Title: The Syntax of Variable Behavior Verbs: The Case of Accusative-Oblique Alternations in Japanese

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Abstract

This paper analyzes two-place Japanese motion verbs whose complements can be marked with either accusative case or an oblique marker (accurative-oblique alternation) and provides the first formal analysis of this phenomenon. It argues that the accusative-oblique alternation verbs can be mapped onto either the transitive or unaccusative structure, and syntactic realization and interpretation of their arguments change between the two alternative structures. Evidence for the proposed analysis comes from a set of contrastive behaviors exhibited by the alternating verbs in the two structures with respect to: (i) selectional restrictions on subjects, (ii) the ability of their subjects to license preverbal ‘floating’ numeral classifier phrases and (iii) scope interactions between the two arguments. The empirical data for these three pieces of evidence comes from carefully controlled acceptability judgment experiments ((i) and (ii)) and a truth value judgment experiment (iii). It is argued that the alternating verbs can be mapped onto these two syntactic structures because they denote motion events and therefore their subjects are underspecified for their syntactic realization as external or internal arguments. Two-place verbs that are inherently causative or agentive, on the other hand, must be mapped onto the transitive/unergative structure with an external argument subject and do not participate in the alternation. The paper also addresses how accusative-oblique alternation is related to, and different from, inchoative-causative alternation and presents evidence that aspectual properties of the alternating verbs, in particular telicity of events that they denote, do not affect the syntactic encoding of their arguments, contrary to the popular view that telicity of events dictates variable argument mapping (259 words).
The Syntax of Variable Behavior Verbs: The Case of Accusative-Oblique Alternations in Japanese

1. Introduction

Many Japanese two-place verbs that denote motion events allow their complements to be marked with either accusative case -o or an oblique marker, -ni ‘to’ or -kara ‘from’ (1).

(1) a. Taroo-ga yama-o/ni nobot-ta
    T-NOM mountain-ACC/GOAL ascend-PST
    ‘Taroo ascended/ascended to the mountain.’

b. Taroo-ga heya-o/kara de-ta
    T-NOM room-ACC/SOURCE come_out-PST
    ‘Taroo came out of/from the room.’

We call this phenomenon *accusative-oblique alternation*. Previous studies show that the arguments of these alternating verbs are interpreted differently depending on whether their complements are accusative-marked (the *accusative structure*) or oblique-marked (the *oblique structure*) (Kuno 1973; Teramura 1982). To the best of our knowledge, no formal analysis has been proposed to account for this behavior of these verbs.

In this paper, we present an account for the behavior of these verbs that largely relies on (i) syntactic structures that are made available by the grammar and (ii) the inherent lexical semantic properties of the verbs. We argue that the verbs of accusative-oblique alternations can be realized either as transitive verbs with an external argument subject or unaccusative verbs with an internal argument (derived) subject. The arguments for the proposed analysis come from the results of three experiments that examined
phenomena in which the arguments of the alternating verbs exhibit contrastive behaviors in the two structures: (i) selectional restrictions on subjects, (ii) the ability of subjects to license preverbal ‘floating’ numeral classifier phrases (NCPs) and (iii) scope interactions between the two arguments. We also address implications of the proposed analysis to larger issues in the theory of the mapping between verb meaning and syntactic structure is organized. First, we discuss how accusative-oblique alternation is related to, and different from, a better known verbal alternation, *inchoative-causative alternation*. There, we argue that the proposed analysis of the alternating verbs can be naturally extended to account for the morphosyntactic relationship among the inchoative, causative and transitive forms of a verb root. Second, we discuss the role of lexical semantics of verbs in their syntactic realizations. Following Levin (1999), we argue that the empirical data from accusative-oblique alternation support the position that the inherent lexical semantics of two-place verbs plays a crucial role in determining the syntactic structures onto which they are mapped. The accusative-oblique alternation verbs can be mapped onto either the transitive or unaccusative structure because they denote motion events, and subjects of motion verbs are underspecified for their syntactic realization as external or internal arguments. Two-place verbs that are inherently causative or agentive, on the other hand, must be mapped onto the transitive/unergative structure with an external argument subject. Evidence from accusative-oblique alternation also shows that telicity of events that the alternating verbs denote does not determine the syntactic encoding of their arguments, contrary to the popular view that telicity of events dictates variable

Thus, the proposed analysis of the accusative-oblique alternation verbs paints a picture of productive one-to-many mappings between verbs and their syntactic structures that are restricted to particular lexical semantic classes, i.e. motion verbs, whose core argument is underspecified for its syntactic encoding and its interpretation is partially determined by the syntactic structure to which these verbs are mapped onto. As such, to the extent it is successful, the proposed analysis provides novel arguments for approaches to the lexical semantics-syntax interface according to which the core meaning of verbs and their syntactic structures together ‘construct’ interpretation of verbs and their arguments (Hale and Keyser 1986, 1992, 1993, 2002; Hoekstra and Molder 1990; Hoekstra 1992; Sorace 1993, 1995, 2000; Ramchand 1997, 2008; McIntyre 2004; Zubizarreta and Oh 2007, among others) but it argues against telicity-driven approaches to variable mapping of arguments (Tenny 1992; Borer 1994, 2005; Ritter and Rosen 1998; van Hout 2000a, 2000b, 2204, among others).

This paper is organized as follows. Section 2 introduces the core set of data to be accounted for and presents a lexical-semantic analysis of the alternating verbs. Building on the original observations by Kuno (1973) about *accusative-goal alternation verbs* (1a) and by Teramura (1982) about *accusative-source alternation verbs* (1b), we present evidence that subjects and complements of these alternating verbs undergo systematic alternations in their interpretation between the two alternative structures. Section 3 introduces the proposed syntactic analysis of the accusative-oblique alternation verbs that
accounts for the link between the two complement markings and the alternations in interpretation of the arguments. Section 4 presents supporting arguments for the analysis from the three experiments that test predictions that the proposed analysis makes concerning the accusative-oblique alternation verbs in the two alternative structures: (i) selectional restrictions on subjects, (ii) the ability of subjects to license preverbal ‘floating’ numeral classifier phrases (NCPs) and (iii) scope interactions between the two arguments. Section 5 discusses two implications of the proposed analysis: (i) how accusative-oblique alternation is related to and different from inchoative-causative alternation and (ii) what determines whether a given two-place motion verb participates in the alternation or not. Section 6 concludes the paper.

2. Introducing Accusative-Oblique Alternation

This section first reviews the empirical observations from previous studies that concern two classes of verbs that undergo alternations in the complement marking: accusative-goal alternation verbs (Kuno 1973) and accusative-source alternation verbs (Teramura 1982). Incorporating their observations with our own, we argue that the arguments of these alternating verbs undergo the same systematic alternations in their interpretation and propose a broader class of alternation that subsumes these two subclasses: *accusative-goal alternation*.

2.1 Previous Studies

Kuno (1973, Ch. 5) notes that two-place directed-motion verbs in Japanese allow their complement to be marked with either accusative -*o* or the goal marker -*ni*.

(2) a. Taroo-ga **yama-ο/ni** nobot-ta
While Kuno discusses only a handful of directed-motion verbs (ori-ru ‘descend’, kudar-u ‘descend’ and nobor-u ‘ascend’), many more participate in these alternations, including ik-u ‘go’, kaer-u ‘return’, agar-u ‘rise’, sagar-u ‘come down’ and nagare-ru ‘flow’. These verbs are called *accusative-goal alternation verbs* in this study.

Kuno argues that the complement of an accusative-goal alternation verb is interpreted differently with the two different 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 taking place covering the entire dimension of the referent of the complement (path), while in the oblique structure the referent of the complement is the destination (goal) of the motion designated by these verbs. Thus, the accusative structure is infelicitous in (3a) 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 (3b) 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.

(3)  

a. Herikoputaa-de  *yama-o/ni*  nobot-ta  
helicopter-INST  mountain-#ACC/GOAL  ascend-PST
‘(I) ascended to the top of the mountain by helicopter.’

b. Jiipu-de 
   yama-o/ni nobot-ta
   jeep-INST mountain-ACC/GOAL ascend-PST

   ‘(I) climbed the mountain by a Jeep.’

(Kuno 1973: 98-99 (11), (12))

Kuno also shows that, when the referent of the complement is a natural path but an unlikely goal, e.g., kaidan ‘stairs’, it is compatible only with the accusative structure (4a). In contrast, when the referent of the complement is a natural goal but an unlikely path, such as choojoo ‘a summit’, it is compatible only with the oblique structure (4b).

(4) a. Kodomo-ga 
    kaidan-o/#ni ippo_ippo nobot-ta
    child-NOM stairs-ACC/#GOAL step_by_step ascend-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 ascend-PST

   ‘The child climbed to the top of the mountain.’

Independently of Kuno (1973), Teramura (1982: 106-108) discusses a group of two-place change-of-location verbs in Japanese that mark their complement with either accusative case -o or the source marker -kara ‘from’.

