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VERB-DESCRIPTIVITY OF LEXICAL VERBS AND COMPLEXITY OF CONSTRUCTIONS¹

1 INTRODUCTION

This paper deals with the verb's syntactic realization patterns, as in (1). As demonstrated in (1) and (2), the manner of motion verb *run* has a broad range of applications to syntactic constructions, while the change of state verb *break* has a narrower range of applications. Thus, we can hypothesize that lexical verbs have their own syntactic realization patterns.

- (1) a. Pat *ran*.
b. Pat *ran* to the beach.
c. Pat *ran* herself ragged.
d. Pat *ran* her shoes to shreds.
e. Pat *ran* clear of the falling rocks.
f. The coach *ran* the athletes around the track.
(Rappaport and Levin 1998: 98)
- (2) a. *Kelly *broke*.
b. Tracy *broke* the dishes.
c. *Kelly *broke* the dishes off the table.
d. *The clumsy child *broke* his knuckles to the bone.
e. *Kelly *broke* the dishes into a pile.
(Rappaport and Levin 1998: 103, 117)

According to Rappaport and Levin (1998), verbs that belong to the same class have the same syntactic realization patterns. As demonstrated in (3) and (4), the verbs of surface contact through motion (e.g., *sweep* and *wipe*) have the same syntactic realization patterns.

¹ This paper is based on my study presented at the 158th meeting of the Linguistic Society of Japan and my M.A. thesis submitted to Osaka University in January 2020. I would like to express my gratitude to Sadayuki Okada for his invaluable comments on this paper.

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- (3) The verb *sweep*
 a. Terry *swept*.
 b. Terry *swept* the floor.
 c. Terry *swept* the crumbs into the corner.
 d. Terry *swept* the leaves off the sidewalk.
 e. Terry *swept* the floor clean.
 f. Terry *swept* the leaves into a pile.
 (Rappaport and Levin 1998: 97-98)
- (4) The verb *wipe*
 a. Terry *wiped*.
 b. Terry *wiped* the table.
 c. Terry *wiped* the crumbs into the sink.
 d. Terry *wiped* the leaves off the table.
 e. Terry *wiped* the slate clean.
 f. Terry *wiped* the crumbs into a pile.
 (Rappaport and Levin 1998: 99)

However, there are different data from (3) and (4). The manner of motion verbs *run* and *scurry* have diverse syntactic realization patterns, as indicated in (5). We can say that the verb *run* is easily accepted when applied to a variety of constructions, while the verb *scurry* is difficult for us to accept.

- (5) The verbs *run* and *scurry*
 a. John {*ran* / *scurried*} through the street.
 b. John {*ran* / *scurried*} Mary down the street.
 c. John {*ran* / **scurried*} himself to exhaustion.
 d. John {*ran* / **scurried*} the soles off his shoes.
 e. John {*ran* / *scurried*} his way through the crowd.

Therefore, this paper tries to explain the data in (5) by using the following two ideas: “verb-descriptivity” and “complexity of constructions.” *Verb-descriptivity* refers to the degree of specificity of meanings that verbs denote, which was first presented by Snell-Hornby (1983). *Complexity of constructions* refers to the degree of complexity of constructions, which has not been analyzed previously. However, since we have a problem with respect to the implementation of these ideas, this paper first addresses these issues with verb-descriptivity, and subsequently proposes a hypothesis of the complexity of constructions to account for the data provided in (5).

In addressing this issue, this paper focuses specifically on the relationship between manner of motion verbs (e.g., *run*, *scurry*...) and a variety of constructions that involve motion. Note that we do not deal with other classes of verbs and constructions because of time and space constraints.

The organization of this paper is as follows: Section 2 reviews the discussion of verb-descriptivity and is based on the analysis mentioned in Mima (2019). In addition,

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it offers a preliminary overview of the following sections. Section 3 elucidates the complexity of the constructions and proposes the complexity hypothesis of constructions based on the previous discussion. Section 4 considers the correlation between the degree of verb-descriptivity and the degree of complexity of constructions, with the discussion offering some hints with regard to the understanding of which sentences are more easily acceptable. Finally, Section 5 concludes this paper.

2 VERB-DESCRIPTIVITY OF LEXICAL VERBS

This section reviews the analysis of verb-descriptivity proposed by Mima (2019). In this paper, we first outline some issues with the implementation of verb-descriptivity in a previous study, and subsequently consider the proposal and the research findings presented by Mima (2019).

