p = .02$); it is not significant with the other three verbs (*hazure-ru* 'come off': β = –0.04, SE = 0.18, $p = .81$; *de-ru* 'come out': β = –0.10, SE = 0.14, $p = .47$; *hanare-ru* 'separate': β = 0.13, SE = 0.25, $p = .60$).



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

### 4.1.5 *Discussion*

The results of Experiment 1 show that the accusative–source verbs generally exhibited the predicted interaction between the animacy of subjects and the object markings. In particular, the findings with three of the four accusative–source verbs, *hazure-ru* 'come off', *de-ru* 'come out', and *nuke-ru* 'remove', are exactly what the transitive–unaccusative alternation analysis predicted, with the dispreference for inanimate subjects with the accusative structure contributing to the significant interaction between STRUCTURE and ANIMACY. Although the interaction between these two factors did not reach significance with *hanare-ru* 'separate', the mean acceptability judgments for the sentences with *hanare-ru* 'separate' show a tendency that is consistent with the other accusative–source verbs: the difference between the means for the sentences in the accusative and oblique structures is larger within the inanimate condition than within the animate condition. Table 2 summarizes the findings with the accusative–source verbs from Experiment 1.

| Accusative–source verbs | *hazure-ru* 'come off' | *de-ru* 'come out' | *nuke-ru* 'remove' | *hanare-ru* 'separate' |
|---|---|---|---|---|
| Does the animacy of subjects interact with the object marking? | Yes | Yes | Yes | Yes* |

*The interaction was only marginally significant ($p = .07$).

*Table 2*
Findings with the accusative–source verbs from Experiment 1.

Among the four accusative–goal verbs, the results of only one of them, *sawar-u* 'touch', show a significant interaction between STRUCTURE and ANIMACY, as predicted by the transitive–unaccusative alternation hypothesis. With the other three accusative–goal verbs, either only ANIMACY affected the mean acceptability judgments so that the means for the sentences within the inanimate condition are lower, as with *nobor-u* 'climb' and *agar-u* 'rise', or neither of the factors affected the mean acceptability judgments, as with *kudar-u* 'descend'. Table 3 summarizes the findings with the accusative–goal verbs from Experiment 1.

In sum, the findings with the accusative–source verbs are consistent with the prediction of the transitive–unaccusative alternation hypothesis, while the same prediction was borne out with only one of the accusative–goal verbs. Thus, our findings in Experiment 1 provide clear support for the transitive–unaccusative alternation analysis only with respect to the accusative–source verbs. As for the results with the accusative–goal verbs, there are two possible interpretations. One is that *sawar-u* 'touch' is a transitive–unaccusative alternation verb, while the other three accusative–goal verbs belong to a different type of verb that is



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

| Accusative–goal verbs | *nobor-u* 'climb' | *kudar-u* 'descend' | *agar-u* 'rise' | *sawar-u* 'touch' |
|---|---|---|---|---|
| Does the animacy of subjects interact with the object marking? | No | No | No | Yes |

*Table 3*
Findings with the accusative–goal verbs from Experiment 1.

not yet identified. The other possibility is that none of the four accusative–goal verbs are transitive–unaccusative alternation verbs, and the interaction between the animacy of subjects and the object markings found with *sawar-u* 'touch' has an independent explanation. In order to obtain further evidence for the transitive–unaccusative alternation analysis for the accusative–source verbs, and additional data that inform us about the underlying structure of the accusative–goal verbs, we examined another diagnostic that makes direct reference to the alleged structural difference between the two hypothesized underlying structures: subjects' ability to license floating numeral quantifiers.

## 5. Licensing of floating numeral quantifiers

The transitive–unaccusative alternation hypothesis makes a set of predictions concerning the ability of subjects of the alternating verbs in the two different structures to license floating numeral quantifiers (FNQs) inside VP. As a classifier language, Japanese uses a combination of a numeral (e.g. *san* 'three') and a classifier (e.g. *-nin*), which agrees with a semantic feature of the modified noun (e.g. [+human] with *-nin*), to express the quantity of NPs.

(18) Keesatsukan-ga **gootoo-o** **san-nin** oikake-ta
police.officer-NOM burglar-ACC 3-CL chase-PST
'The police officers chased three burglars.'

Following previous studies, I will call a combination of a numeral and a classifier a numeral quantifier (NQ). As is well known, NQs and the NPs they modify (the ASSOCIATES) may be non-adjacent in Japanese; that is, NQs can 'float'. It has been noted that the ability of subjects to license floating NQs (FNQs) in preverbal positions depends on the type of verbs that select them. Preverbal FNQs are readily licensed by passive subjects (19a) and unaccusative subjects (19b) but not by active transitive subjects (20a) or unergative subjects (20b) (Miyagawa 1989b).



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(19) (a) *Passive transitive*

**Gootoo-ga** keesatsukan-niyotte **san-nin** oikake-rare-ta
burglar-NOM police.officer-BY 3-CL chase-PASS-PST
'Three burglars were chased by police officers.'

(b) *Unaccusative*

**Gakusee-ga** ofisu-ni **go-nin** ki-ta
student-NOM office-GOAL 5-CL come-PST
'Five students came to the office.'

(20) (a) *Active transitive*

**#Keesatsukan-ga** gootoo-o **san-nin** oikake-ta
police.officer-NOM burglar-ACC 3-CL chase-PST
('Three police officers chased the burglars.')

(b) *Unergative*

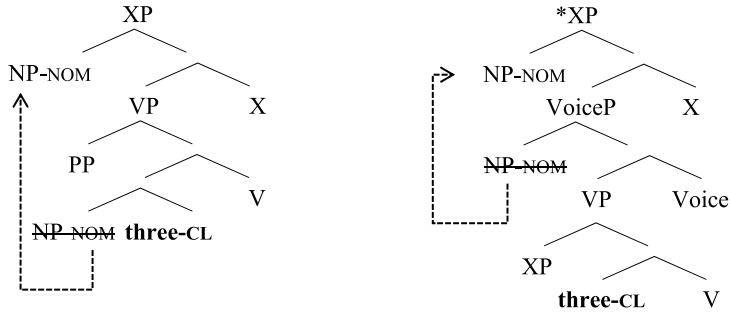
**#Gakusee-ga** geragera-to **go-nin** warat-ta
student-NOM loudly 5-CL laugh-PST
('Five students laughed loudly.')

Miyagawa (1989b) accounts for the contrasts in (19) and (20) with two assumptions: (i) an NQ and its associate must be in a syntactically local configuration in their base-generated positions, but the associate can 'strand' the NQ by undergoing syntactic movement, and (ii) passive and unaccusative subjects are base-generated as internal arguments inside VP and move to the sentence-initial position, while subjects of transitive and unergative verbs are base-generated external arguments. Under these assumptions, the FNQs in (19a–b) are licensed despite the presence of the intervening PPs, which are assumed to be inside VP, because their associates are base-generated as internal arguments inside VP, where they were in the required local configuration with the FNQs (21a). In contrast, (20a–b) are degraded because the subjects of these sentences were base-generated outside VP as external arguments, as specifiers of a functional head such as Pred (Bowers 1993), Voice (1994, 1996), or *v* (Chomsky 1995), and they were never in the required local configuration with the FNQs (21b).



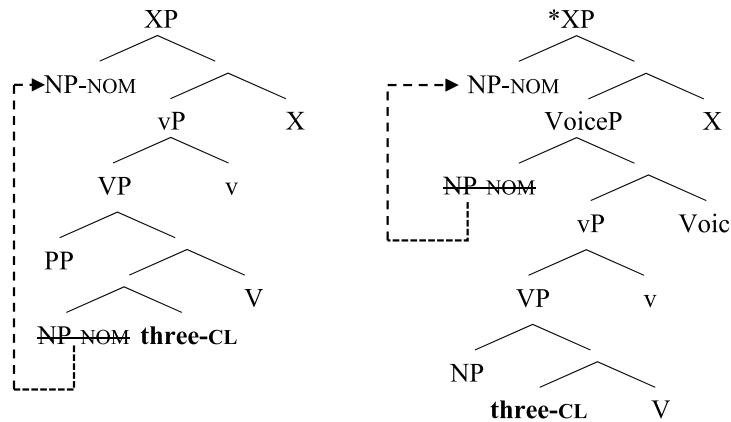
https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(21) (a) *Passive transitive and unaccusative* (b) *Active transitive and unergative*




Following Miyagawa (1989b) and subsequent studies on the distribution of FNQs (e.g. Terada 1990; Kitahara 1993; Kawashima 1998; Yamashita 2001, 2002, 2006; Fitzpatrick 2006; Miyagawa 2006; Ko 2007; Miyagawa & Arikawa 2007), I assume the 'stranding' analysis for FNQs (see Mihara 1998; Ishii 1999; Nakanishi 2007, 2008, for arguments that FNQs in Japanese can also be base-generated VP-modifiers, and Miyagawa 2012 for an extensive review of non-stranding approaches to FNQs). Given the contrast in (19) and (20) and the stranding analysis of FNQs, the transitive–unaccusative alternation analysis makes the following predictions about the ability of subjects of the alternating verbs in the two different structures to license VP-internal FNQs. By hypothesis, the alternating verbs in the oblique structure are unaccusatives. As such, their subjects are predicted to license VP-internal FNQs just like subjects of canonical unaccusatives (22a). In contrast, the same verbs in the accusative structure are transitives; their subjects are predicted to be unable to license FNQs just like subjects of canonical transitives (22b).

(22) (a) *Oblique structure* (b) *Accusative structure*






https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

## 5.1 *Experiment 2: Licensing of FNQs*

### 5.1.1 *Experimental design and predictions*

Experiment 2 was designed to compare the acceptability of sentences with the alternating verbs in the two different structures whose subjects are associates of NQs. In one condition, the associates are adjacent to the NQs ([adjacent]). In the other, the NQs and their associates are separated by a VP-internal element ([floating]). The transitive–unaccusative alternation hypothesis predicts that the difference in acceptability between the [adjacent] and the [floating] conditions should be significantly larger with the accusative structure than with the oblique structure. As such, the analysis predicts a significant interaction between the object marking (accusative vs. oblique) and the position of FNQs (adjacent vs. floating).