(5) 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 leave-PST
‘Taroo left/left from his hometown.’

In addition to the two verbs in (5), change-of-location verbs such as hazure-ru ‘come off’, nuke-ru ‘come off’, sar-u ‘leave’ and shirizok-u ‘resign’ also participate in the alternations. These verbs are called *accusative-source alternation verbs* in this study.

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

(6) a. Midoriio-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’.

In sum, we have two sets of two-place motion verbs in Japanese that allow for alternative complement markings: the accusative-goal alternation verbs and the accusative-source alternation verbs. The complement of the former is interpreted as a path or a goal depending on its marking, while the subject of the latter is subject to selectional restrictions only when it is in the accusative structure. In what follows, we argue that these observations are true to the verbs of both alternations and propose that they shuld be subsumed under a broader alternation class: *accusative-oblique alternation.*
2.2 **Interpretation of Subjects**

Initial evidence that the accusative-goal alternation verbs also impose selectional restrictions on their subjects comes from an accusative-goal alternation verb that was not discussed in Kuno (1973), *sawar-u* ‘touch’. Like the accusative-source alternation verbs discussed in Teramura (1982), *sawar-u* ‘touch’ is compatible with an inanimate subject only when it is in the oblique structure.

(7)  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.’

While the animate subject *Keiko* is compatible with the verb regardless of the complement marking (7a), the inanimate subject *Keiko-no sukaato* ‘Keiko’s skirt’ is compatible with the verb only in the oblique structure (7b). Although the contrast may not be as sharp as that in (7), a similar contrast obtains with another accusative-goal alternation verb, *kudar-u* ‘descend’.

(8) **Ken-no eran-da michi-wa** yama-no minami-ni/#o kurat-ta

   **K-NOM** choose-pst path-TOP mountain-GEN south-GOAL/#ACC descend-PST

   ‘The path Ken selected descended to the south of the mountain.’

These observations suggest the following generalization.

(9) Subjects of the alternation verbs in the accusative structure must be animate.
A plausible source of the animacy restriction in (9) is that subjects of the alternation verbs in the accusative structure are assigned an agent theta role. However, it should be noted that the traditional definition of agents as volitional doers would wrongly predicts that examples with the alternating verbs in the accusative structure with certain inanimate subjects, such as (10), should be unacceptable.

(10)  

a. **Fune-ga** minato-o de-ta  
**ship-NOM** port-ACC come_out-PST

‘The ship left the port.’

b. **Maruta-ga** kawa-o nagare-ta  
**log-NOM** river-ACC flow-PST

‘A log flowed through the river.’

In light of these examples, we adopt the approach that agents are particular instances of more general external arguments, and external arguments are entities that are responsible for realization of the relevant eventualities. Van Valin and Wilkins (1996) argue that agent derives from a more basic role effector, the dynamic participant doing something in the event, through interactions with different linguistic factors. For Ramchand (2008), the relevant abstract category is initiator (11). For Folli and Harley (2008), the animacy restrictions with external arguments derive from the notion of teleological capability (12).

(11) An initiator is an entity whose properties/behavior are responsible for the eventuality coming into existence. (Ramchand 2008: 24)

(12) Teleological capability: the inherent qualities and abilities of the entity to participate in the eventuality denoted by the predicate (Folli and Harley 2008:191)
Under these approaches to external arguments, *fune* ‘ship’ and *maruta* ‘log’ arguably possess the right properties to be external arguments of the relevant events. A ship, as a vehicle, has the capacity to move away from a location. A log can float and flow on a river because of its inherent properties. On the other hand, the inanimate subjects of the unacceptable examples with the alternating verbs in the accusative structure, such as *midori-no ekitai* ‘green liquid’ in (6a) and *Keiko-no skaato* ‘Keiko’s skirt’ in (7b), lack the appropriate properties for the relevant events. A skirt is not a kind of object that has properties that make it likely to engage in a self-propelled touching event. Similarly, liquid would not be participating in an event of coming out of a wound unless some external force, e.g. pressure, moves it in that way. Thus, we tentatively conclude that the animacy restriction observed with subjects of the alternating verbs in the accusative structure is a specific case of more general selectional restrictions imposed upon external arguments as entities that are responsible for realization of the relevant eventualities.

(13) Subjects of the alternation verbs in the accusative structure must be external arguments, i.e. entities that are responsible for realization of the relevant eventualities.

2.3 Interpretation of Complements

As discussed in Section 2.1, complements of the accusative-goal verbs are interpreted as paths when accusative-marked and as goals when oblique-marked with *-ni*. With the accusative-source alternation verbs, the difference in interpretation of complements between the two structures seems more subtle, but evidence suggests that there is a similar contrast with complements of the accusative-goal alternation verbs as well.
First, the examples in (14) below show that some NPs are compatible with being the complement of the accusative-source alternation verbs only in the oblique structure.

(14)  Hannin-ga hitojichi-kara/#o hanare-ta-no-o kakunin…¹

Suspect-NOM hostage-SOURCE/ACC leave-PST-NML-ACC confirm

‘Confirming that the suspect got separated from the hostage….’

The opposite pattern is observed with the same verb with a different complement.

(15)  Ochiai-ga Kyojin-o/#kara hanare-ta toki-no yooni²

O-NOM Giants-ACC/SOURCE leave-PST time-NML-ACC like

‘Just like when Ochiai left the Giants…’

The NP Kyojin ‘Giants’ is compatible with being the accusative complement of hanare ‘leave’ but incompatible with the oblique marking in (15).

Descriptively, the difference between the accusative and oblique complements of the accusative-source alternation verbs seems to be that the former refers to locations at which subjects engage in some activity prior to moving away from them, whereas the latter simply refers to locations from which subjects move away. Thus, (14) with the oblique complement is felicitous as the sentence denotes an event in which the suspect moved away from the hostage, while the accusative complement is infelicitous because the accusative complement is interpreted as referring to a location of an activity but such an interpretation is not available with hitojichi ‘hostage’. The situation is the opposite with the examples in (15). (15) with the accusative complement is felicitous because the

¹ http://homepage2.nifty.com/
² http://detail.chiebukuro.yahoo.co.jp/
accusative complement 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 complement is infelicitous in (15) because the oblique marking of the complement forces an interpretation in which the subject left the professional team as a location, which is pragmatically odd.

When we put together Kuno’s observation that the complement of the accusative-goal verbs can be either a path or a goal and our observation that the complement of the accusative-source alternation verbs can be either a location of an activity or a point of departure, a generalization that emerges is that an accusative-marked complement of the alternating verbs denotes a location of activities, while an oblique-marked complement denotes a location toward or from which the subject moves.

2.3 Section Summary

Building on the observations from Kuno (1973) and Teramura (1983), this section took a close look at interpretation of the arguments of the two subclasses of accusative-goal alternation verbs. The result is a novel generalization summarized in Table 1.

**Table 1: Interpretations of the Argument in Accusative-oblique Alternation**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Complements</th>
</tr>
</thead>
<tbody>
<tr>
<td>accusative structure</td>
<td>have properties of external arguments</td>
</tr>
<tr>
<td>oblique structure</td>
<td>lack properties of external arguments</td>
</tr>
</tbody>
</table>
The emerging picture is that the arguments of the two subclasses of alternation verbs undergo essentially the same alternation in their interpretation between the two alternative structures. Thus, we propose that these two alternation classes belong to the same broader class, which we call *accusative-oblique alternation*. Our generalization also shows that, although the alternation is visible only through the marking of complements, it clearly affects the interpretation of entire clauses, including complements and subjects. As such, the alternation cannot be analyzed as only involving complements, e.g. a case of differential object marking (e.g., Bossong 1983-1984; Torrego 1998; Aissen 2003).

3  The Syntax of Accusative-Oblique Alternations

In the previous section, we argued that accusative-goal alternation verbs and accusative-source alternation verbs form a single larger class, accusative-oblique alternation verbs. In this section, we address the question of why there exists such an alternation.

3.1  Alternating Verbs as Transitive Verbs

We have shown that the alternating verbs in the accusative structure require external argument subjects. This correlation is reminiscent of the Burzio’s Generalization.

(16)  Burzio’s Generalization: All and only the verbs that can assign a theta-role to the subject can assign accusative case to an object. (Burzio 1986:178)

In the Minimalist Program framework, the standard way to account for the Burzio’s Generalization, or the link between the presence of accusative case and the selection of external argument subjects, is to assume presence of a semi-functional verbal head Voice, which licenses an external argument and structural case (Kratzer 1994, 1996). Here, we adopt the recent hypothesis that a Voice head embeds another level of a semi-functional
verbal projection, \textit{v} (little \textit{v}) (e.g. Pylkännen 1999, 2002; Cuervo 2003; Collins 2005; Alexiadou, Anagnostopoulou and Schäfer 2006; Harley 2009, 2013a, 2013b; Legate 2010, 2012, 2014), whose sole function is to encode event types by introducing abstract predicates such as \textit{do}, \textit{cause} and \textit{become} (Harley 1995, 2008; Folli and Harley 2005, 2007). Under this analysis, examples of an alternating verb in the accusative structure, such as (17a), have the structure in (17b).