2.1. Snell-Hornby (1983): Claims and a Generalization of Verb-Descriptivity

The concept of *verb-descriptivity* was first proposed by Snell-Hornby (1983). Snell-Hornby (1983: 24) stresses that Germanic languages such as English and German have descriptive verbs. She claims that descriptive verbs are formed by semantically combining verbs with adjectives and manner adverbs. Consider the manner of the motion verb *dawdle*, for example. As in (6), the verb *dawdle* composes the verbs *walk* and *work*, and the manner adverb *slowly*.

- (6) a. He dawdled.
 b. He walked slowly.
 c. He worked slowly. (Snell-Hornby 1983: 39)

In addition, she claims that descriptive verbs consist of *act-nucleus* (ANu) and *modificants* (Mod), defining ANu as a core of verbal actions and Mod as modifying elements expressed by one or more adjectives and adverbs. Consider the verb *strut* as an example. As demonstrated in (7), we can see that the ANu of the verb is the verb *walk*, and the Mod of the verb is *in a stiff, self-satisfied way*.

- (7) The verb *strut*
 a. ANu: *walk*
 b. Mod: *in a stiff, self-satisfied way*
(adapted from Snell-Hornby 1983: 25)

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Moreover, Snell-Hornby (1983:33) states that the higher the specificity of Mod of verbs, the higher the degree of verb-descriptivity. Consider the contrast in the verbs *hike* and *backpack*, for example. Here, (8a) shows the hierarchy of verb-descriptivity in the verbs *hike* and *backpack*. The degree of verb-descriptivity of the verb *backpack* is higher than that of the verb *hike* because the Mod of the verb *backpack* is more specific than that of the verb *hike*, as in (8b-c).

- (8) a. The hierarchy of the verb-descriptivity in the verbs:
 hike < *backpack*
 b. The verb *hike*:
 walk a long way, as for pleasure or physical exercise (WordNet)
 (ANu + Mod α)
 c. The verb *backpack*:
 walk a long way, as for pleasure or physical exercise with a backpack
 (ANu + Mod $\alpha + \beta$) (WordNet)

Considering these claims, Snell-Hornby (1983) generalizes the verb-descriptivity of lexical verbs, as in (9). The term *verb's range of application* refers to the number of constructions where a verb occurs. In the case where the verb's range of application is broad, it suggests that the number of constructions where a verb can occur is likely to be large. Conversely, in the case where the verb's range of application is narrow, it suggests that the number of constructions where a verb can occur is likely to be small.

- (9) The higher the degree of verb-descriptivity, the narrower the verb's range of application.

However, Snell-Hornby (1983) does not clearly define the requirement for qualifying as an ANu, and hence, cannot demonstrate why the ANu of the verb *strut* is the verb *walk* given in (7). Section 2.2 outlines the proposal for the problem and discusses the research findings.

2.2. Proposal and Analysis

This section outlines the proposal to address the problem with Snell-Hornby's claims. Mima (2019) proposed a semantic relation *troponymy* to address the issue. We can see that the solution could be on the right track from our research findings.

First, let us look at the proposal. Mima (2019) refers to the semantic relation *troponymy* (Fellbaum 1990, 1998), which is defined in (10), while (11) is an example of (10). Note that Fellbaum (1998: 79) considers *manner* to be a very loose category and suggests that "troponyms can be related to their superordinates along many

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semantic relations.”

- (10) a. To V_1 is to V_2 in some particular manner.
 b. V_1 is a troponym of V_2 . (Fellbaum 1990: 285)
- (11) a. To *limp* is to *walk* in some particular manner.
 b. The verb *limp* is a troponym of the verb *walk*.

In addition, Fellbaum (1990: 285-286) says that verbs that satisfy the troponymy relation defined in (10) have the following lexical entailment, as provided in (12a). Meanwhile, (12b) is an example of (12a).

- (12) a. Every troponym V_1 of a more general verb V_2 also entails V_2 .
 b. Every troponym {*limp*...} of a more general verb *walk* also entails *walking*.
 (adapted from Fellbaum 1990: 285-286)

Furthermore, Fellbaum (1990: 286) suggests that the pairs that satisfy the troponymy relation in (10) are also always temporally co-extensive. Thus, we can say that one must necessarily walk in every instant that one is limping. Mima (2019) provides other advantages that we can obtain from the troponymy analysis, but this paper does not deal with them due to space constraints.