### 5.1.2 *Materials*

Experiment 2 had a 2 × 2 design of STRUCTURE (accusative vs. goal/source) and FNQ ([adjacent] vs. [floating]). The same four accusative–goal verbs (*nobor-u* 'climb', *kudar-u* 'descend', *agar-u* 'rise', and *sawar-u* 'touch') and four accusative-source verbs (*hazure-ru* 'come off', *de-ru* 'come out', *nuke-ru* 'remove', and *hanare-ru* 'separate') used in Experiment 1 were used to create the materials. As in Experiment 1, four lexicalizations of each verb were constructed for each of the four conditions (8 × 4 × 4 = 128) and distributed among four lists using a Latin Square design. Each of the resulting four lists of 32 sentences was combined with 38 filler sentences with various degrees of acceptability, resulting in 70 sentences per list. The order of each list was then pseudo-randomized. Example sentences of each condition are presented in (23). The complete set of the experimental and filler sentences for Experiment 2 is available online, via https://www.cambridge.org/core/journals/journal-of-linguistics, in the Supplementary Materials file alongside the present article.

(23) (a) *Oblique structure: [adjacent]*

Kooen-no sekininsha-wa [fuchuuina juugyooin$_i$-ga] [futa-ri$_i$]
park-GEN manager-TOP careless employee-NOM 2-CL
nyuuenken'uriba-**kara** katteni hanare-ta koto-ni
ticket.booth-SOURCE with.out.permission separate-PST fact-DAT
fuman-o nobe-ta
complaint-ACC state-PST

'The manager of the park complained about the fact that two careless employees left the ticket booth without permission.'



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(b) *Oblique structure: [floating]*

Kooen-no sekininsha-wa [fuchuuina juugyooin$_i$-ga]
park-GEN manager-TOP careless employee-NOM
nyuuenken'uriba-**kara** [futa-ri$_i$] katteni hanare-ta
ticket.booth-SOURCE 2-CL with.out.permission separate-PST
koto-ni fuman-o nobe-ta
fact-DAT complaint-ACC state-PST

'The manager of the park complained about the fact that two careless employees left the ticket booth without permission.'

(c) *Accusative structure: [adjacent]*

Kooen-no sekininsha-wa [fuchuuina juugyooin$_i$-ga] [futa-ri$_i$]
park-GEN manager-TOP careless employee-NOM 2-CL
nyuuenken'uriba-**o** katteni hanare-ta koto-ni
ticket.booth-ACC with.out.permission separate-PST fact-DAT
fuman-o nobe-ta
complaint-ACC state-PST

'The manager of the park complained about the fact that two careless employees left the ticket booth without permission.'

(d) *Accusative structure: [floating]*

Kooen-no sekininsha-wa [fuchuuina juugyooin$_i$-ga]
park-GEN manager-TOP careless employee-NOM
nyuuenken'uriba-**o** [futa-ri$_i$] katteni hanare-ta
ticket.booth-ACC 2-CL with.out.permission separate-PST
koto-ni fuman-o nobe-ta
fact-DAT complaint-ACC state-PST

'The manager of the park complained about the fact that two careless employees left the ticket booth without permission.'

### 5.1.3 *Procedure and participants*

A different group of forty-six university students in Tokyo, Japan, participated. The data from three participants were removed before analysis because they failed to complete the task as instructed. The procedure for Experiment 2 was identical to that for Experiment 1. The raw scores obtained in Experiment 2 were standardized ($z$-score transformed) prior to linear mixed-effects models analysis with VERB, STRUCTURE, and FNQ as fixed factors and subjects and items as random factors.

### 5.1.4 *Results*

#### 5.1.4.1 *The accusative–goal alternation verbs*

The results of the statistical analysis show that STRUCTURE is a significant predictor of the acceptability judgments of the sentences with the accusative–goal



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

verbs (β = 0.54, SE = 0.25, $p$ = .03). Neither FNQ nor the interaction between FNQ and STRUCTURE reached the level of significance (FNQ: β = –0.39, SE = 0.25, $p$ = .12; FNQ x STRUCTURE: β = –0.08, SE = 0.35, $p$ = .81). None of the verbs is a significant predictor. Figure 3 summarizes the mean $z$-scores and raw scores for the acceptability judgments for the sentences with the four accusative–goal verbs in the four conditions.

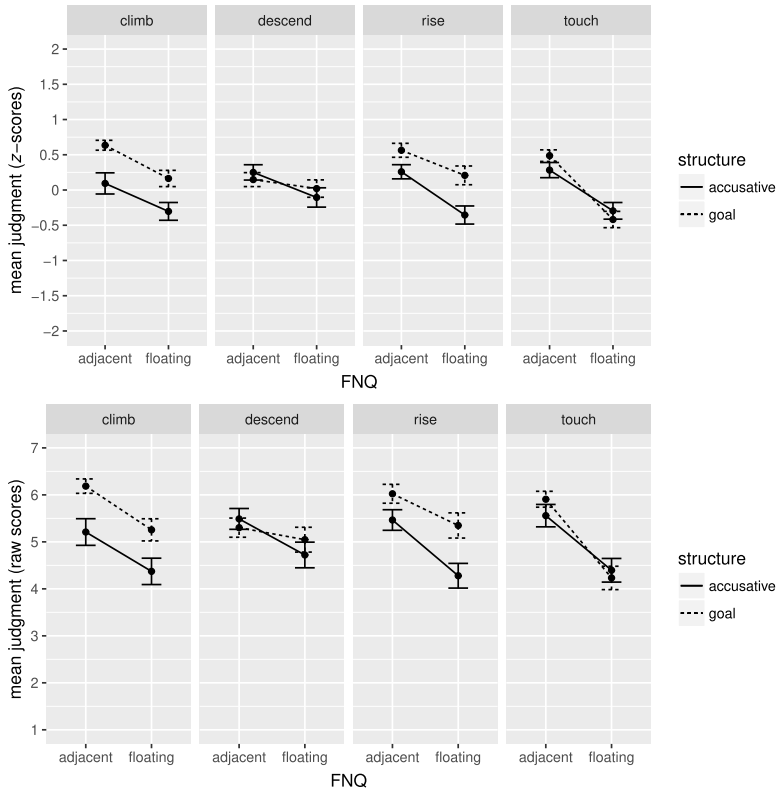



*Figure 3*
Interaction plots for STRUCTURE and FNQ with the four accusative–goal verbs.

Figure 3 shows that, with all four verbs, the two lines that connect the means of the sentences in the accusative condition and the goal condition are more or less parallel to each other and both slanted downward from the adjacent condition to the floating condition. These observations indicate that (i) there was no interaction between FNQ and STRUCTURE and (ii) the sentences in the floating condition were rated less acceptable than their counterparts in the adjacent condition in general. The results of the statistical analysis confirm the above observations. First, the interaction between the two factors is a significant predictor of the acceptability



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

of the sentences with none of the four accusative–goal verbs (*nobor-u* 'climb': β = –0.08, SE = 0.30, $p$ = .79; *kudar-u* 'descend': β = 0.24, SE = 0.37, $p$ = .53; *agar-u* 'rise': β = 0.24, SE = 0.36, $p$ = .51; and *sawar-u* 'touch': β = –0.33, SE = 0.36, $p$ = .37). FNQ is a significant predictor with *agar-u* 'rise' (β = –0.61, SE = 0.25, $p$ = .03) and *sawar-u* 'touch' (β = –0.57, SE = 0.25, $p$ = 0.04), but not with *nobor-u* 'climb' (β = –0.39, SE = 0.22, $p$ = .09) or *kudar-u* 'descend' (β = –0.36, SE = 0.26, $p$ = .19). STRUCTURE is a significant predictor with *nobor-u* 'climb' (β = 0.55, SE = 0.22, $p$ = .02) but not with the other three verbs (*kudar-u* 'descend': β = –0.10, SE = 0.26, $p$ = .70; *agar-u* 'rise': β = 0.30, SE = 0.25, $p$ = .25; and *sawar-u* 'touch': β = 0.20, SE = 0.25, $p$ = .44).

#### 5.1.4.2 *The accusative–source alternation verbs*

STRUCTURE is not a significant predictor of the acceptability of the sentences with the accusative–source verbs (β = 0.28, SE = 0.2, $p$ = .17), while FNQ is a significant predictor (β = –1.11, SE = 0.20, $p < .01$). Importantly, the interaction between FNQ and STRUCTURE is significant (β = 0.76, SE = 0.28, $p < .01$). None of the verbs is a significant predictor. Figure 4 summarizes the mean $z$-scores and raw scores for the acceptability judgments for the sentences with the four accusative–source verbs in the four conditions.

Figure 4 suggests that there is an interaction between FNQ and STRUCTURE with all four verbs, albeit to different degrees, as the differences between the means for the oblique (source) condition and the accusative condition appear to be larger within the floating condition than within the adjacent condition. The results of the analysis of the individual verbs are largely consistent with the above observations. First, with *hazure-ru* 'come off', *de-ru* 'come out', and *hanare-ru* 'separate', the interaction between FNQ and STRUCTURE is significant (*hazure-ru* 'come off': β = 0.76, SE = 0.18, $p < .01$; *de-ru* 'come out': β = 1.21, SE = 0.37, $p < .01$; and *hanare-ru* 'separate': β = 0.50, SE = 0.24, $p$ = .05). The same interaction is only marginally significant with *nuke-ru* 'remove' (β = 0.59, SE = 0.30, $p$ = .07). FNQ is a significant predictor of the mean acceptability of the sentences with all four verbs (*hazure-ru* 'come off': β = –0.86, SE = 0.26, $p < .01$; *de-ru* 'come out': β = –0.86, SE = 0.26, $p < .01$; *nuke-ru* 'remove': β = –0.52, SE = 0.21, $p < .03$; and *hanare-ru* 'separate': β = –0.75, SE = 0.17, $p < .01$). With *hazure-ru* 'come off', STRUCTURE is also significant (β = 0.28, SE = 0.13, $p$ = .03), but not with the other three verbs (*de-ru* 'come out': β = 0.04, SE = 0.26, $p$ = .88; *nuke-ru* 'remove': β = 0.12, SE = 0.21, $p$ = .58; and *hanare-ru* 'separate': β = –0.03, SE = 0.17, $p$ = .85).