(17) a. Taroo-ga \textit{saka_michi-o} nobot/ori-ta

\begin{verbatim}
T-NOM          hill-ACC    ascend/descend-PST
\end{verbatim}

‘Taroo went up/down the hill.’

b. \begin{center}
\begin{tikzpicture}

  \node {TP}
  \node [below] {VoiceP} child {node {T} child {node {-ta} child {node {Voice} child {node {'PST'}}}}}
  \node [left] {NP} child {node {Taroo-ga} child {node {T-NOM'}}}}
  \node [below] {vP} child {node {Voice} child {node {Ø [acc]}}}
  \node [left] {NP} child {node {saka_michi-o} child {node {'hill-ACC'}}}
  \node [below] {VP} child {node {v_{DO} Ø/-i}}
  \node [left] {V} child {node {nobor / or}}

\end{tikzpicture}
\end{center}

In (17b), the subject is the specifier of a VoiceP, where external arguments are base-generated and thematically licensed by the Voice head, and the Voice head also provides accusative case to the complement inside VP. We assume that the active Voice head in Japanese is always phonologically null. The \textit{v} head, on the other hand, is phonologically null with \textit{nbor-Ø-u} ‘ascend’ but is overtly realized as -\textit{i} with \textit{or-i-ru} ‘descend’ (Harley
The v head introduces the abstract predicate do (vDO), which is responsible for the agentive interpretation of the alternative verbs in the accusative structure. The accusative marked complement is interpreted as a location of an activity, e.g., a path, due to the lexical semantics of the alternating verbs and the structure in (17b). These verbs denote motion events, whether they are directed-motion (e.g. nobor-u ‘ascend’), change of location (e.g. de-ru ‘come out’), or coming-to-contact events (e.g. sawar-u ‘touch’). As motion verbs, they all involve two arguments: an entity that moves and a location with respect to which the entity moves. When the motion event denoted by an alternating verb is interpreted as involving an external argument because of the structure in (17b), the natural interpretation of the complement is that it is a path that the subject moves through.

### 3.2 Alternating Verbs as Un accusative Verbs

We argue that the alternating verbs in the oblique structure are un accusatives (Perlmutter 1978; Burzio 1981, 1986) and that the oblique complement can be realized in two different ways: as an applied object NP or a PP. We first present the two unaccusative structures (3.2.1) and then provide their empirical justifications (3.2.2).

#### 3.2.1 The Oblique Complements as PPs and NPs

We propose that the structure with an NP oblique argument to involve a low applicative head (Pylkkänen 2000, 2002). This is the case for the accusative-goal alternation verbs in the oblique structure with the goal marker -ni, as in (18).

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3 The verb or-i-ru ‘descend’ is analyzed as morphologically complex because of the existence of the causative counterpart or-os-u ‘move down’, which shares the same root. The verbs like nobor ‘ascend’ have no such form. See Section 5.1 for a discussion.
Since the alternating verbs in the oblique structure are unaccusative verbs that lack external arguments, they do not involve a Voice head. They are embedded under a v that encodes the abstract predicate become (v\textsubscript{become}) and the verbs themselves in turn embed a projection of a low applicative head (ApplP). The low applicative head takes the oblique argument as its specifier and case-licenses it with dative case -ni. While the low applicative head is always phonologically null, v\textsubscript{become} is null with nobor-Ø-u ‘ascend’ but is overtly realized as -i with or-i-ru ‘descend’ in (18b).\textsuperscript{4} We assume that the word

\textsuperscript{4} Under the proposed analysis, the morphological form of v remains constant between the transitive and unaccusative structure. This issue will be discussed in Section 5.1.
order in (18a) is a result of the theme argument *Taroo-ga* undergoing a syntactic movement to the sentence-initial position.  

When the oblique argument is a PP, on the other hand, the alternating verbs are two-place unaccusative verbs with a locative PP argument and a theme NP argument. This is the case with the accusative-source alternation verbs in the oblique structure (20).

(19)  

<table>
<thead>
<tr>
<th></th>
<th>(19a)</th>
<th>(19b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>‘Taroo left his hometown.’</td>
<td></td>
</tr>
</tbody>
</table>

In (19b), the alternating verbs are embedded under a $v_{\text{BECOME}}$ and take a locative PP argument and the theme NP argument. The $v_{\text{BECOME}}$ head is null with *sar-Ø-u* ‘leave’, but it is overtly realized *-re* with *hana-re-ru* ‘leave’. Again, we assume that the theme argument undergoes a syntactic movement to the sentence-initial position in (19).

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5 Following previous studies, we assume that unaccusative subjects may stay in-situ in Japanese (Nakayama and Koizumi 1991; Yatsushiro 1999; Miyagawa and Babyonyshev 2004; and Takano 2008, 2011) and remain agnostic as to how they are fronted.
3.2.2 Evidence for the Two Unaccusative Structures

Evidence that -ni in the accusative-goal alternation verbs is a case marker – and therefore -ni marked oblique complements are NPs – and -kara in the accusative-source alternation verb is a postposition forming a PP comes from two standard diagnostic tests for the case marker-postposition distinction. One of the diagnostic tests has to do with licensing of floating numeral classifier phrases (NCPs). While NPs with a case marker can license floating NCPs when relevant conditions are met, NPs inside PPs do not license floating NCPs (e.g., Shibatani 1977, Miyagawa 1989, Sadakane and Koizumi 1995).

(20)  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. *Tegami-ga [PP [NP tomodachi]-kara] san-nin ki-ta  
    letter-NOM friend-SOURCE 3-CL come-PST  
    (‘Letters came from three friends.’)

It turns out that the NPs in the oblique complements marked by -ni can license a floating NCP, suggesting that they are NPs followed by a case marker. 6

(21)  a. Gakusee-ga yama-ni mit-tsu nobot-ta  
    student-NOM mountain-GOAL 3-CL ascend-PST  
    ‘The students climbed three mountains.’

6 As pointed out by an anonymous reviewer, there seem to be individual differences among native speakers in their judgments concerning licensing of floating NCPs by ni-marked NPs.
b. Kodomo-ga       kabin-ni       futu-tsu       sawat-ta
child-NOM         vase-GOAL       2-CL          touch-PST

‘The kids touched two vases.’

In contrast, the NPs in the oblique complements marked by -kara cannot license a floating NCP, suggesting that -kara is a postposition, as commonly assumed.

(22)  a. *Gakusee-ga       heya-kara       mit-tsu       de-ta
      student-NOM         room-SOURCE       3-CL          leave-PST

      (‘The students left three rooms.’)

b. *Chi-ga       kizuguchi-kara       futu-tsu       de-ta
      blood-NOM         wound-SOURCE       2-CL          leave-PST

      (‘Bleeding occurred from two wounds.’)

The second diagnostic test involves formation of cleft sentences. When an NP followed by a case marker is in the focus position in a cleft sentence, as in (23b) below, overt realization of the case marker makes the sentence less acceptable. In contrast, when a PP is in the focus position in a cleft sentence, omission of the postposition makes the sentence less acceptable (23c) (Sadakane and Koizumi 1995).

(23)  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       sono       hon(*-o)-da
      T-NOM         book store-at       buy-PST-NMNL-TOP       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 hon’ya*(de)-da

T-NOM that book-ACC buy-PST-NMNL-TOP book_store(-at)-COP.PRS

‘It is at a book store that Taroo bought that book.’

If the -ni with the accusative-goal alternation verbs is a case marker, as the floating NCP 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. These predictions are borne out.

(24) a. Kodomo-ga yama-no choojo-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 choojo-O/?ni-da

child-NOM ascend-PST-NMNL-TOP mountain summit-O/GOAL COP.PRS

‘It is the top of the mountain that the child climbed to.’

Note that (24b) cannot be analyzed as deriving from the accusative-marked complement, as choojo ‘summit’ is incompatible with being interpreted as path and therefore incompatible with accusative marking (24a), as discussed in Section 2.

As expected, the -kara with the accusative-source alternation verbs need to be overtly realized in the focus position in order for the cleft sentence to sound natural.⁷

⁷The omission of a postposition from the focus position does not always make a cleft sentence unnatural. See Sadakane and Koizumi (1995) for a discussion that the naturalness of cleft sentences with a postposition omitted from the focus position is subject to recoverability of the postposition.
(25) a. Hannin-ga sono hitojichi-kara/#o hanare-ta
    suspect-NOM that hostage-SOURCE/#ACC leave-PST

    ‘The suspect got separated from the hostage.’

b. Hannin-ga hanare-ta-no-wa sono hitojichi-kara/*Ø-da
    suspect-NOM separate-PST-NMNL-TOP that hostage-SOURCE/Ø-COP.PRS

    ‘It is from that hostage from whom the suspect got separated.’