Mima (2019) proposes that V_2 in (12a) is an ANu of V_1 . As a consequence, we can consider that the verb *walk* is an ANu of the verb *limp*. In addition, Mima (2019) defines the ANu of verbs as a lexical item rather than as a concept. The proposal will bring us the appropriate findings predicted from Snell-Hornby’s generalization.

Let us analyze the case of the unergative manner of motion verbs and their range of application: (i) *walk*, *hike*, *backpack*, and (ii) *run*, *scurry*, *crab*. The manner of motion verbs refers to a verb class that lexicalizes the two concepts: “motion” and “manner of the action” (Levin 1993, Rappaport and Levin 1998, among others). First, we apply (10a) and (12a) to the verbs, and then ensure that they have the same ANu and that they are aligned in a single order in the hierarchy of verb-descriptivity. Meanwhile, (13) and (14) are the troponymy relations of verbs. Each of the manner descriptions is based on the definition of WordNet.²

- (13) Manner of motion verbs (1) *walk*, *hike*, *backpack*
 a. To *walk* is to *move* in A manner.
 b. To *hike* is to *walk* (= to *move* in A manner) in B manner.
 c. To *backpack* is to *hike* (to *walk* (= to *move* in A manner) in B manner)
 in C manner.

A= *using one’s feet to advance*
 B= *a long way, as for pleasure or physical exercise*

² WordNet is an English lexical database provided by Princeton University, and the troponymy relation is used in structuring WordNet. WordNet is based on the idea that lexical items are stored in our mental lexicon under semantic relation (cf. Miller et al. 1993).

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C= *with a backpack*

d. Every troponym {*run, scurry, crab*} of a more general verb *move* also entails *move*.

(14) Manner of motion verbs (2) *run, scurry, crab*

a. To *run* is to *move* in A manner.

b. To *scurry* is to *run* (to *move* in A manner) in B manner.

c. To *crab* is to *scurry* (to *run* (to *move* in A manner) in B manner) in C manner.

A= *fast by using one's feet*
B= *hurriedly*
C= *sideways like a crab*

d. Every troponym {*run, scurry, crab*} of a more general verb *move* also entails *move*.

From (13) and (14), we can obtain the following hierarchies of the degree of verb-descriptivity, as demonstrated in (15). The verbs *walk* and *run* have a relatively low degree of verb-descriptivity, while the verbs *backpack* and *crab* have a relatively high degree of verb-descriptivity. Therefore, we can see that the degree of verb-descriptivity of these verbs increases from left to right. We can also understand that every verb has the same ANu *move*.³ Consequently, we can say that the verbs form proper hierarchies of verb-descriptivity and all have the same ANu.

(15) a. Manner of motion verbs (1): *walk < hike < backpack*

b. Manner of motion verbs (2): *run < scurry < crab*

Now, let us examine the research findings. Mima (2019) demonstrates the verbs' range of application to Motion Constructions based on the proper verbal descriptive hierarchy of these verbs, as in (16) and (17). This paper focuses on the following constructions: (a) Location PP, (b) Induced Action Alternation, (c, d) Resultative Constructions, and (e) Way Construction.

(16) Manner of motion verbs (1): *walk, hike, backpack*

a. John {*walked / hiked / backpacked*} through the mountain.

b. John {*walked / *hiked / *backpacked*} Mary through the mountain.

c. Cathy {*walked / *hiked / *backpacked*} herself to exhaustion.

d. John {*walked / *hiked / *backpacked*} the soles off his shoes.

e. John {*walked / hiked / backpacked*} his way across Europe.

³ WordNet defines verbs as a "synset," that is, a set of synonyms, and the meaning of a lexical item is described by synsets and its semantic relations to other words (Fellbaum 1990, 1998). According to WordNet, manner of motion verbs have the same ANu (*move, travel, go, and locomote*), which describe a change of location. This paper picks up the verb *move* as the representative.

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- (17) Manner of motion verbs (2) *run, scurry, crab*
- a. John {*ran* / *scurried* / *crabbed*} through the street.
 - b. John {*ran* / *scurried* / *crabbed*} Mary down the street.
 - c. John {*ran* / **scurried* / **crabbed*} himself to exhaustion.
 - d. John {*ran* / **scurried* / **crabbed*} the soles off his shoes.
 - e. John {*ran* / *scurried* / *crabbed*} his way through the crowd.