### 5.1.5 *Discussion*

The results of Experiment 2 show that there is a significant interaction between STRUCTURE and FNQ with the sentences with three of the accusative–source verbs, *hazure-ru* 'come off', *de-ru* 'come out', and *hanare-ru* 'separate', with the interaction marginally significant with *nuke-ru* 'remove'. This is exactly what the



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

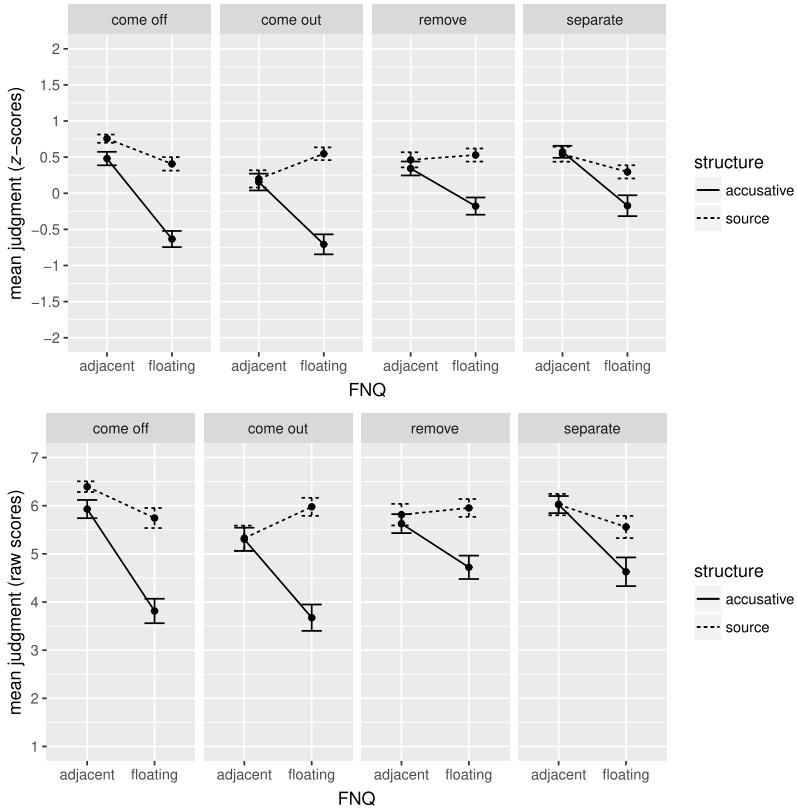



*Figure 4*
Interaction plots for STRUCTURE and FNQ with the four accusative–source verbs.

transitive–unaccusative alternation analysis together with the stranding analysis of FNQ predicted. In clear contrast, the interaction between STRUCTURE and FNQ is not significant with the sentences with all four accusative–goal verbs, *nobor-u* 'climb', *kudar-u* 'descend', *agar-u* 'rise', and *sawar-u* 'touch'.

## 6. TAKING STOCK

We are now ready to discuss what the findings from Experiments 1 and 2 tell us about the syntactic structures of the accusative–oblique alternation verbs.

### 6.1 *The accusative–source verbs*

Table 4 summarizes the findings from Experiments 1 and 2 with the four accusative–source verbs.



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

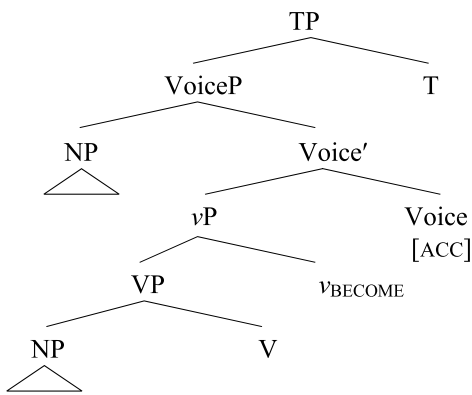
| Findings | Experiment 1: Does the animacy of subjects interact with the object marking? | Experiment 2: Does subjects' ability to license FNQs interact with the object marking? |
|---|---|---|
| *hazure-ru* 'come off' | Yes | Yes |
| *de-ru* 'come out' | Yes | Yes |
| *nuke-ru* 'remove' | Yes | Yes** |
| *hanare-ru* 'separate' | Yes* | Yes |

*The interaction was only marginally significant ($p$ = .07).
**The interaction was only marginally significant ($p$ = .07).

*Table 4*
Findings with the accusative–source verbs from Experiments 1 and 2.

The two predictions made by the transitive–unaccusative alternation hypothesis with respect to the interaction between the object marking and the animacy of subjects (Experiment 1) and subjects' ability to license FNQs (Experiment 2) are clearly borne out by two of the accusative–source verbs, *hazure-ru* 'come off' and *de-ru* 'come out'. With *nuke-ru* 'remove', the interaction between the object marking and the animacy of the subject is significant while the interaction between the object marking and subjects' ability to license FNQs is only marginally significant, and the opposite pattern is observed with *hanare-ru* 'separate', with which the interaction between the object marking and subjects' ability to license FNQs is significant while the interaction between the object marking and the animacy of the subject is only marginally significant. Overall, the means of the sentences with the four accusative–source verbs all show the right trend numerically. Thus, the findings from Experiments 1 and 2 provide strong support for the transitive–unaccusative alternation analysis of the accusative–source verbs. According to the analysis, sentences with the accusative–source verbs in the accusative structure have the underlying structure in (24).

(24)






https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

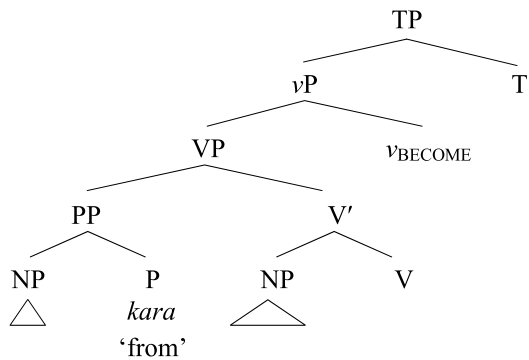
The analysis accounts for the following properties of sentences with the accusative–source verbs in the accusative structure.

(25) (a) Animate subjects are strongly preferred.
(b) Subjects do not license VP-internal FNQs.
(c) Objects are marked with accusative case.
(d) Objects are interpreted as locations from which subjects move away.
(e) They denote punctual events.

First, the Voice head introduces an external argument and case-licenses the object with accusative case in (24). This accounts for the presence of an animacy restriction on subjects of the accusative–source verbs in the accusative structure, originally observed by Teramura (1982) and further confirmed by the results of Experiment 1 (25a), and it also accounts for the accusative marking of the object (25c). Moreover, the subject of an accusative–source verb in the transitive structure is introduced as the specifier of the VoiceP in (24). As such, it is not in the required local relation with an FNQ inside VP at any point of the derivation. This accounts for the inability of these subjects to license VP-internal FNQs observed in Experiment 2 (25b). The fact that sentences with the accusative–source verbs in the accusative structure denote punctual events is accounted for by the presence of the $v_{\text{BECOME}}$ head of the *v*P embedded under the VoiceP, which introduces the abstract predicate *BECOME* (25e). This leaves the interpretation of the object as a location as the only contribution of the lexical semantics of the accusative–source verbs. Since these verbs are directed motion verbs, the natural interpretation of the object is that it refers to a location from which the subject moves away.

The oblique counterparts of the accusative–source verbs, on the other hand, have the unaccusative structure as their underlying structure, as in (26).

(26)




The analysis in (26) accounts for the following properties of sentences with the accusative–source verbs in the oblique structure.



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(27) (a) Subjects can be animate or inanimate.
(b) Subjects readily license VP-internal FNQs.
(c) Objects are marked with the source marker *-kara* 'from'.
(d) Objects are interpreted as locations from which subjects move away.
(e) They denote punctual events.

The lack of an animacy restriction on subjects of the accusative–source verbs in the oblique structure, again originally noted by Teramura (1982) and confirmed by the results of Experiment 1, is due to the subject of the accusative–source verbs in the oblique structure being an internal argument. As an internal argument, it receives a thematic role that is compatible with both animate and inanimate referents, such as UNDERGOER (27a). Since subjects of the accusative–source verbs in the oblique structure are internal arguments, they can be in the required local relation with a VP-internal FNQ at their base-generated position, accounting for the ability of subjects of the accusative–source verbs in the oblique structure to license VP-internal FNQs (27b). Furthermore, in (26), the oblique-marked 'object' is a PP headed by *-kara* 'from' (27c), and it is interpreted as a location from which subjects move away because of the combination of the lexical semantics of the accusative–source verbs and the postposition *-kara* 'from'. Lastly, the *v*P in the oblique structure is analyzed as headed by $v_{\text{BECOME}}$, accounting for the punctual interpretation of the accusative–source verbs in the oblique structure.

### 6.2 *The accusative–goal verbs*

Table 5 summarizes the findings from Experiments 1 and 2 with the four accusative–goal verbs.

| Findings | Experiment 1: Does the animacy of subjects interact with the object marking? | Experiment 2: Does subjects' ability to license FNQs interact with the object marking? |
|---|---|---|
| *nobor-u* 'climb' | No | No |
| *kudar-u* 'descend' | No | No |
| *agar-u* 'rise' | No | No |
| *sawar-u* 'touch' | Yes | No |

*Table 5*
Findings with the accusative–goal verbs from Experiments 1 and 2.