Again, (25) cannot be analyzed as deriving from the accusative complement, as hitojichi ‘hostage’ is incompatible with being interpreted as a location of an activity and therefore incompatible with accusative marking, as seen in (25a). Thus, we conclude that -ni on the complement of the accusative-goal alternation verbs is a case marker, while -kara on the complement of the accusative-source alternation verbs is a postposition.

If the -ni marking of the oblique complement of the accusative-goal alternation verbs is a case marker, i.e. dative case, however, the question is what licenses it. Notice that neither T nor v is a plausible licensor of dative case, under the standard assumption that finite tense is associated with nominative case and the analysis of v that we adopted, according to which the sole function of v is to encode event types (e.g. Harley 2013). Our solution to this problem is that the alternating verbs in the oblique structure with an NP complement are instances of applicative constructions. The standard analysis of applicative constructions within the Minimalist Program is that they involve verbal heads – applicative heads – that introduce applied arguments as their specifier (Marantz 1993; Ngonyani 1996; McGinnis 2000, 2001; Pylkkänen 2000, 2002; Jeong 2007 among many others; see Peterson 2007 for an overview of different approaches to applicative
constructions). Since Pylkkänen (2000, 2002), it is widely assumed that applicative heads can be classified into two types: high applicative, which takes a VP as its complement, and low applicative, which takes an NP as its complement. We adopt the low applicative analysis in our analysis of the alternating verbs in the oblique structure with a locative NP.

(26)

Under the proposed analysis, the low applicative head in (26) takes an applied locative NP as its specifier and a theme NP as its complement and establishes a goal-theme relation. Importantly, this analysis provides us with the applicative head as the licensor of the dative case -ni on the NP oblique complement.

4. Supporting Arguments for the Proposed Analysis

This section presents empirical arguments for the proposed syntactic analysis of accusative-oblique alternation in Section 3 from three experiments. These experiments tested three predictions that the proposed analysis makes concerning the alternating verbs in the two alternative structures in terms of (i) selectional restrictions on their subjects, (ii) the ability of their subjects to license preverbal ‘floating’ numeral classifier phrases (NCPs) and (iii) scope interactions between their two arguments.

4.1 Argument I: Selectional Restrictions on Subjects
In Section 2.2, (14), we proposed the following generalization to account for the selectional restrictions that the alternating verbs impose on their subject only when they are in the accusative structure.

(27) Subjects of the alternation verbs in the accusative structure must be external arguments, i.e. entities that are responsible for realization of the relevant eventualities.

According to (27), all the alternating verbs should require their subjects to be external arguments – entities that are responsible for realization of the relevant eventualities – when they are in the accusative structure, regardless of their idiosyncratic differences. In contrast, such requirement should be absent with subjects of the same verbs in the oblique structure. In other words, the alternating verbs in the two structures should behave as two different classes of verbs in terms of selection of their subjects.

This section presents the result of a formal sentence acceptability judgment experiment that was designed to test the claim. As human referents are prototypical external arguments while inanimate objects that are incapable of self-propelled movements typically cannot be construed as external arguments, the animacy distinction would most clearly bring about the hypothesized difference in selectional restrictions on subjects imposed by the alternating verbs in the two alternative structures. Thus, most of the experimental sentences involved either a human subject or a subject that refers to an inanimate object that are incapable of self-propelled movement. As discussed in Section 2.2, however, external arguments cannot be reduced to animacy or volitionally. Thus, we also included sentences with non-human subjects that are intended to be external
arguments, such as non-human animates (e.g. kumo ‘spider’) and vehicles (e.g. sesuna ‘small airplane’). These were labelled as ‘animate’ for analytical purposes.

4.1.1 Experiment 1

An experiment was designed because we expected that the predicted difference in acceptability of the alternating verbs in the two structures with animate and inanimate subjects would 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 et al. 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 rated as more acceptable than their counterparts with inanimate subjects regardless of the complement marking. However, what our 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, because the alternating verbs in the accusative structure should trigger a stronger dispreference for inanimate subjects due to the external argument requirement. Thus, what we need to examine is whether there is an interaction between animacy of subjects and complement markings with acceptability judgments of sentences with the alternating verbs. Figure 1 below visually illustrates the predicted interactions.

Figure 1: A hypothetical model of an interaction between animacy of subjects and the two structures of the alternating verbs predicted by the proposed analysis
The higher line in darker grey connects hypothetical means of acceptability of sentences with the alternating verbs with animate subjects in the oblique structure (left) and in the accusative structure (right). The line is parallel to the x-axis of the figure because no significant difference between these two means is expected. The lower line in lighter grey connects hypothetical means of acceptability of sentences with the same verbs with inanimate subjects in the oblique structure (left) and in the accusative structure (right). This line is lower than the other line because sentences with inanimate subjects are expected to be rated as less acceptable than similar sentences with animate subjects regardless of the structure. What is important is that the lower line is predicted to slant down toward the right because a mean of acceptability of sentences in the accusative structure with inanimate subjects is expected to be significantly lower than that for sentences in the oblique structure with the same inanimate subjects.

**Materials and Design:** Experiment 1 had a 2 x 2 x 2 design: STRUCTURE (accusative vs. oblique), ANIMACY (animate vs. inanimate) and ALTERNATION TYPE (accusative-goal vs. accusative-source). The third factor was included to see if there are differences between
the two subtypes of accusative-oblique alternations. Three accusative-goal alternation verbs (nobor-u ‘ascend’, kudar-u ‘descend’ and sawar-u ‘touch’) and three accusative-source alternation verbs (de-ru ‘come out’, hanare-ru ‘separate’ and hazure-ru ‘come off’) were used in the materials. Five lexicalizations of each verb were constructed for each of the four conditions and distributed among five lists using a Latin Square design. The 24 experimental sentences in each list were mixed with 28 filler sentences. Thus, each subject rated 52 sentences. The order of sentences in each list was pseudo-randomized. Examples of the experimental sentences are provided in (28).

(28)  a. **Oblique structure - animate subject:**

Sachiko-no  gakuse-ga  kawaiteinai  penki-ni  sawat-ta
S-GEN        student-NOM    wet       paint-GOAL   touch-PST

‘Sachiko’s students touched the wet paint.’

b. **Oblique structure - inanimate subject:**

Sachiko-no  kami-ga  kawaiteinai  penki-ni  sawat-ta
S-GEN        hair-NOM      wet       paint-GOAL  touch-PST

‘Sachiko’s hair touched the wet paint.’

c. **Accusative structure - animate subject:**

Sachiko-no  gakuse-ga  kawaiteinai  penki-o  sawat-ta
S-GEN        student-NOM    wet       paint-ACC   touch-PST

‘Sachiko’s students touched the wet paint.’

d. **Accusative structure - inanimate subject:**

Sachiko-no  kami-ga  kawaiteinai  penki-o  sawat-ta
S-GEN   hair-NOM  wet   paint-ACC  touch-PST

‘Sachiko’s hair touched the wet paint.’

The experiment was conducted online using a survey website. The participants were instructed to use a 5-point Likert scale to judge the sentences, with 1 representing ‘unnatural’ and 5 representing ‘natural’. Thirty self-reported mono-lingual Japanese speakers participated in the experiment. They received no compensation.

**Results and Discussion:** Each participant's raw ratings were standardized (z-score transformed) prior to analysis. The results were then analyzed using linear mixed-effects models with STRUCTURE, ANIMACY and ALTERNATION TYPE as fixed factors and participants and items as random factors. Planned pairwise comparisons were also conducted to isolate the effect of animacy on each of the two alternative structures. All p-values were estimated using the MCMC method implemented in the languageR package for R (Baayen 2007; Baayen et al. 2008).

The results of an overall analysis indicate that all three factors are significant predictors of acceptability of the experimental sentences (STRUCTURE: $p = .01$, ANIMACY: $p = .0001$, and ALTERNATION TYPE: $p = .0012$). The interactions between STRUCTURE and ANIMACY and STRUCTURE and ALTERNATION TYPE are also significant (STRUCTURE x ANIMACY: $p = .0001$, STRUCTURE x ALTERNATION TYPE: $p = .0004$). Setting aside the effect of ALTERNATION TYPE for now, let us look at the results of the planned pairwise comparisons in Figure 2 (p-values are included for convenience).

*Figure 2: The effect of animacy for each of the alternative structures.*
First, the means for sentences with inanimate subjects were significantly lower than the means for sentences with animate subjects in both structures. This is expected given the preference for animate subjects with two-place verbs. Crucially, the highly significant interaction of STRUCTURE X ANIMACY ($p = .0001$) suggests that the dispreference for inanimate subjects is significantly larger with the alternating verbs in the accusative structure. This fact is corroborated in the pairwise comparisons of animate and inanimate subjects: the difference is only marginally significant with the oblique structure ($p = .0832$) while it is highly significant with the accusative structure ($p = .0001$).