Meanwhile, (16) and (17) show that the higher the degree of verb-descriptivity, the narrower the verb's range of application. This conforms to Snell-Hornby's generalization provided in (9).

2.3. Summary

In Section 2, we propose a semantic relation *troponymy* to solve the problem of the implementation of the verb-descriptivity. Because of the analysis, we were able to solve the problem and see that the verbs' range of application to constructions is predictable from Snell-Hornby's generalization. However, we will need to verify whether the generalization applies to other verb classes. If the generalization is attested, it will be widespread on verb-descriptivity. In addition, we can suggest that the degree of verb-descriptivity influences the syntactic realization patterns of lexical verbs.

Section 3 analyzes the syntactic realization patterns of lexical verbs from the perspective of the complexity of constructions. We will assume that the degree of complexity of constructions also has an effect on the syntactic realization patterns of lexical verbs, and this paper will present a new hypothesis of the complexity of constructions because of the absence of previous studies.

3 COMPLEXITY OF CONSTRUCTIONS

Recognizing the observation in Section 2, we found two types of constructions: (i) constructions in which many verbs are acceptable (e.g., Location PP and Way Construction) and (ii) constructions where few verbs are acceptable (e.g., Resultative Constructions). In this paper, we assume that constructions such as (i) have a relatively low degree of complexity of constructions, while constructions such as (ii) have a relatively high degree of complexity of constructions. The relationship between these degrees is demonstrated in Table 1.

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Table 1: Relationship between the two degrees in Motion Constructions

Constructions	Degree of <i>Acceptability</i> <i>Judgments of Verbs</i>	Degree of <i>Complexity of</i> <i>Constructions</i>
a. Location PP	High	Low
b. Way Construction	↕	↕
c. Induced Action Alternation	↕	↕
d. Resultative Constructions	Low	High

This paper assumes that the degree of complexity of constructions could influence the syntactic realization patterns of lexical verbs, so we can first establish the following hypothesis of the complexity of constructions, as shown in (18). The term *the acceptability judgments of verbs* refers to the number of verbs that are acceptable in a construction. In the case where the degree of acceptability judgments of verbs is high when applied to a construction, it implies that the number of verbs that are acceptable in the construction is likely to be large. Conversely, in the case where the degree of acceptability judgments of verbs is low when combined with a construction, it suggests that the number of verbs that are acceptable in the construction is likely to be small.

- (18) The lower the degree of acceptability judgments of verbs, the higher the degree of complexity of constructions.

However, (18) poses a question. We have to explain what causes the low degree of acceptability judgments of verbs from the perspective of constructions in which the verbs occur. Sections 3.1 and 3.2 will explore why each Motion Construction has a relative degree of complexity, while Section 3.3 proposes a hypothesis of the complexity of constructions. For the purpose of space, this paper only deals with the two factors in the low degree of acceptability judgments of verbs when combined with constructions, but there might be more factors involved with the issue. We leave them open in this paper.

3.1. Two Factors in the Low Degree of Acceptability Judgements of Verbs when Combined with Motion Constructions

3.1.1. Preliminaries In this section, we will explore what causes the low degree of acceptability judgments of verbs. Before addressing this issue, this paper assumes that the degree of complexity of constructions should be evaluated within the same

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family of constructions. Goldberg and Jackendoff (2004) suggest that constructions share a certain family resemblance, and the characteristics are shown in (19).

- (19) a. “There is a cline of grammatical phenomena from totally general to the totally idiosyncratic.”
 b. “Everything on this cline is to be stated in a common format [...].”
 (Goldberg and Jackendoff 2004: 532)

We take into account (19) when considering the degree in question. Thus, we suppose the following points: (i) whether a construction is general or idiosyncratic within a family of constructions, and (ii) whether or not a common format is preserved that all members of the constructions have. This paper assumes that these points are dependent on the degree of complexity of constructions.

In analyzing the factors in the low degree of acceptability judgments of verbs, we especially focus on both syntactic and semantic schemata of constructions because we assume that these schemata could be involved with the degree of complexity of constructions. We also discuss what events are exhibited in each construction. Based on these perspectives, the following sections will explore the different degrees of acceptability judgments of verbs when applied to Motion Constructions.