The interaction between the object marking and subjects' animacy was observed only with *sawar-u* 'touch' (Experiment 1), and the interaction between the object marking and subjects' ability to license FNQs was observed with none of the four accusative–goal verbs (Experiment 2). Thus, the results of Experiments



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

1 and 2 provide no support for the transitive–unaccusative analysis of three of the accusative–goal verbs, *nobor-u* 'climb', *kudar-u* 'descend', and *agar-u* 'rise'. In fact, the results from the two experiments suggest that these accusative–goal verbs are always transitive verbs regardless of the object marking. Such an analysis can provide a straightforward account for the general dispreference for inanimate subjects with these verbs and their subjects' inability to license VP-internal FNQs. However, a transitive analysis of the accusative–goal verbs faces two immediate challenges. First, it must account for the object marking alternation without the transitive–unaccusative alternation. Second, it must provide a non-syntactic account for the significant interaction between the object marking and the animacy of subjects with *sawar-u* 'touch' in Experiment 1, assuming that all four accusative–goal verbs share the same (transitive) structure.

In sum, the results from Experiments 1 and 2 provide strong support for the transitive–unaccusative alternation analysis of the accusative–source verbs, while they fail to support the same analysis for the accusative–goal verbs. Thus, despite the superficial similarities between the two types of accusative–oblique alternation verbs, we have come to the conclusion that only the accusative–source verbs are linked to the transitive and the unaccusative structures. The results of the two experiments further suggest the possibility that the accusative–goal verbs are always transitive regardless of the object marking. Such an analysis must account for the properties exhibited by the accusative–goal verbs without relying on the transitive–unaccusative alternation. This is the goal of Section 7.

## 7. The syntax of the accusative–goal verbs

In this section, I propose a transitive analysis of the accusative–goal verbs that accounts for (i) the object marking alternation and (ii) the finding from Experiment 1 that the animacy of subjects and the object marking interact with each other with *sawar-u* 'touch'. To that end, I first present evidence that the goal marker *-ni* is best analyzed as a structural case, i.e. dative case (Section 7.1). I then argue that the interaction between the animacy of subjects and the object marking observed with *sawar-u* 'touch' is a consequence of two interacting factors: *sawar-u* 'touch' is compatible with animate and inanimate subjects, and accusative–goal verbs denote two types of events in the two different structures (Section 7.2). These arguments lead me to conclude that the accusative–goal verbs involve (i) two different Voice heads, one that assigns accusative case and another that assigns dative case, and (ii) *v*Ps headed by two different *v*s: $v_{\text{DO}}$ and $v_{\text{BECOME}}$.

### 7.1 *The oblique marker -ni in accusative–goal alternations is dative case*

It is well known that *-ni* in Japanese is ambiguous between a dative case marker and a postposition (e.g. Sadakane & Koizumi 1995). Evidence that *-ni* with the accusative–goal verbs is a case marker comes from two standard diagnostic tests for the case marker-postposition distinction in Japanese. One of them has to do



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

with the licensing of FNQs: while NPs with a case marker license FNQs when relevant conditions are met, NPs inside PPs do not (e.g. Shibatani 1977, Miyagawa 1989b, Sadakane & Koizumi 1995).

(28) (a) *Gakusee-ga [$_{PP}$[$_{NP}$ **kuruma**]-**de**] **san-dai** ki-ta
student-NOM car-with 3-CL come-PST
('The students came in three cars.')
(b) *Gakusee-ga [$_{PP}$[$_{NP}$ **heya**]-**kara**] **mit-tsu** de-ta
student-NOM room-SOURCE 3-CL leave-PST
('The students left three rooms.')

It turns out that the NPs in the oblique objects marked by *-ni* can license an FNQ, suggesting that they are NPs followed by a case marker.

(29) (a) Gakusee-ga **yama-ni** **mit-tsu** nobot-ta
student-NOM mountain-GOAL 3-CL climb-PST
'The students climbed three mountains.'
(b) Kodomo-ga **kabin-ni** **futa-tsu** sawat-ta
child-NOM vase-GOAL 2-CL touch-PST
'The kids touched two vases.'

The second diagnostic involves cleft sentences. When an NP followed by a case marker is in the focus position in a cleft sentence, overt realization of the case marker makes the sentence less acceptable (30b). In contrast, when a PP is in the focus position in a cleft sentence, omission of the postposition makes the sentence less acceptable (30c) (Sadakane & Koizumi 1995).[7]

(30) (a) Taroo-ga hon'ya-de sono hon-o kat-ta
T-NOM book.store-at that book-ACC buy-PST
'Taroo bought that book at a book store.'
(b) Taroo-ga hon'ya-de kat-ta-no-wa
T-NOM book store-at buy-PST-NMNL-TOP
**sonohon(*-o)-da**
that book(-ACC)-COP.PRS
'It is that book that Taroo bought at a book store.'
(c) Taroo-ga sono hon-o kat-ta-no-wa
T-NOM that book-ACC buy-PST-NMNL-TOP
**hon'ya***(**-de**)**-da**
book.store(-at)-COP.PRS
'It is at a book store that Taroo bought that book.'

[7] The omission of a postposition from the focus position does not always make a cleft sentence unnatural. See Sadakane & Koizumi (1995) for a discussion of how the naturalness of cleft sentences with a postposition omitted from the focus position is subject to recoverability of the postposition.



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

If the *-ni* with the accusative–goal verbs is a case marker, as the FNQ test indicates, it should be possible to omit it when a *-ni* complement is in the focus position of a cleft sentence, whereas overt realization of *-ni* in the same position should make the cleft sentence less acceptable. This is what we find.

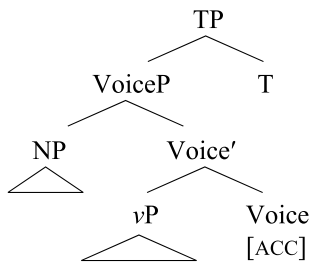
(31) (a) Kodomo-ga yama-no choojoo-ni/#o nobot-ta
child-NOM mountain-GEN summit-GOAL/#ACC ascend-NPST
'The child climbed to the top of the mountain.'

(b) Kodomo-ga nobot-ta-no-wa **yama-no**
child-NOM ascend-PST-NMNL-TOP mountain
**choojoo**-Ø/??**ni-da**
summit-Ø/GOAL-COP.PRS
'It is the top of the mountain that the child climbed to.'

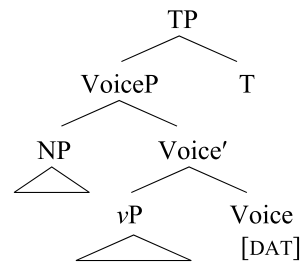
Note that (31b) cannot be analyzed as deriving from the accusative object, as *choojoo* 'summit' is incompatible with accusative marking, presumably because it cannot be construed as a path (31a).

Thus, I conclude that *-ni* on the oblique object of the accusative–goal verbs is a dative case marker. This means that the objects of the accusative–goal verbs are always licensed with a structural case, whether it is the accusative case with *-o* or the dative case with *-ni*. In order to account for this observation, I propose that these verbs involve two types of Voice heads: one that assigns accusative case (32a) and another that assigns dative case (32b).

(32) (a)




(b)




### 7.2 *The animacy of subjects and event types*

Our initial observation in (9), repeated below as (33), and the results of Experiment 1 show that inanimate subjects are not as acceptable as animate subjects with the accusative–goal verb *sawar-u* 'touch' in the accusative structure.

(33) (a) **Keiko-ga** yuka-o/ni sawat-ta
K-NOM floor-ACC/DAT touch-PST
'Keiko touched the floor.'

(b) **Keiko-no sukaato-ga** yuka-ni/#o sawat-ta
K-GEN skirt-NOM floor-DAT/#ACC touch-PST
'Keiko's skirt touched the floor.'



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

If the accusative–goal verbs are always transitive, where does this contrast with *sawar-u* 'touch' come from? I argue that the contrast in (33) is a result of an interaction between two factors.

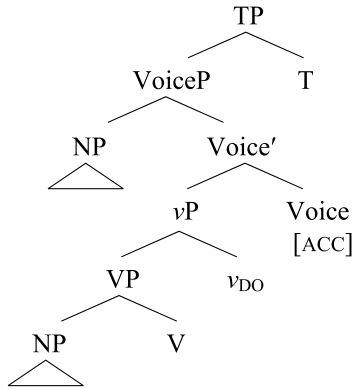
First, following Grimshaw (1993, 2005) and Rappaport-Hovav & Levin (1998), I assume that the meaning of verbs consists of linguistically relevant information, e.g. that verbs like *eat* and *drink* denote activities ('semantic structure' in Grimshaw 1993, 2005), and linguistically irrelevant information, e.g. that *eat* must involve solid edible objects while *drink* must involve liquids ('semantic content' in Grimshaw 1993, 2005). In the approach to verb meanings that I adopt, the linguistically relevant information is structurally encoded with different combinations of the semi-functional verbal heads Voice and *v* with different specifications. The linguistically irrelevant information, on the other hand, comes from idiosyncratic differences among individual verbs. Under this assumption, what makes *sawar-u* 'touch' different from the other accusative–goal verbs is that, while these verbs are all associated with the same transitive structure with an external argument, *sawar-u* 'touch' is the only one whose idiosyncratic meaning, or semantic content, makes it compatible with having an inanimate subject. The observation that the other three accusative–goal verbs are never quite compatible with inanimate subjects regardless of the object marking suggests that their semantic content requires animate subjects.

Second, the accusative–goal verbs denote two different types of event in the two different structures. As discussed in Section 2, the accusative–goal verbs denote durative events when they are in the accusative structure, while they denote punctual events in the oblique structure (see Table 1). Therefore, when an accusative–goal verb is in the accusative structure, its subject is interpreted as engaged in a durative event. While an animate human referent such as *Keiko* in (33a) makes a natural subject for a durative event, an inanimate referent such as *Keiko's skirt* in (33b) does not, as inanimate objects cannot sustain a continuous movement. This accounts for the dispreference for inanimate subjects with *sawar-u* 'touch' in the accusative structure. When the same verb is in the oblique structure, its subject is interpreted as engaged in a punctual event. Since punctual events do not require their subjects to sustain continuous movement, the animacy of the subjects does not matter. For the sake of concreteness, I propose that the accusative–goal verbs in the accusative structure involve a *v*P headed by $v_{\text{DO}}$ and therefore denote durative events, while the same verbs in the oblique structure have a *v*P headed by $v_{\text{BECOME}}$, denoting punctual events. Combining these proposals with the partial structures in (32a–b), we have (34a) and (34b) as the underlying structures for the accusative–goal verbs in the accusative structure and the oblique structure, respectively.