Since ALTERNATION TYPE was a significant factor, the effects of the two other factors in each of the alternation types were also examined. The results show that the two alternation types contributed to the overall trend in slightly different ways. With the accusative-oblique alternation verbs, both preference for animate subjects and dispreference for inanimate subjects contributed to the significant difference between the accusative structure and the oblique structure, as can be seen in Figure 3.

*Figure 3: The effect of animacy within the accusative-goal alternation verbs.*
In contrast, preference for animate subjects remains virtually the same between the two alternative structures with the accusative-source alternation verbs. With them, it is dispreference for inanimate subjects with the accusative structure that contributed to the significant interaction between STRUCTURE and ANIMACY, as shown in Figure 4.

*Figure 4: The effect of animacy within the accusative-source alternation verbs.*

Putting these two trends together, we achieve the overall trend seen in Figure 2. While it is not clear why these two subclasses exhibited the difference in the way they did, what is important is the fact that the interaction between STRUCTURE and ANIMACY is significant whether the data from the two subclasses were analyzed separately or together.
These results support our claim that the alternating verbs in the accusative structure and
the same verbs in the oblique structure behave as two different classes of verbs with
respect to their selection of subjects, regardless of the subclass that they belong to.

4.2 Argument II: Licensing of Floating Numeral Classifier Phrases (NCPs)
The second set of arguments for the proposed analysis comes from the licensing of
floating NCPs. We first discuss the predictions that our analysis makes about the ability
of subjects of the alternating verbs to license preverbal floating NCPs under the
assumption that floating NCPs result from the host NPs (henceforth associates)
undergoing syntactic movement (Section 4.2.1). These predictions are tested in a formal
sentence acceptability judgment experiment (Section 4.2.2).

4.2.1 ‘Stranded’ Analysis of Floating NCPs
As is well known, NCPs and their associates may be non-adjacent in Japanese, or NCPs
can be ‘floating’. It has been noted that licensing of subject-oriented floating NCPs in
preverbal positions depends on the type of verbs. Preverbal floating NCPs can be readily
licensed by passive subjects (29a) and unaccusative subjects (29b) but not by active
transitive subjects (30a) or unergative subjects (30b) (Ueda 1986; Miyagawa 1989).

(29) a. **Gootoo-ga** keisatsukan-niyotte **san-nin** oikake-rare-ta

   **burglar-NOM** police_officer-BY **3-CL** chase-PASS-PST

   ‘Three burglars were chased by police officers.’ (Passive)

b. **Gakusee-ga** ofisu-ni **go-nin** ki-ta

   **student-NOM** office-GOAL **5-CL** come-PST

   ‘Five students came to the office.’ (Unaccusative)
(30)  a. #Keisatsukan-ga  gootoo-o  san-nin  oikake-ta
    police_officer-NOM  burglar-ACC  3-CL  chase-PST

    (Three police officers chased the burglars.) (Transitive)

b. #Gakusee-ga  geragera-to  go-nin  warat-ta
    student-NOM  loudly  5-CL  laugh-PST

    (‘Five students laughed loudly.’) (Unergative)

Miyagawa (1989) accounts for the contrasts in (29) and (30) by incorporating the following assumptions: (i) a floating NCP and its associated NP (the associate) must be in a syntactically local configuration in their base-generated positions, but the associate can ‘strand’ the NCP 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 floating NCPs in (29a-b) are licensed despite the presence of the intervening PPs because their associates are base-generated as internal arguments inside VP, where they were in the required local configuration with the NCPs. In contrast, (30a-b) are degraded because the subjects of these sentences were base-generated outside VP as external arguments. Thus, they were never in the required local configuration with the floating NCPs. Following Miyagawa (1989) and subsequent studies on the distribution of floating NCPs (e.g. Terada 1990; Kitahara 1993; Kawashima 1998; Yamashita 2001, 2002, 2006; Fitzpatrick 2006; Ko 2007; Miyagawa 2006; Miyagawa and Arikawa 2007), we assume the ‘stranding’ analysis for the NCPs in examples like (29) and (30) (see Ishii 1999, Kang 2002; Ko
2005, 2007; Nakanishi 2007, 2008; Ko and Oh 2010, 2012, for arguments that NCPs can also be base-generated as VP-modifiers in certain cases).

Given the contrast in (29) and (30), the proposed analysis of accusative-oblique alternation makes clear predictions about the ability of subjects of the alternating verbs to license floating NCPs. By hypothesis, the alternating verbs in the oblique structure are unaccusatives. As such, their subjects are predicated to license floating NCPs inside VP just like subjects of canonical unaccusatives. In contrast, the same verbs in the accusative structure are transitives; their subjects are predicated to be unable to license floating NCPs just like subjects of canonical transitives. Thus, we predict the following contrast.

(31) a. Gakusee-ga yama-ni go-nin nobot-ta
   student-NOM mountain-GOAL five-CL ascend-PST
   ‘Five students climbed the mountain.’ (OBLIQUE STRUCTURE)

b. #Gakusee-ga yama-o go-nin nobot-ta
   student-NOM mountain-ACC five-CL ascend-PST
   ‘Five students climbed the mountain.’ (ACCUSATIVE STRUCTURE)

4.2.2 Experiment 2
In order to test the above predictions, we designed an experiment that compared acceptability of sentences with the alternating verbs in the two alternative structures whose subjects are associates of NCPs. In one condition, the associates are adjacent to the NCPs (the adjacent condition). In the other, NCPs and their associates are separated by a VP-internal element (the floating condition). Our analysis predicts that the difference in acceptability between the adjacent and floating conditions should be significantly larger
with the accusative structure than with the oblique structure because of the proposed difference in their underlying structures. Figure 5 below visually illustrates our prediction.  

*Figure 5: A hypothetical model of an interaction between the two alternative structures and licensing of VP-internal floating NCPs*  

**Materials and Design:** Experiment 2 had a 2 x 2 design of STRUCTURE (oblique vs. accusative) and STRANDING (adjacent vs. floating). Two accusative-goal alternation verbs (*sawar-u* ‘touch’ and *nobor-u* ‘ascend’) and two accusative-source alternation verbs (*de-ru* ‘come out’ and *hanare-ru* ‘separate’) were used in the materials. Five lexicalizations of each verb were constructed for each of the four conditions and distributed among five lists using a Latin Square design, such that each list contained two tokens of each of the four conditions with no overlap between conditions in a single list. This resulted in five lists of eight sentences. The eight sentences in each list were combined with 52 filler sentences that also involved NCPs, resulting in 60 sentences per list. The order of each list was then pseudo-randomized such that related conditions were never presented in succession. Example sentences of each condition are presented in (32).
(32)  a.  **OBLIQUE + NON-STRANDED NCP:**

\[
\text{Jimushitsu-no juugyooin\text{-ga} \ yonin \ sono \ kinko-ni \ sawat-ta}
\]

office-GEN  employee-NOM  4-CL  that  safe-GOAL  touch-PST

b.  **OBLIQUE + STRANDED NCP:**

\[
\text{Jimushitsu-no juugyooin\text{-ga} \ sono \ kinko-ni \ yonin \ sawat-ta}
\]

office-GEN  employee-NOM  that  safe-GOAL  4-CL  touch-PST

‘Four office employees touched the safe.’

c.  **ACCUSATIVE + NON-STRANDED NCP:**

\[
\text{Jimushitsu-no juugyooin\text{-ga} \ yonin \ sono \ kinko-o \ sawat-ta}
\]

office-GEN  employee-NOM  4-CL  that  safe-ACC  touch-PST
d.  **ACCUSATIVE + STRANDED NCP:**

\[
\text{Jimushitsu-no juugyooin\text{-ga} \ sono \ kinko-o \ yonin \ sawat-ta}
\]

office-GEN  employee-NOM  that  safe-ACC  4-CL  touch-PST

‘Four office employees touched the safe.’

The experiment was conducted at Kansai Gaidai University in Osaka, Japan with 53 university students. The task was magnitude estimation (Stevens 1957; Bard et al. 1996; Keller 2000; Featherston 2005; Sprouse 2011). The reference sentence, given in (33), was identical for all five lists, and was assumed to be in the middle range of acceptability.

(33)  Shinnyuushain\text{-ga}  sake-o  imamadeni  yonin  non-da

incoming-employee-NOM  sake-ACC  so\_far  4-CL  drink-PST

‘Four of the new employees drank sake so far.’ (Gunji and Hasida 1998: 57)
The reference sentence was assigned a value of 100. The acceptability rating task was presented as a paper survey. The experiment began with a practice phase with a nonlinguistic task during which participants estimated the lengths of seven lines using another line as a reference set to a value of 100. This practice phase ensured that participants understood the concept of magnitude estimation. During the main phase of the experiment, ten items were presented per page, with the reference sentence appearing at the top of every page inside a textbox with black borders.