3.1.2. Factor 1: Schema-Internal Differences In this section, we compare the schematic representations of the relevant constructions. They are summarized in Table 2, where bold characters refer to additional or changing parts when compared with other schemata. For all the schematic representations, each subscript refers to the correspondence between syntactic arguments and the corresponding semantic arguments. This paper refers to Goldberg (1995) and Goldberg and Jackendoff (2004) in describing representations.

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Table 2: Schema-internal differences in Motion Constructions

Constructions	Syntactic (Syn) and Semantic (Sem) Schemas	Degree of Acceptability Judgments of Verbs
a. Location PP	Syn: NP ₁ V PP ₂ Sem: X ₁ GO Y ₂	High
b. Way Construction	Syn: NP ₁ V Poss way PP ₂ . Sem: X ₁ GO Poss way Y ₂ .	↑ ↓
c. Induced Action Alternation	Syn: NP₁ V NP ₂ PP ₃ . Sem: X₁ CAUSE [Y ₂ GO Z ₃]	
d. Resultative Constructions	Syn: NP₁ V NP ₂ PP ₃ Sem: X₁ CAUSE [Y ₂ BECOME Z ₃]	Low

What we can infer from Table 2 is that the lower the degree of acceptability judgments of verbs when combined with the construction, the more complex the schematic representations of the construction. Given the representation of (a) Location PP (Syn: [NP₁ V PP₂], Sem: [X₁ GO Y₂]) is the common format of Motion Constructions, we can see that there is a gradual rise in the number of units (i.e., arguments or predicates) that a construction needs to change so as to complete the whole structure and meaning (e.g., the phrase *Poss way* in (b) Way Construction, the argument NP₁ (X₁) and the predicate CAUSE in (c) Induced Action Alternation⁵ and (d) Resultative Constructions.⁶) Furthermore, as for (d) Resultative Constructions, the constructions exhibit a change of state event caused by the action denoted by the main verb (=V), and it imposes a restriction on the effect that resultative phrases (or resultative predicates) need to express the resultative states of direct objects (cf. *Direct Object Restriction* in Levin and Rappaport Hovav (1995: 34)). Thus, we can see the change of the subordinating predicate to the predicate BECOME. This point will be discussed in detail in the next section.

In light of this, we can summarize the aforementioned observation, as follows:

⁴ In this paper, *Poss* refers to possessive forms such as *my*, *your*, *his*, *her*, and so forth.

⁵ The reason for claiming the addition of the argument is that Induced Action Alternation always implies the transfer of the internal argument (NP₂ (Y₂)) (Kageyama 2001: 37). Thus, we can say that the common format ([NP₁ V PP₂] / [X₁ GO Y₂]) is preserved regardless of the fact that the numbers in the subscripts are different. Also, it is widely accepted that the external argument (NP₁ (X₁)) brings about an event in which the internal argument (NP₂ (Y₂)) engages, so we can say that the main predicate CAUSE is added.

⁶ The reason for claiming the addition of the argument is that Resultative Constructions always imply the resultative state of the internal argument (NP₂ (Y₂)) (cf. *Direct Object Restriction* in Levin and Rappaport Hovav (1995: 34)). Also, the external argument (NP₁ (X₁)) causes the event with which the internal argument (NP₂ (Y₂)) is involved, so we can say that the main predicate CAUSE is added.

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- (20) The larger the number of units (i.e., arguments or predicates) that a construction needs to change so as to complete the whole structure and meaning, the lower the degree of acceptability judgments of verbs when combined with the construction.

In the next section, we will discuss what events are described in each construction. The discussion will lead us to clarify another factor in the low degree of acceptability judgments of verbs.

3.1.3. Factor 2: Event Description In this section, let us take a closer look at what events are exhibited in each construction. They can be summarized in Table 3, we can see that there is a rise in the number of events expressed in the construction, especially in (c) Induced Action Alternation and (d) Resultative Constructions. This shows that we can obtain two subevents by decomposing the whole events represented in these constructions due to the presence of the main predicate CAUSE. Moreover, we can also see that there is a construction that has a different event interpretation in (d) Resultative Constructions. The other three constructions (i.e., (a) Location PP, (b) Way Construction, and (c) Induced Action Alternation) exhibit physical changes in location events of subjects (causers and causees).⁷ It recognizes that these constructions share the common format ([NP $\subseteq$ V PP₂] / [X₁ GO Y₂]). Specifically, these constructions exhibit a literal event. This paper uses the terms literal and non-literal to explain the differences among the four constructions.