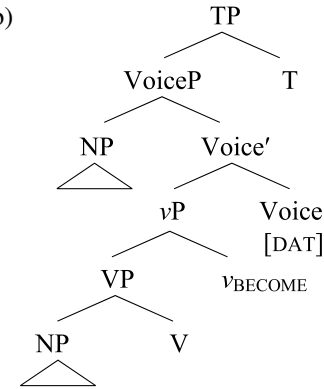


https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(34) (a)




(b)




The difference in the types of events that the accusative–goal verbs denote in the two different structures also accounts for the difference in the interpretation of objects discussed in Section 2.1. The object of the accusative–goal verbs is interpreted as a path when they are in the accusative structure because these verbs in the accusative structure denote durative events. Since the accusative–goal verbs are directed motion verbs, when they denote durative events, the natural interpretation of the object is that it is a path that the subject of these verbs moves along. In contrast, the object of the same verbs is interpreted as a goal when they are in the oblique structure because these verbs in the oblique structure denote punctual events. If motion events are interpreted as punctual achievement events, they require an end-point, and the dative-marked object provides it.

In sum, the proposed transitive analysis of the accusative–goal verbs in (34) accounts for the following properties of the accusative–goal verbs.

(35) (a) *Sawar-u* 'touch' requires animate subjects in the accusative structure while the other accusative–goal verbs always require animate subjects.
(b) Their subjects do not license VP-internal FNQs.[8]
(c) Their objects are marked with accusative or dative case.
(d) Their objects are interpreted as paths with the accusative structure and goals with the oblique (dative) structure.
(e) They denote durative events in the accusative structure and punctual events in the oblique structure.

[8] It should be pointed out that the results of Experiment 2, together with our analysis of the accusative–goal verbs, argue against the VP-modifier analysis of FNQs, according to which VP-internal FNQs are not adnominal modifiers stranded by NPs, but adverbial modifiers of telic events (Mihara 1998; Ishii 1999; Nakanishi 2007, 2008). As discussed in Section 5, subjects of the accusative–goal verbs do not license VP-internal FNQs regardless of the structure they are in. If FNQs were modifiers of telic/individuated events, as the adverbial analysis argues, FNQs should be licensed with the accusative–goal verbs in the oblique structure, as they denote telic/achievement events.



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

## 8. ACCUSATIVE–OBLIQUE ALTERNATIONS AND THE MORPHO-SYNTAX OF JAPANESE VERBS

Having proposed our analyses of the accusative–oblique alternations, in this section I explore their implications for the overall morpho-syntactic organization of Japanese verbs, by examining the relationship between the accusative–oblique alternations and a better-known alternation, the CAUSATIVE ALTERNATION. The examination shows that the relationship between the morphology and the syntax is transparent with the accusative–source verbs, but rather opaque with the accusative–goal verbs.

### 8.1 *The accusative–source alternation and the causative alternation*

One of the characteristics of the accusative–oblique alternations is that they involve no morphological change in the verb forms. In contrast, the better-known causative alternation involves morphological differences among the participating verbs (e.g. Jacobsen 1992, Haspelmath 1993, Kitagawa & Fujii 1999, Harley 2008).[9]

(36)

| | INTRANSITIVE | CAUSATIVE |
|---|---|---|
| (a) | *kog-e-ru* ‘scorch’ | *kog-as-u* ‘scorch’ |
| (b) | *tom-ar-u* ‘stop’ | *tom-e-ru* ‘stop’ |
| (c) | *kowa-re-ru* ‘break’ | *kowa-s-u* ‘break’ |
| (d) | *tor-e-ru* ‘come off’ | *tor-Ø-u* ‘remove’ |

It turns out that all four accusative–source verbs that we examined also participate in the causative alternation.

(37) *Accusative–source verbs with a causative form*

| | | |
|---|---|---|
| (a) | *d-e-ru* ‘come out’ | *d-as-u* ‘take out’ |
| (b) | *hazu-re-ru* ‘come off’ | *hazu-s-u* ‘remove’ |
| (c) | *hana-re-ru* ‘move away’ | *hana-s-u* ‘separate’ |
| (d) | *nuk-e-ru* ‘come off’ | *nuk-Ø-u* ‘remove’ |

Thus, these verbs have three different syntactic realizations: the unaccusative structure (38a), the transitive structure (38b), and the causative structure (38c).

(38) (a) Taroo-ga heya-kara d-e-ta
T-NOM room-SOURCE come.out-$v_{\text{BECOME}}$-PST
‘Taroo came out from the room.’

(b) Taroo-ga heya-o d-e-ta
T-NOM room-ACC come.out-$v_{\text{BECOME}}$-PST
‘Taroo came out of the room.’

[9] As an anonymous referee notes, Japanese does have at least one verb that exhibits the labile alternation pattern where the intransitive and causative forms are the same, as in *hirak-u* ‘open’.



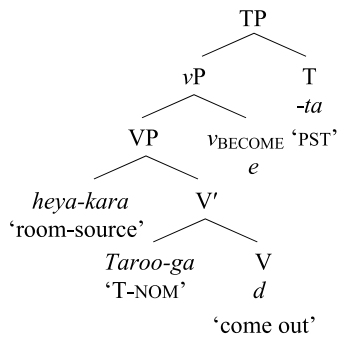
https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(c) Hanako-ga heya-kara Taroo-o d-ashi-ta
H-NOM room-SOURCE T-ACC come.out-$v_{CAUSE}$-PST
'Hanako took Taroo out of the room.'

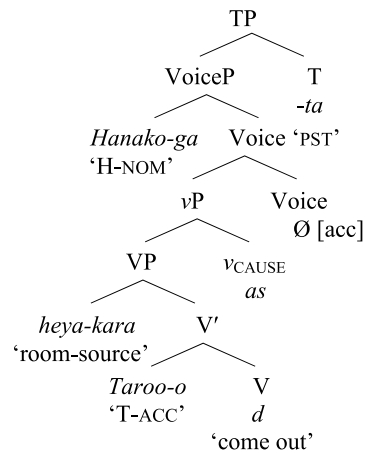
The causative structure is different from the unaccusative/transitive structure in three important ways. First, as pointed out above, the unaccusative and the transitive structures share the same morphological forms, whereas the causative structure is different.[10] Second, both unaccusative and transitive structures involve two arguments, which differ in how they are syntactically encoded, while the causative structure involves an additional argument, the causer, e.g. *Hanako* in (38c). Third, only the causative structure entails causation. While (38c) entails that something or someone caused *Taroo* to undergo a change of location, nothing CAUSES the change of location undergone by *Taroo* in (38a–b).

The transitive–unaccusative alternation analysis of the accusative–source verbs offers a transparent account of how the accusative–source verbs and their causative forms are related with each other syntactically and morphologically. Under the proposed analysis, the unaccusative structure of the alternating verbs involves $v_{BECOME}$ and lacks Voice (39a). The causative structure, on the other hand, involves $v_{CAUSE}$, which introduces causation, and a Voice, which introduces the causer, *Hanako* (39b). Thus, while the internal argument *Taroo* is realized as a nominative-marked derived subject in the unaccusative structure (39a), it remains an internal argument and accusative-marked in the causative structure (39b).

(39) (a) *Unaccusative*




(b) *Causative*




Empirical support for the proposed underlying structure of the causative sentence in (39b) comes from two standard diagnostics for the internal structure

[10] In other words, the distinction between $v_{BECOME}$ and $v_{DO}$ is morphologically underspecified. I thank an anonymous referee for pointing this out to me.



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

of causative sentences in Japanese. Since Shibatani (1973, 1976), it is widely accepted that causative sentences that involve lexically specific causative forms, LEXICAL CAUSATIVES, have a simple, mono-eventive structure, while causative sentences that are formed with the productive causative suffix -(*s*)*ase*, PRODUCTIVE CAUSATIVES, have a complex, bi-eventive structure (e.g. Miyagawa 1994, 1998; Harley 1995, 2008). The main arguments for the distinction come from the interpretation of the subject-oriented anaphor *jibun* 'self' and manner adverbials such as *mugon-de* 'without a word'. The complex structure of productive causatives arguably makes the interpretation of these two elements ambiguous.

(40) (a) Taroo-ga Hanako-ni **jibun**-no heya-de asob-ase-ta
T-NOM H-DAT self-GEN room-LOC play-$v_{CAUS}$-PST
'Taroo$_i$ let Hanako$_k$ play in his$_i$/her$_k$ room.'

(b) Hanako-ga Taroo-ni **mugon-de** heya-ni
H-NOM T-DAT no.word-with room-LOC
hair-ase-ta
enter-$v_{CAUSE}$-PST
'Hanako$_i$ made Taroo$_k$ enter the room without $ec_{i/k}$ saying anything.'

In (40a), the anaphor *jibun* can have either Taroo or Hanako as its antecedent. Under the assumption that the anaphor is subject-oriented, this suggests that productive causative sentences like (40a) have two subjects. In (40b), the manner adverb *mugon-de* 'without a word' can modify either Hanako's or Taroo's action. This has been taken to motivate the complex internal structure of productive causative sentences, e.g. two VPs. In contrast, with a lexical causative, the interpretation of the same elements is unambiguous.

(41) (a) Taroo-ga Hanako-o **jibun**-no heya-no mae-de
T-NOM H-ACC self-GEN room-GEN front-LOC
tom-e-ta
stop-$v_{CAUS}$-PST
'Taroo$_i$ made Hanako$_k$ stop in front of his$_i$/*her$_k$ room.'