**Results and Discussion:** As in Experiment 1, each participant's raw ratings obtained in Experiment 2 were z-score transformed prior to analysis. The results were analyzed using linear mixed-effects models using STRUCTURE and STRANDING as fixed factors and participants and items as random factors. Two planned pairwise comparisons (also linear mixed-effects models) were also conducted to isolate the effect of stranding on each of the verb forms. All p-values were estimated using the MCMC method implemented in the languageR package for R (Baayen 2007; Baayen et al. 2008). Figure 6 summarizes the result of Experiment 2 (p-values are included for convenience).

*Figure 6: The effect of floating NCPs on the alternating verbs in the two structures.*
The interaction of STRUCTURE X STRANDING is highly significant ($p = .004$). Planned comparisons within each structure suggest that there is a significant dispreference for the floating condition in both the oblique and accusative forms of the verbs (oblique structure: $p = .0174$; accusative structure: $p = .0001$); however, the significant interaction also suggests that dispreference for the floating condition is greater for the alternating verbs in the accusative structure than for the same verbs in the oblique structure. These results lend support to our analysis, according to which the two different complement markings indicate two different underlying structures (transitive vs. unaccusative). Had the participants analyzed the two different complement markings as some kind of differential object marking while maintaining the same transitive structure for both accusative and oblique structures, the observed contrast would not have been obtained.

### 4.3 Argument III: Quantifier Scope

Our final argument comes from quantifier scope. We first discuss a characterization of Japanese as ‘scopally rigid’, followed by the predictions that our analysis makes about scope interactions of two quantifiers in sentences with the alternating verbs in the two alternative structures given scope rigidity in Japanese (Sections 4.3.1 and 4.3.2). These predictions are tested in a truth value judgement experiment (Section 4.3.3).

#### 4.3.1 Japanese as a Scopally Rigid Language and the Alternating Verbs

Japanese is known to be ‘scopally rigid’. That is, relative scope of two quantifiers in a simple sentence is determined by their surface positions in Japanese, unless syntactic movement has changed their hierarchical relation (Kuroda 1971; Kuno 1973; Hoji 1985). Thus, the example (34) below only has the interpretation in which the existential
quantifier subject takes scope over the universal quantifier object, as it does not involve reversing of the hierarchical relation between the two quantifiers. In contrast, in the example (35), the universal quantifier internal argument is scrambled to the sentence initial position, and the sentence is ambiguous with both the surface scope (∃ > ∀) and inverse scope (∀ > ∃) of the two quantifiers available.

(34) **Dareka**-ga kono heya-no **subete**-no hon-o yon-da
    someone-NOM this room-GEN all-GEN book-ACC read-PST

   ‘Someone read all the books in this room.’ {∃ > ∀; * ∀ > ∃}

(35) [kono heya-no hon-no **dore-mo**]_i **dareka**-ga t_i yon-da
    [this room-GEN book-GEN which-also]_i someone-NOM t_i read-PST

   ‘Someone read every book in this room.’ {∃ > ∀, ∀ > ∃}

Given scope rigidity in Japanese, the proposed analysis makes the following prediction regarding sentences with the alternating verbs with two quantifier arguments in a subject-complement order. In the accusative structure, only the surface scope of the two quantifiers is predicted to be available, just like with canonical transitive sentences without scrambling like (34), because a subject-complement order is the base-generated order of the arguments in the accusative structure (36a). In the oblique structure, however, the inverse scope of the two quantifiers is predicted to be available because a complement-subject order is the base-generated order of the arguments and the subject-complement order is derived by a movement of the subject (36b).

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8 We ignore the possibility of vacuous movements.
(36)  a. Accusative structure  b. Oblique structure

4.3.2 Experiment 3

In order to test the above predictions, a Truth Value Judgment Task (TVJT) (Crain and Thornton 1998) was used to elicit speakers’ intuitions about availability of surface and inverse scope of two quantifiers in sentences with the alternating verbs. In a TVJT, participants are presented with descriptions of situations (act-outs with stuffed animals, animations, written, etc.), followed by sentences that are intended to describe the situations (target sentences). Participants are to judge whether target sentences are true statements of described situations. In our experiment, target sentences with the alternating verbs in the two alternative structures, accusative and oblique, were created with an existential quantifier subject and a universal quantifier complement in a subject-complement order. These target sentences were then paired with two types of descriptions: (i) surface scope descriptions, with which the target sentences can be true with the surface scope of the two quantifiers, and (ii) inverse scope descriptions, with which the target sentences could only be true with the inverse scope of the two
quantifiers. In order to create a baseline, target sentences with canonical transitive verbs in a subject-complement order were also created and paired with corresponding surface and inverse scope descriptions. With surface scope descriptions, target sentences with all three types of verbs - the alternating verbs in the accusative structure, the alternating verbs in the oblique structure, and transitive verbs - are expected to be judged true. As such, no difference in distributions of judgments among the three types of target sentences are expected. With inverse scope description, in contrast, the proposed analysis predicts that the distribution of judgments with the alternating verbs in the accusative structure would be similar to that with the target sentences and canonical transitive verbs (i.e. overwhelmingly false) as they both involve the transitive structure. In contrast, the distribution of judgements with the alternating verbs in the oblique structure is expected to be different from that with canonical transitive verbs, as the hierarchical order of the arguments are reversed only with the alternating verbs in the oblique structure, as in (36b). Figure 7 illustrates these predictions.

*Figure 7: A hypothetical model of distributions of judgments with the alternating verbs in the two structures and canonical transitive verbs with inverse scope description*
The percentage of true judgments is estimated relatively low with the alternating verbs in the oblique structure due to an apparent linear order bias that we observed in pilot studies.

**Materials and Design:** The target sentences for the TVJT experiment were created with three accusative-goal alternating verbs (*nobor-u* ‘ascend’, *kudar-u* ‘descend’ and *sawar-u* ‘touch’) and three accusative-source alternating verbs (*de-ru* ‘leave’, *hanare-ru* ‘separate’ and *nuke-ru* ‘come off’) in the two alternative structures (oblique vs. accusative). Examples of actual target sentences with *nobor-u* ‘ascend’ (37) and corresponding surface and inverse scope descriptions are given in (38).

(37) a. *nobor-u* ‘ascend’ + **ACCUSATIVE**

Sakunen-no shiizun-chuu-ni san-nin-no dareka-ga

last_year-GEN season-during-in three-CL-GEN someone-NOM

dono yama-Ø-mo nobot-ta

which **mountain-ACC-also** ascend-PST

b. *nobor-u* ‘ascend’ + **OBLIQUE**

Sakunen-no shiizun-chuu-ni san-nin-no dareka-ga

last_year-GEN season-during-in three-CL-GEN someone-NOM

dono yama-ni-mo nobot-ta

which **mountain-GOAL-also** ascend-PST

‘During last season, someone among the three climbed every mountain.’

---

9 When the particle *mo* is attached to the direct object to form universal quantifier, as in (37a), the accusative case -o must be omitted. However, postpositions such as -ni and -kara must appear when followed by the same particle, as in (37b).
(38) a. **SURFACE SCOPE DESCRIPTION**: Akira, Takeshi and Keiko are college students whose hobby is mountain climbing. There are three mountains that are popular among mountain climbers in their area. They are called “Ooyama”, “Asahidake” and “Tateyama”. Last season, Akira climbed Ooyama, Asahidake, and Tateyama, Takeshi climbed Asahidake and Tateyama, while Keiko climbed Ooyama.

b. **INVERSE SCOPE DESCRIPTION**: Akira, Takeshi and Keiko are college students whose hobby is mountain climbing. There are three mountains that are popular among mountain climbers in their area. They are called “Ooyama”, “Asahidake” and “Tateyama”. Last season, Akira climbed Ooyama, Takeshi climbed Asahidake, while Keiko climbed Tateyama.

Four types of target sentence-description pairs were created by combining the target sentences with the alternating verbs in the two structures with the two types of scope descriptions: (a) accusative + surface, (b) accusative + inverse, (c) oblique + surface, and (d) oblique + inverse. Target sentences with four transitive verbs (*tabe-ru* ‘eat’, *mi-ru* ‘watch’, *hanas-u* ‘speak’, and *nom-u* ‘drink’) and their corresponding surface and inverse descriptions were also created to provide a baseline. In addition to the six alternating verbs and the four transitive verbs, target sentences and their corresponding surface and inverse scope descriptions with four unaccusative and four unergative were included as fillers.

The four combinations with each of the six alternating verbs were distributed into four lists using Latin Square design. The transitive, unergative and unaccusative verbs with the two types of descriptions were divided into two lists, one with six of these verbs
with a surface scope description and six other verbs with an inverse scope description, and the other with the opposite combination. These two lists were combined with the four lists with the alternating verbs, creating four lists of eighteen description-sentence pairs. The order of each list was pseudo randomized. The experiment was conducted with Ibex farm (http://spellout.net/ibexfarm/), a website that hosts online psycholinguistic experiments. One hundred five native speaker university students from Gifu University in Gifu, Japan, and Tsuda College in Tokyo, Japan, participated in the experiment.