(b) Hanako-ga Taroo-o **mugon-de** heya-ni
H-NOM T-ACC no.word-with room-LOC
i-re-ta
enter-$v_{CAUSE}$-PST
'Hanako$_i$ made Taroo$_k$ enter the room without $ec_{i/*k}$ saying anything.'

This observation, among other things, has motivated the analysis that lexical causatives have a simple structure with one subject and one VP.

Now, the proposed lexical causative analysis in (39b) predicts that a sentence with the causative form of an accusative–source verb that has the subject-oriented anaphor *jibun* or the manner adverb *mugon-de* 'without a word' should be unambiguous. The prediction is borne out.



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(42) (a) Hanako-ga Taroo-o **jibun**-no heya-kara
H-NOM T-ACC self-GEN room-SOURCE
d-ashi-ta
take.out-$v_{CAUSE}$-PST
'Hanako$_i$ took Taroo$_k$ out of her$_i$/*his$_k$ room.'

(b) Hanako-ga Taroo-o heya-kara **mogon-de**
H-NOM T-ACC room-SOURCE no.word-with
d-ashi-ta
take.out-$v_{CAUSE}$-PST
'Hanako$_i$ took Taroo$_k$ out of the room without $ec_{i/*k}$ saying anything.'

Thus, the syntactic relationship between the accusative–source verbs and their causative form appears to be exactly what their morphological forms suggest: the causative form of an accusative–source verb is the result of adding $v_{CAUSE}$ and a Voice to the structure of the accusative–source verb.

### 8.2 *The accusative–goal alternation and the causative alternation*

If we look at the four accusative–goal verbs that were examined in this study, we find that only two of them participate in the causative alternation.

(43) *Accusative–goal alternation verbs with a causative form*

| | | |
|---|---|---|
| (a) | *ag-ar-u* 'rise' | *ag-e-ru* 'raise' |
| (b) | *kud-ar-u* 'descend' | *kud-as-u* 'lower' |
| (c) | *nobor-u* 'climb' | Ø |
| (d) | *sawar-u* 'touch' | Ø |

In order to causativize *nobor-u* 'climb' and *sawar-u* 'touch', the productive causative suffix -(*s*)*ase* must be used.[11]

(44) (a) Taroo-ga yama-ni/o nobot-ta
T-NOM mountain-GOAL/ACC climb-PST
'Taroo climbed the mountain.'

(b) Hanako-ga Taroo-o yama-ni nobor-ase-ta
H-NOM T-ACC mountain-DAT climb-$v_{CAUSE}$-PST
'Hanako made Taroo climb the mountain.'

[11] The sentence in (44b) may also have an accusative-marked object. In that case, the embedded subject must be marked with dative case to avoid a violation of the 'double-o constraint' or a constraint against having two accusative-marked phrases in a simple clause (e.g. Kuroda 1965, Harada 1973, Poser 1981, Hiraiwa 2010).

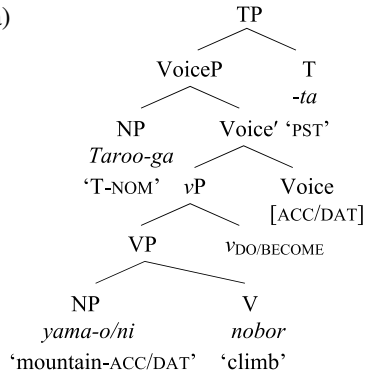
(i) Hanako-ga Taroo-ni yama-o nobor-ase-ta
H-NOM T-DAT mountain-ACC climb-$v_{CAUSE}$-PST
'Hanako made Taroo climb the mountain.'



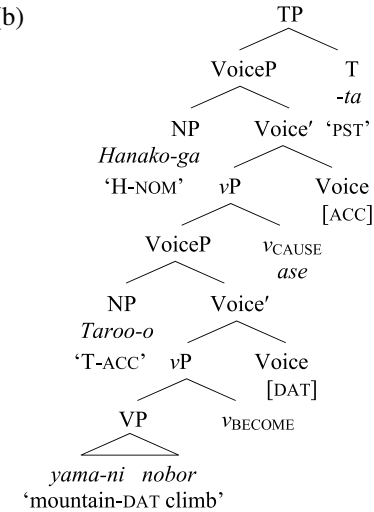
https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

Under the assumption that the productive causative sentences involve a complex structure, (44b) must have the underlying structure in (45b).

(45) (a)




(b)




In fact, if the structure in (44b) added the anaphor *jibun* or the manner adverbial *mugon-de* 'without a word' it would be ambiguous, as predicted by the structure in (45b).

(46) (a) Hanako-ga Taroo-o **jibun-**no ie-no yane-ni
H-NOM T-ACC self-GEN house-GEN roof-DAT
nobor-ase-ta
climb-$v_{CAUSE}$-PST
'Hanako$_i$ made Taroo$_k$ climb the roof of her$_i$/his$_k$ house.'

(b) Hanako-ga Taroo-o yane-ni **mugon-de**
H-NOM T-ACC roof-DAT no.word-with
nobor-ase-ta
climb-$v_{CAUSE}$-PST
'Hanako$_i$ made Taroo$_k$ climb up the roof without $ec_{i/k}$ saying anything.'

The other two accusative–goal verbs, *ag-ar-u* 'rise' and *kud-ar-u* 'descend', have lexically specific causative forms, as in (47b) and (48b).

(47) (a) Taroo-ga kaidan-o/ni-kai-ni ag-at-ta
T-NOM stairs-ACC/second-floor-DAT rise-$v_{DO}$-PST
'Taroo went up the stairs/to the second floor.'

(b) Hanako-ga Taroo-o ni-kai-ni ag-e-ta
H-NOM T-ACC second-floor-DAT rise-$v_{CAUSE}$-PST
'Hanako made Taroo come up to the second floor.'



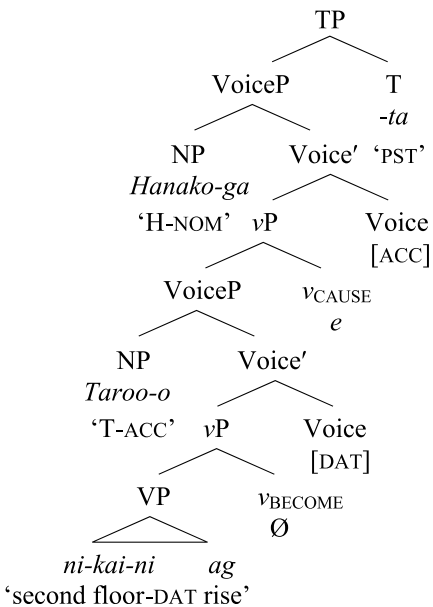
https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

(48) (a) Taroo-ga yama-no fumoto-o/ni kud-at-ta
T-NOM mountain-GEN foot-ACC/DAT descend-$v_{DO}$-PST
'Taroo descended the foot of the mountain/to the foot of the mountain.'

(b) *Hanako-ga Taroo-o yama-no fumoto-ni
H-NOM T-ACC mountain-GEN foot-DAT
kud-ashi-ta
descend-$v_{CAUSE}$-PST
('Hanako made Taroo go down to the foot of the mountain.')

For reasons that are not clear, (48b) with the causative form *kud-as-u* 'lower' is unacceptable.[12] However, the causative version of (47a), (47b), is acceptable. Our analysis of the accusative–goal verbs as transitive verbs predicts that (47b) should have the same underlying structure as (45b), i.e. (49).

(49)




There are at least two problems in the analysis in (49), however. First, it is not clear why the head of the lower *v*P, $v_{BECOME}$, realized as *at* in (47a), must disappear

[12] Instead of *kud-as-u* 'descend-CAUSE', *kud-ar-u* 'descend' with the productive causative suffix -(*a*)*ase* in (48b) produces an acceptable causative sentence.

(i) Hanako-ga Taroo-o yama-no fumoto-ni kud-ar-ase-ta
H-NOM T-ACC mountain-GEN foot-DAT descend-$^{v}$DO-$^{v}$CAUSE-PST
'Hanako made Taroo go down to the foot of the mountain.'



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

when the accusative–goal verb is embedded under $v_{\text{CAUSE}}$ *-e* in (49). Second, according to the analysis in (49), (47b) has a complex structure with an embedded VoiceP. As such, (49) wrongly predicts that (47b) with the anaphor *jibun* 'self' or the adverbial *mugon-de* 'without a word' should be ambiguous.

(50) (a) Hanako-ga Taroo-o **jibun**-no ie-no
H-NOM T-ACC self-GEN house-GEN
ni-kai-ni ag-e-ta
second-floor-DAT rise-$v_{\text{CAUSE}}$-PST
'Hanako$_i$ made Taroo$_k$ come up to the second floor of her$_i$/his$_k$ house.'

(b) Hanako-ga Taroo-o **mugon-de** ni-kai-ni
H-NOM T-ACC no.word-with second-floor-DAT
ag-e-ta
rise-$v_{\text{CAUSE}}$-PST
'Hanako$_i$ made Taroo$_k$ come up to the second floor without $ec_{i/*k}$ saying anything.'

The lack of ambiguity in (50a–b) suggests that these sentences have the simple structure of lexical causative sentences and the structure in (49) is untenable.

Do the above observations mean that the transitive analysis of the accusative–goal verbs proposed in Section 7 is untenable? Here, it is important to point out that the lack of ambiguity in (50a–b) is problematic for the transitive analysis of the accusative–goal verbs only under the assumption that the morphological forms of these verbs and their syntactic structures are always transparently related with each other. There is independent evidence from Japanese that the relationship between the morphological form of verbs and their syntactic structures is not always transparent. The evidence comes from an intransitive–causative pair *kae-r-u* 'return' (51a) and *kae-s-u* 'return' (51b).

(51) (a) Taroo/*Hon-ga toshokan-ni kae-t-ta
T/*book-NOM library-DAT return-$v_{\text{DO}}$-PST
'{Taroo/*The book} returned to the library.'

(b) Hanako-ga Taroo/hon-o toshokan-ni kae-shi-ta
H-NOM T/book-ACC library-DAT return-$v_{\text{CAUSE}}$-PST
'Hanako returned {Taroo/the book} to the library.'

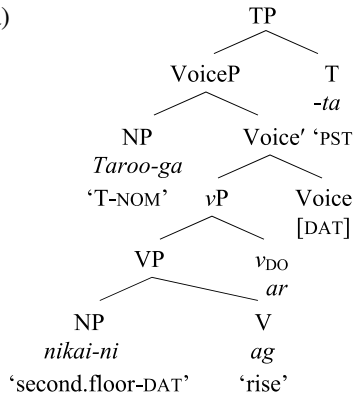
(51a) shows that an NP with an inanimate referent, such as *hon* 'book', cannot be the subject of the verb *kae-r-u* 'return', suggesting that the subject of *kae-r-u* 'return' must be agentive. In contrast, (51b) shows no such restriction on the object of the causative from *kae-s-u* 'return'. This contrast in the animacy restriction of 'what returns' in (51a–b) would be unexpected if (51b) is derived from (51a) by $v_{\text{CAUSE}}$ embedding the structure of (51a). Rather, the contrast in (51a–b) argues that (51a) and (51b) are syntactically independent of each other, despite their morphological forms. I argue that the pair of sentences in (47) with *ag-ar-u* 'rise' and *ag-e-ru* 'lift up' represents a similar case. Specifically,



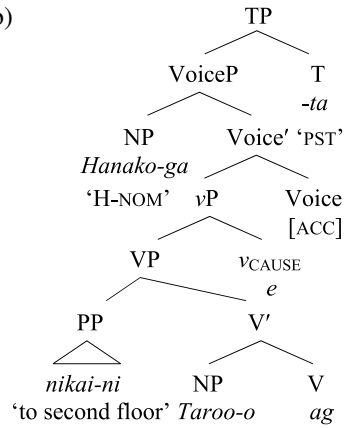
https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

I propose that these sentences have the underlying structures in (52a) and (52b), respectively, both involving a simple, mono-eventive clause structure.

(52) (a)




(b)




Thus, our examination of the relationship between the accusative–oblique alternations and the causative alternation has revealed that the relationship between the morphological forms of Japanese verbs and their syntactic structures is not always transparent. While the relationship between morphology and syntax is transparent with the accusative–source verbs and their causative forms, the morphological forms and the syntactic structures are independent of each other with the accusative–goal verbs and their causative forms, if they exist.

## 9. Conclusion

This paper examined two classes of accusative–oblique alternation verbs in Japanese, the accusative–goal verbs and the accusative–source verbs, and argued that, despite their superficial similarities, they are linked to two fundamentally different sets of syntactic structures. While the accusative–source verbs are mapped onto the transitive and the unaccusative structures, the accusative–goal verbs are mapped onto two different transitive structures. The novel experimental data introduced in this study highlighted the systematic differences in the syntactic and semantic properties that the two classes of the accusative–oblique alternation verbs exhibit in the two different structures.

The proposed analysis of the accusative–oblique alternations paints a rather complex picture of the mapping between the alternating verbs and their syntactic structures, whereby the interpretation of their arguments and the events that they denote is largely determined by the syntactic structures onto which these verbs are mapped. As such, the proposed analyses provide novel arguments for approaches to the lexical semantics–syntax interface, according to which the core meaning of verbs and their syntactic structures together construct the interpretation of verbs and their arguments (e.g. Perlmutter 1978; Hale & Keyser 1986, 1992,



https://doi.org/10.1017/S0022226719000136 Published online by Cambridge University Press

1993, 2002; Miyagawa 1989a, b; Hoekstra & Mulder 1990; Tsujimura 1990a, b, 1994, 1996; Hoekstra 1992; Levin & Rappaport-Hovav 1995; Rappaport-Hovav & Levin 1998; Ritter & Rosen 1998; Sorace 2000; McIntyre 2004; Folli & Ramchand 2005; Ramchand 2008). Furthermore, our examination of the relationship between the accusative–oblique alternations and the causative alternation revealed that the relationship between the morphological forms of verbs and their syntactic structures is not always transparent even in Japanese, a fairly consistent agglutinating language.

It is our hope that the novel experimental data from the accusative–oblique alternations in Japanese presented in this study and the proposed analysis of the alternations as involving multiple productive one-to-many mappings between verbs and their syntactic structures contribute to a better understanding and further development of the research into the mapping between verbs' meaning and their syntactic structures, and inspire more theoretical and experimental research into the topic.

## REFERENCES


Alexiadou, Artemis, Elena Anagnostopoulou & Florian Schäfer. 2006. The properties of anticausatives crosslinguistically. In Mara Frascarelli (ed.), *Phases of interpretation*, 187–211. Berlin: Mouton.

Borer, Hagit. 1994. The projection of arguments. In Elena Benedicto & Jeffry Runner (eds.), *Functional projections* (University of Massachusetts Occasional Papers 17), 19–48. Amherst, MA: Graduate Linguistics Student Association (GLSA).

Borer, Hagit. 2005. *Structuring sense*, vol. II: *The normal course of events*. Oxford: Oxford University Press.

Bowers, John. 1993. The syntax of prediction. *Linguistic Inquiry* 24, 591–656.

Burzio, Luigi. 1986. *Italian syntax: A government and binding approach*. Dordrecht: Reidel.

Butt, Miriam & Wilhelm Geuder. 1998. *The projection of arguments: Lexical and compositional factors*. Stanford, CA: Center for the Study of Language and Information.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Collins, Chris. 2005. A smuggling approach to the passive in English. *Syntax* 8, 81–120.

Cowart, Wayne. 1997. *Experimental syntax: Applying objective methods to sentence judgments*. Thousand Oaks, CA: Sage.

Cuervo, Maria Cristina. 2003. *Datives at large*. Ph.D. dissertation, MIT.

de Swart, Peter, Monique Lamers & Sander Lestrade. 2008. Animacy, argument structure, and argument encoding. *Lingua* 118, 131–140.

Dowty, David R. 1979. *Word meaning and Montague Grammar: The semantics of verbs and times in generative semantics and in Montague's PTQ*. Dordrecht: Kluwer.

Fitzpatrick, Justin M. 2006. *The syntactic and semantic roots of floating quantification*. Ph.D. dissertation, MIT.

Folli, Raffaella & Heidi Harley. 2005. Flavors of *v*: Consuming results in Italian and English. In Paula Kempchinsky & Roumyana Slabakova (eds.), *Aspectual inquiries*, 95–120. Dordrecht: Springer.

Folli, Raffaella & Heidi Harley. 2007. Causation, obligation, and argument structure: On the nature of little *v*. *Linguistic Inquiry* 38, 197–238.

Folli, Raffaella & Heidi Harley. 2008. Teleology and animacy in external arguments. *Lingua* 118, 190–202.

Folli, Raffaella & Gillian Ramchand. 2005. Prepositions and results in Italian and English: An analysis from event decomposition. In Henk J. Verkyul, Peter de Swart & Angeliek van Hout (eds.), *Perspectives on aspect*, 81–105. Dordrecht: Springer.

Fukuda, Shin. 2012. Aspectual verbs as functional heads: Evidence from Japanese aspectual verbs. *Natural Language & Linguistic Theory* 30, 965–1026.

Grimshaw, Jane. 1993. Semantic structure and semantic content. Ms., Rutgers University, New Brunswick, NJ.
Grimshaw, Jane. 2005. *Words and structure*. Stanford, CA: Center for the Study of Language and Information.
Hale, Ken & Samuel J. Keyser. 1986. *Some transitivity alternations in English* (Lexicon Project Working Paper 7). Cambridge, MA: Center for Cognitive Science, MIT.
Hale, Ken & Samuel J. Keyser. 1992. The syntactic character of thematic structure. In Roca (ed.), 107–144.
Hale, Ken & Samuel J. Keyser. 1993. On argument structure and the lexical expression of syntactic relations. In Ken Hale & Samuel J. Keyser (eds.), *The view from Building 20: A Festschrift for Sylvain Bromberger*, 53–108. Cambridge, MA: MIT Press.
Hale, Ken & Samuel J. Keyser. 2002. *Prolegomenon to a theory of argument structure*. Cambridge, MA: MIT Press.
Harada, S.-I. 1973. Counter Equi NP deletion. *Annual Bulletin* 7, 113–147. [Tokyo: University of Tokyo, Research Institute of Logopedics and Phoniatrics]
Harley, Heidi. 1995. *Subjects, events and licensing*. Ph.D. dissertation, MIT.
Harley, Heidi. 2008. On the causative construction. In Miyagawa & Saito (eds.), 20–53.
Harly, Heidi. 2009. The morphology of nominalization and the syntax of *v*P. In Anastasia Giannakidou & Monika Rathert (eds.), *Quantification, definiteness and nominalization*, 321–343. Oxford: Oxford University Press.
Harley, Heidi. 2013. External arguments and the Mirror Principle: On the distinctness of Voice and *v*. *Lingua* 125, 34–57.
Haspelmath, Martin. 1993. More on the typology of inchoative/causative verb alternation. In Bernard Comrie & Maria Polinsky (eds.), *Causatives and transitivity*, 87–120. Amsterdam: John Benjamins.
Hay, Jennifer, Christopher Kennedy & Beth Levin. 1999. Scalar structure underlies telicity in 'Degree Achievements'. In Tanya Mathews & Devon Strolovitch (eds.), *Semantics and Linguistic Theory IX* (SALT 9), 127–144. Ithaca, NY: Cornell University.
Hiraiwa, Ken. 2010. Spelling out the double-*o* constraint. *Natural Language & Linguistic Theory* 28, 723–770.
Hoekstra, Teun. 1992. Aspect and theta structure. In Roca (ed.), 145–174.
Hoekstra, Teun & René Mulder. 1990. Unergatives as copular verbs: Locational and existential predication. *The Linguistic Review* 7, 1–79.
Ishii, Yasuo. 1999. A note on floating quantifiers in Japanese. In Masatake Muraki & Enoch Iwamoto (eds.), *Linguistics: In search of the human mind*, 236–267. Tokyo: Kaitakusha.
Jacobsen, W. M. 1992. *The transitive structure of events in Japanese*. Tokyo: Kuroshio.
Kawashima, Ruriko. 1998. The structure of extended nominal phrases: The scrambling of numerals, approximate numerals, and quantifiers in Japanese. *Journal of East Asian Linguistics* 7, 1–26.
Kitagawa, Chisato & Hideo Fujii. 1999. Transitivity alternations in Japanese. In Liina Pylkkänen, Angelika van Hout & Heidi Harley (eds.), *Papers from the UPenn/MIT Roundtable on the Lexicon* (MIT Working Papers on Linguistics 35), 87–115. Cambridge, MA: MIT.
Kitahara, Hisatsugu. 1993. Numeral classifier phrases inside DP and the specificity effect. In Soonja Choi (ed.), *Japanese Korean Linguistics 3*, 171–186. Stanford, CA: Center for the Study of Language and Information.
Ko, Heejeong. 2007. Asymmetries in scrambling and cyclic linearization. *Linguistic Inquiry* 38, 49–83.
Kratzer, Angelika. 1994. On external arguments. In Elena Benedicto & Jeffry Runner (eds.), *Functional projections* (University of Massachusetts Occasional Papers 17), 103–130. Amherst, MA: Graduate Linguistics Student Association (GLSA).
Kratzer, Angelika. 1996. Severing the external argument from the verb. In Johan Rooryck & Laurie Zariing (eds.), *Phrase structure and the lexicon*, 109–137. Dordrecht: Kluwer.
Kuno, Susumu. 1973. *The structure of the Japanese language*. Cambridge, MA: MIT Press.
Kuroda, Shige-Yuki. 1965. *Generative grammatical studies in the Japanese language*. Ph.D. dissertation, MIT. [Published by Garland, 1979]
Kuznetsova, Alexandra, Per Bruun Brockhoff & Rune Haubo Bojesen Christensen. 2016. *lmerTest*: Tests in linear mixed effects models (R package version 2.0-30). https://cran.r-project.org/web/packages/lmerTest/lmerTest.pdf (accessed 9 July 2018).
Legate, Julie. A. 2012. Subjects in Acehnese and the nature of the passive. *Language* 88, 495–525.
Legate, Julie. A. 2014. *Voice and* v*: Lessons from Achenese*. Cambridge, MA: MIT Press.