**Results and Discussion:** The distributions of judgments obtained in the experiment were analyzed with Pearson’s chi-square tests.

Figure 8 below summarizes the distributions of judgements with transitive verbs and the alternating verbs in the accusative structure and the oblique structure with surface scope descriptions. The numbers inside the figure indicate their percentages.

*Figure 8: The distribution of judgments with surface scope descriptions.*

![Bar chart showing distribution of judgments](image)

As expected, over 90% of the sentences with all three verb types (transitives = 95.5%; the alternating verbs in the accusative structure = 94.6%; the alternating verbs in the
oblique structure = 93.4%) were judged as true. According to a chi-squared test, the distributions of judgments among the three verb types with surface scope descriptions are not significantly different from each other ($x^2 = .7592, df = 2, p = .6841$).

Figure 9 summarizes the distributions of judgments with transitive verbs and the alternating verbs in the accusative structure and the oblique structure with inverse scope descriptions. Again, the numbers inside the figure indicate their percentages.

Figure 9: The distribution of judgments with inverse scope descriptions.

As can be seen, the percentages of true judgments increases from transitive verbs, the alternating verbs in the accusative structure, and the alternating verbs in the oblique structure in that order (transitives = 5%; the alternating verbs in the accusative structure = 10.6%; the alternating verbs in the oblique structure = 15.4%). According to a chi-squared test, the distributions of judgments among the three verb types with surface scope descriptions are significantly different from each other ($x^2 = 10.6758, df = 2, p = .004806$).

Since the distributions of judgments were significantly different among the three types of predicates only with inverse scope descriptions, pair-wise chi-square tests among
the three predicates with respect to the distribution of judgments were performed to find out where the significant difference comes from. The results show that the difference between the distribution of judgments between transitive verbs and the alternating verbs in the accusative structure fails to reach significance ($\chi^2 = 3.1549$, $df = 2$, $p = .0757$) while the difference between the distribution of judgments between transitive verbs and the alternating verbs in the oblique structure is clearly significant ($\chi^2 = 9.6777$, $df = 2$, $p = .001865$). Thus, our predictions were borne out with these results: the distributions of judgments with inverse scope descriptions were not significantly different between transitive verbs and the alternating verbs in the accusative structure, while they are significantly different between transitive verbs and the alternating verbs in the oblique structure due to the higher percentage of true judgments with the alternating verbs in the oblique structure. Rather unexpectedly, however, the difference in the distributions of judgements between the alternating verbs in the two different structures turned out to be not significant ($\chi^2 = 1.155$, $df = 2$, $p = .285$). We speculate that this finding is a reflection of the structurally ambiguous nature of the alternating verbs. The higher than expected percentage of true judgments with the accusative structure (10.6%) may be seen as an influence of the existence of the alternative structure, which does not exist for canonical transitives. We must leave this question for the future studies, however.

### 4.4 Section Summary

In this section, we presented three sets of empirical arguments for the proposed analysis of accusative-oblique alternations as transitive-unaccusative alternations from three experimental studies that show that the alternating verbs in the two alternative exhibit
contrastive behaviors with respect to (i) selectional restrictions on their subjects, (ii) licensing of preverbal NCPs by their subjects, and (iii) availability of inverse scope when their arguments are quantifiers. We argued that the proposed analysis, together with the independently motivated assumptions about unaccusative subjects in Japanese, correctly predicts those behaviors of the alternating verbs in the two alternative structures.

5 Implications of the proposed analysis

This section discusses two implications of our analysis of accusative-oblique alternation to larger issues concerning the mapping between verb meaning and syntactic structure: (i) how accusative-oblique alternation is related to and different from a better known verbal alternation, *inchoative-causative alternation* (Section 5.1) and (ii) what determines the membership of the alternating verbs in face of the fact that a large number of two-place verbs in Japanese do not participate in similar alternations (Section 5.2).

5.1 Accusative-Oblique Alternation and Inchoative-Causative Alternation

One of the characteristics of accusative-oblique alternation is that it involves no morphological change in the verb forms. This is in a clear contrast with a better known verbal alternation, *inchoative-causative alternation*, which involves morphological changes in the participating verbs (e.g. Jacobsen 1992, Kitagawa and Fujii 1999).

(39) INCHOATIVE 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 some of the accusative-oblique alternating verbs participate in inchoative-causative alternations as well, as in (40) and (41).

(40) Accusative-goal alternation verbs with a causative form:

a. *or-i-ru* ‘descend’  *or-os-u* ‘move down’
b. *kae-r-u* ‘return’  *kae-s-u* ‘return’
c. *ag-ar-u* ‘rise’  *ag-e-ru* ‘raise’
d. *sag-ar-u* ‘come down’  *sag-e-ru* ‘lower’

(41) Accusative-source alternation 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* ‘pull out’

According to the proposed analysis of the accusative-oblique alternation verbs, therefore, these verbs have three different syntactic realizations: the unaccusative and the transitive form, as in (42a) and (43a), and the causative form, as in (42b) and (43b).

(42) a. Taroo-ga (yama-no) higashi-gawa-ni/o or-i-ta
    
    T-NOM (mountain-gen) east-side-GOAL/ACC descend-v\textsc{become/do}-PST
    
    ‘Taro descended the east side/to the east side (of the mountain).’

b. Kyuujotai-ga higashi-gawa-ni Taroo-o or-oshi-ta
    
    rescue_team-NOM east-side-GOAL T-ACC descend-v\textsc{cause}-PST
    
    ‘The rescue team dropped Taro off to the east side (of the mountain).’

(43) a. Taroo-ga heya-kara/o d-e-ta
T-NOM room-SOURCE/ACC come_out-v\textsc{become}/\textsc{do}-\textsc{pst}

‘Taroo came out from the room/of the room.’

b. Hanako-ga heya-kara Taroo-o d-ashi-ta

H-NOM room-SOURCE T-ACC take_out-v\textsc{cause}-\textsc{pst}

‘Hanamo took Taro out of the room.’

While these three forms are clearly morphologically related, the causative form of the alternating verbs is different from the other two forms, unaccusative and transitive, in three important ways. First, the alternating verbs in the unaccusative and the transitive structure share the same morphological forms, whereas the causative form is different. Second, the alternating verbs in both the unaccusative and the transitive structure involve two arguments and the difference between them is how these arguments are syntactically encoded, while the causative form involves an additional argument, the causer, i.e. kyuujotai ‘rescue team’ in (43b) and Hanako in (44b). Third, only the causative form entails causation. Thus, while (43b) and (44b) entails that some event or individual caused Taroo to undergo a change of location, nothing causes the change of location undergone by Taroo in (43a) and (44a).

The current analysis of the alternating verbs offers a straightforward account of how these three syntactic realizations of the alternating verbs are related with each other. Under the proposed analysis, the unaccusative form of the alternating verbs involves $v_{\textsc{become}}$ and lacks Voice (45a). The causative form of the same verbs, on the other hand, involves $v_{\textsc{cause}}$. The $v_{\textsc{cause}}$ introduces causation and is embedded under a Voice, which introduces the causer, Hanako (45b). Thus, while the internal argument Taroo is realized
as a nominative-marked derived subject in the unaccusative structure (45a), it remains an internal argument and accusative-marked in the causative structure (45b).

(45) a. Unaccusative

\[
\begin{align*}
\text{TP} & \quad \text{vP} & \quad \text{T} \\
\text{VP} & \quad \text{v} & \quad \text{‘PST’} \\
\text{heya-kara} & \quad \text{V‘BECOME’} \\
\text{TAROO-ga} & \quad \text{V} & \quad \text{d} & \quad \text{‘come out’}
\end{align*}
\]

b. Causative

\[
\begin{align*}
\text{TP} & \quad \text{VoiceP} & \quad \text{T} \\
\text{VoiceP} & \quad \text{v} & \quad \text{‘PST’} \\
\text{Hanako-ga} & \quad \text{Voice ‘PST’} \\
\text{heya-kara} & \quad \text{V‘CAUSE’} \\
\text{TAROO-o} & \quad \text{V} & \quad \text{d} & \quad \text{‘come out’}
\end{align*}
\]

A remaining question is why the alternating verbs have the same morphological form for the unaccusative and transitive structure. We suggest that this has to do with lack morphological markers of “agentivization”, as opposed to causativization, in Japanese. If Japanese has no morphological means of expressing agentivization, then the use of the same forms for the unaccusative and the agentive transitive structure is not surprising.

5.2 On the Membership of the Accusative-Oblique Alternation Verbs

The other implication to be addressed is the question of what determines the membership of the alternating verbs, in face of the fact that a large number of two-place verbs in Japanese do not participate in similar alternations.

Levin (1999) proposes that two-place verbs across languages are classified into two major classes. *Canonical Transitive Verbs* (CTVs) involve a complex causative event
structure and are invariably realized in the canonical transitive structure. *Non Canonical Transitive Verbs* (NCTVs), on the other hand, are defined by lack of a complex event structure, and their syntactic encoding is subject to language specific linking rules. Thus, while complements of CTVs are invariably realized as accusative-marked direct objects in accusative languages, complements of NCTVs can be realized as accusative-marked direct objects or as oblique arguments. Levin suggests that syntactic encoding of complements of NTVCs is determined in a two-step process. If there is a specific linking rule for oblique markings that applies to a given NTV complement, it is realized as an oblique argument. If there is no such rule, a default linking rule realizes it as an accusative marked direct object. The system is illustrated below in (46).

(46)  *Levin’s (1999) model of syntactic encoding of complements of two-place verbs*

```
         TWO-PLACE VERBS
       ↓
 CANONICAL TRANSITIVE EVENT?
     ↓
   Yes                 NO
  ↓
 CTVs                 NCTVs
 ↓
  direct object       AN OBLIQUE LINKING RULE?
    ↓
   Yes                 No
    ↓
  oblique           direct object (BY DEFAULT)
```

Under this model, the fact that the accusative-oblique alternation verbs show the alternation in the complement marking entails that they are NCTVs. The classification of the accusative-oblique alternation verbs as NCTVs is supported by the fact that the alternating verbs do not involve a causative meaning, as discussed in Section 5.1.
However, the accusative-oblique alternation verbs must still be distinguished from the other NCTVs, since not all NCTVs participate in the alternation. For instance, two-place verbs such as mi-ru ‘watch’ and mats-u ‘wait’ are NTCVs as they do not involve a causative event. Yet their complement can only be marked with accusative case.

We argue that the crucial property of the accusative-oblique alternation verbs that distinguishes them from the other NCTVs such as mi-ru ‘watch’ and mats-u ‘wait’ is that they are motion verbs, verbs that denote motion events, and arguments of motion verbs are underspecified for their syntactic realization, unlike other NCTVs like mi-ru ‘watch’ and mats-u ‘wait’ whose subjects must be external arguments. This makes it possible for the alternating verbs to be encoded as unaccusatives or transitives. Under the proposed analysis, therefore, the selection process for the alternating verbs based on Levin’s system would look like (47)

(47)  A mapping of the complement of accusative-oblique alternation verbs

\[
\begin{array}{c}
\text{TWO-PLACE VERBS} \\
\downarrow \\
\text{CANONICAL TRANSITIVE EVENT?} \\
\downarrow \\
\text{Yes} \quad \downarrow \quad \text{No} \\
\downarrow \\
\text{CTVs} \quad \downarrow \quad \text{NCTVs} \\
\downarrow \\
\text{direct object} \\
\downarrow \\
\text{DIRECTED-MOTION/CHANGE OF LOCATION} \\
\downarrow \\
\text{CAN THE SUBJECT BE AN EXTERNAL ARGUMENT?} \\
\downarrow \\
\text{Yes} \quad \downarrow \quad \text{No} \\
\downarrow \\
\text{direct object} \quad \text{oblique}
\end{array}
\]
One important difference between Levin’s model in (46) and the proposed model in (47) is that (46) has no place for the default linking rule that encodes a complement of two-place verb as an accusative-marked direct object. Under (47), accusative-marking of a complement is available only with the presence of an external argument.

Here, it is important to point out that the availability of the alternation is not determined by the aspectual nature of events that these verbs denote, in particular their telicity. Since Tenny’s (1992) influential proposal, many studies have argued that telicity of events plays a deterministic role in variable argument mapping (Borer 1994, 2005; Ritter and Rosen 1998; van Hout 2000a, 2000b, 2004, among others). However, a brief examination of events that the alternating verbs denote shows that telicity does not play a deterministic role in accusative-oblique alternation. Evidence for this claim comes from compatibility of the accusative-source alternation verbs with different time adverbials. They are compatible with temporal adverbials that refer to a time internal (time-span adverbials) such as jup-pun-de ‘in ten minutes’ and mik-kakan-de ‘in three days’, but incompatible with temporal adverbials that refer to the duration of an event (durative adverbials) such as jup-pun ‘for ten minutes’ and mik-kakan ‘for three days’. Importantly, this is the case regardless of the complement marking.  

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10 As an anonymous reviewer points out, the telicity of events denoted by the accusative-goal alternation verbs seems to change between the accusative and the oblique structure.

(i) a. Gakusee-ga  ichi-jikan/ichi-jikan-de  yama-o nobot-ta

    students-NOM one-hour/one-hour-in  mountain-ACC ascend-PST

    ‘The students climbed the mountain for one hour/in one hour.’
The observation that the durative adverbials cannot refer to the events of coming out of a bath and leaving a port regardless of the complement marking suggests that these verbs always denote telic events without duration, i.e. achievements. This suggests that the

b. Gakusee-ga #ichi-jikan/ichi-jikan-de yama-ni nobot-ta
students-NOM #one-hour/one-hour-in mountain-Goal ascend-PST
‘The students climbed on the mountain #for one hour/in one hour.’

The incompatibility of (ib) with the durative adverbial suggests that (ib) can only be telic, unlike (ia). However, it remains to be case that no change in telicity of events is observed with the accusative-source alternation verbs; thus, telicity cannot be the determining factor that accounts for both subtypes of accusative-oblique alternation.
alternation between the transitive and the unaccusative structure that the accusative-source alternation verbs undergo is not driven by telicity of events.

However, the system in (47) still leaves unaccounted for the idiosyncratic nature of the membership for the alternating verbs within motion verbs. Directed motion verbs such as hair-u ‘enter’, tsuk-u ‘arrive’ and ochi-ru ‘fall’ do not undergo the alternation (50), and neither do contact verbs like fure-ru ‘touch’ and butsukar-u ‘collide with’ (51) and change-of-location verbs such as wakare-ru ‘separate’ and dokuritsu su-ru ‘become independent’ (52).

(50) a. Taroo-ga heya-ni/*-o hait-ta
   T-NOM room-GOAL/*-ACC enter-PST
   ‘Taroo entered the room.’

   b. Kodomo-ga kawa-ni/*-o ochi-ta
      child-NOM river-GOAL/*-ACC fall-PST
      ‘A child fell into the river.

(51) a. Futa-ri-no senshu-ga booru-ni/*-o fure-ta
     two-CL-GEN player-NOM ball-GOAL/*-ACC touch-PST
     ‘Two players touched the ball.’

   b. Taroo-ga tsuukoonin-ni/*-o butsukat-ta
      Taroo-NOM passerby-GOAL/*-ACC collide_with-PST
      ‘Taroo bumped into a stranger.’

(52) a. Taro-wa soko-de guruupu-kara/*o wakare-ta
     T-TOP there-LOC group-SOURCE/*ACC separate-PST

55
‘Taroo got separated from the group there.’

b. Amerika-wa igirisu-kara/*o dokuritsu shi-ta
   America-TOP England-SOURCE/*ACC independence do-PST

‘America became independent from England.’

While finer lexical semantic analyses of these verbs might prove that there are principled reasons for why these verbs do not participant in the alternation, we must leave this question for the future research.

6 Conclusion

This paper argued for the existence of an accusative-oblique alternation verbal class subsuming the accusative-goal and accusative-source alternation classes that have been previously identified in the literature. It also presented the first formal account for such alternation(s), according to which the alternating verbs are associated with two different underlying syntactic structures: the transitive structure and the unaccusative structure.

While the alternation is only visible through the two alternative markings of the complement, a new set of empirical data introduced in this paper highlighted systematic semantic and syntactic differences between the alternating verbs in the two alternative structure. These empirical data were obtained by means of carefully controlled experiments with a large number of speakers.

The proposed analysis of the accusative-oblique alternation verbs paints a picture of productive one-to-many mappings between verbs and their syntactic structures with motion verbs, which have been documented across languages (e.g. Perlmutter 1978; Hoekstra and Mulder 1990; Hoekstra 1992; Hale and Keyser 1993, 2002; Sorace 1993,
and argues for the importance of the core lexical semantics of verbs in determination of the syntactic encoding of their arguments (Levin and Rappaport-Hovav 1995; Levin 1999; Zubizarreta and Oh 2007; Ramchand 2008). It also presents evidence against the view that telicity of events plays a deterministic role in variable argument mappings (Tenny 1992; Borer 1994, 2005; Ritter and Rosen 1998; van Hout 2000a, 2000b, 2004, among others). As such, to the extent it is successful, the proposed analysis provides novel arguments for approaches to the lexical semantics-syntax interface according to which the core meaning of verbs and their syntactic structures together construct interpretation of verbs and their arguments.

It is our hope that the empirical data from accusative-oblique alternation verbs in Japanese and our proposed analysis of these alternations as unaccusative-transitive alternations contribute to further development of the research into the mapping between verbs’ meaning and their syntactic structures and inspire more research into the topic.
References