Levin, Beth & Malka Rappaport-Hovav. 1995. *Unaccusativity: At the syntax–lexical semantics interface*. Cambridge, MA: MIT Press.
McIntyre, Andrew. 2004. Event paths, conflation, argument structure, and VP shells. *Linguistics* 42, 523–571.
Mihara, Ken-ichi. 1998. Suuryooshi renketsu koobun-to "kekka"-no gan'i [Quantifier linking construction and the implication of 'resultative']. *Gengo* 6, 86–95; 7, 94–102; 8, 104–113.
Miyagawa, Shigeru. 1989a. Light verbs and the ergative hypothesis. *Linguistic Inquiry* 18, 362–367.
Miyagawa, Shigeru. 1989b. *Structure and case marking in Japanese*. San Diego, CA: Academic Press.
Miyagawa, Shigeru. 1994. (*S*)*ase* as an elsewhere causative. Program of the Conference on Theoretical Linguistics and Japanese Language Teaching, Tsuda University, 61–76.
Miyagawa, Shigeru. 1998. (*S*) *ase* as an elsewhere causative and the syntactic nature of words. *Journal of Japanese Linguistics* 16, 67–110.
Miyagawa, Shigeru. 2006. Locality in syntax and floated numeral quantifiers in Japanese and Korean. In Timothy J. Vance & Kimberly Jones (eds.), *Japanese/Korean Linguistics 14*, 270–282. Stanford, CA: Center for the Study of Language and Information.
Miyagawa, Shigeru. 2012. *Case, argument structure, and word order*. New York: Routledge.
Miyagawa, Shigeru & Koji Arikawa. 2007. Locality in syntax and floated numeral quantifiers. *Linguistic Inquiry* 38, 645–670.
Miyagawa, Shigeru & Maria Babyonyshev. 2004. *The EPP, unaccusativity, and the resultative constructions in Japanese* (Scientific Approaches to Language No. 3). Kanda: Center for Language Sciences, Kanda University of International Studies.
Miyagawa, Shigeru & Mamoru Saito (eds.). 2008. *The Oxford handbook of Japanese linguistics*. Oxford: Oxford University Press.
Nakanishi, Kimiko. 2007. Measurement in the nominal and verbal domain. *Linguistics and Philosophy* 30, 235–276.
Nakanishi, Kimiko. 2008. Syntax and semantics of floating numeral quantifiers. In Miyagawa & Saito (eds.), 287–319.
Nakayama, Mineharu & Masatoshi Koizumi. 1991. Remarks on Japanese subjects. *Lingua* 85, 303–319.
Perlmutter, David M. 1978. Impersonal passives and the unaccusative hypothesis. *Berkeley Linguistics Society* (BLS) 4, 157–185.
Poser, William. 1981. The 'double-o constraint': Evidence for a direct object relation in Japanese. Ms., MIT.
Pylkkänen, Liina. 2002. *Introducing arguments*. Ph.D. dissertation, MIT.
Ramchand, Gillian C. 2008. *Verb meaning and the lexicon: A first phase syntax*. Cambridge: Cambridge University Press.
Rappaport-Hovav, Malka & Beth Levin. 1998. Building verb meanings. In Butt & Geuder (eds.), 97–134.
R Core Team. 2015. R: A language and environment for statistical computing. Vienna: R Foundation for Statistical Computing. https://www.R-project.org/ (accessed 9 July 2018).
Ritter, Elisabeth & Sara Thomas Rosen. 1998. Delimiting events in syntax. In Butt & Geuder (eds.), 135–164.
Roca, Iggy M. 1992. *Thematic structure: Its role in grammar*. Berlin: De Gruiter.
Sadakane, Kumi & Masatoshi Koizumi. 1995. On the nature of the 'dative' particle *ni* in Japanese. *Linguistics* 33, 5–33.
Schütze, Carson & Jon Sprouse. 2013. Judgment data. In Robert J. Podesva & Devyan Sharma (eds.), *Research methods in linguistics*, 27–50. Cambridge: Cambridge University Press.
Shibatani, Masayoshi. 1973. Semantics of Japanese causativization. *Foundations of Language* 9, 327–373.
Shibatani, Masayoshi. 1976. Causativization. In Masayoshi Shibatani (ed.), *Japanese generative grammar* (Syntax and Semantics 5), 239–244. New York: Academic Press.
Shibatani, Masayoshi. 1977. Grammatical relations and surface cases. *Language* 53, 789–809.
Sorace, Antonella. 2000. Gradients in auxiliary selection with intransitive verbs. *Language* 76, 859–890.
Sugamoto, Nobuko. 1982. Transitivity and objecthood in Japanese. In Paul Hopper & Sandra Thompson (eds.), *Studies in transitivity* (Syntax and Semantics 15), 423–447. New York: Academic Press.
Takano, Yuji. 2008. Ditransitive constructions. In Miyagawa & Saito (eds.), 423–455.

Takano, Yuji. 2011. Double complement unaccusatives in Japanese: Puzzles and implications. *Journal of East Asian Linguistics* 20, 229–254.
Tenny, Carol. 1994. *Aspectual roles and the syntax–semantics interface*. Dordrecht: Kluwer.
Terada, Michiko. 1990. *Incorporation and argument structure in Japanese*. Ph.D. dissertation, University of Massachusetts, Amherst.
Teramura, Hideo. 1982. *Nihongo no Sintakusu to Imi I* [Japanese syntax and semantics I]. Tokyo: Kuroshio.
Tsujimura, Natsuko. 1990a. Ergativity of nouns and case assignment. *Linguistic Inquiry* 21, 277–287.
Tsujimura, Natsuko. 1990b. The unaccusative hypothesis and noun classification. *Linguistics* 28, 929–957.
Tsujimura, Natsuko. 1994. Unaccusative mismatches and resulative in Japanese. In Masatoshi Koizumi & Hiroyuki Ura (eds.), *Formal approaches to Japanese linguistics 1* (MIT Working Papers in Linguistics 24), 335–354. Cambridge, MA: MIT Press.
Tsujimura, Natsuko. 1996. Another look at Unaccusative mismatches in Japanese. *Berkeley Linguistics Society* (BLS) 22, 400–416.
van Valin, Robert D., Jr. & David P. Wilkins. 1996. The case for effector: Case roles, agents and agency revisited. In Masayoshi Shibatani & Sandra Thompson (eds.), *Grammatical constructions: Their form and meaning*, 289–322. Oxford: Clarendon Press.
Yamashita, Hideaki. 2001. EPP and the ordering effects on interpretation: A preliminary study. *Nanzan Nihongo Kyooiku* [Nanzan studies in Japanese language education] 8, 300–338.
Yamashita, Hideaki. 2002. Is verb raising necessary for A-scrambling in Japanese? In Yoshio Endo, Roger Martin & Hideaki Yamashita (eds.), *Working Papers in Biolinguistics 1: Papers in Syntax and Semantics*, 99–116. Yokohama: Biolinguistics Association at Yokohama National University (BAY).
Yamashita, Hideaki. 2006. A-type movement in Japanese and the EPP. In Changguk Yim (ed.), *Seoul International Conference on Generative Grammar* (SICOGG) 8, 333–352. Seoul: Hankuk Universiry of Foreign Studies.
Yatsushiro, Kazuko. 1999. *Case licensing and VP structure*. Ph.D. dissertation, University of Connecticut.

*Author's address:* *Department of East Asian Languages and Literatures,*
*University of Hawai'i at Mānoa, 1890 East-West Rd.,*
*Honolulu, HI 96822, USA*
*fukudash@hawaii.edu*