Table 3: Event description in Motion Constructions

Constructions	Event Type	Event Interpretation
a. Location PP	Activity	Physical change of location
b. Way Construction	Activity	Physical change of location
c. Induced Action Alternation	Cause + Activity	Physical change of location
d. Resultative Constructions	Activity + Result	Change of state

⁷ In the case of Induced Action Alternation, we need to take both the causer and the causee into consideration. Folli and Harley (2006: 145) say that this alternation requires two constraints: *cotemporaneity* and *accompanied action*. These constraints impose on the construction an interpretation that both the causer and the causee engage in the same single event. Therefore, we usually interpret *John walked Mary though the mountain* as explicating that both Mary and John are engaged in the same single event. Meanwhile, Davides and Geyskens (1998) state that this alternation has six subtypes of interpretations including ones that both the causer and the causee do not engage in the same single event described by V.

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In this paper, the terms *literal* and *non-literal* are defined as in (21).

(21) *Literal vs. Non-literal*

- a. The terms refer to whether or not an event interpretation that a target construction exhibits is different in kind to that of the most prototypical construction related to the target construction.
- b. If these event interpretations are of the same kind, the target construction describes a *literal* event.
- c. Else, the target construction describes a *non-literal* event.

Considering (21), let us take into account the case of (d) Resultative Constructions. As mentioned earlier, the constructions exhibit a change of state event caused by the action denoted by the main verb. Consider (22), for example.

(22) John walked himself to exhaustion.

- a. Activity event: John walked.
- b. Result event: John became exhausted because of walking too far.

The first subevent in (22a) exhibits an activity event, so we can say that the event interpretation is of the same kind as the most prototypical construction (i.e., (a) Location PP). Thus, we can say that the first subevent is a *literal* event. Conversely, the second subevent in (22b) exhibits a result event. The PP *to exhaustion* denotes John's change of state event, not John's change of location. Consequently, we can suggest that the event interpretation is different in kind from the most prototypical construction (i.e., (a) Location PP). Therefore, we can say that the second subevent is a *non-literal* event. The comparison between (d) Resultative Constructions (i.e., the target construction in (21)) and (a) Location PP (i.e., the most prototypical construction in (21)) can be shown in (23). It also follows from the schematic difference between them (cf. Table 2).

(23) a. Resultative Constructions (= (22))

John walked himself to exhaustion.

Activity Change of state

b. Location PP

John walked through the mountain.

Activity Change of location

In this context, we can suggest that an *event domain interaction* occurs in (d) Resultative Constructions. The event domain interaction refers to a situation where a construction exhibits both literal and non-literal events simultaneously. As stated above, (d) Resultative Constructions exhibit both literal and non-literal events

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concurrently, so we can say that an event domain interaction occurs in the constructions.

In addition, we can report that this event domain interaction is induced by the breakdown of the *semantic* common format of Location PP ([X₁ GO Y₂]). This implies that when the common format shared by the constructions is preserved to a lesser extent, the degree of idiosyncrasy of constructions is likely to be higher. This paper will presume that the degree of idiosyncrasy of constructions could also be relevant to the degree of complexity of constructions.

Let us summarize the discussion above. We can state our findings in (24).

- (24) If an event domain interaction occurs in a construction, the degree of acceptability judgments of verbs when combined with the construction is likely to be low.

Section 3.2 summarizes all the aforementioned observations and presents the whole picture of Motion Constructions. This will be the basis of the complexity hypothesis of constructions that we will propose later.

3.2. Discussion: The Whole Picture of Motion Constructions

This section provides a summary of the characteristics of Motion Constructions. Before considering it, we first need to recall the relationship between the degree of acceptability judgments of verbs and the degree of complexity of constructions. This study determines the degree of complexity of constructions based on the degree of acceptability judgments of verbs. Table 4 shows the relationship between these degrees.

Table 4: Relationship between the two degrees in Motion Constructions

Constructions	Degree of Acceptability Judgments of Verbs	Degree of Complexity of Constructions
a. Location PP	High	Low
b. Way Construction	↕	↕
c. Induced Action Alternation	↕	↕
d. Resultative Constructions	Low	High

Let us summarize the two types of phenomena. We have discussed (i) the schematic differences of constructions and (ii) what events are exhibited in each construction. Table 5 shows a summary of the results. From the table, we can suggest that the more complex the schematic representations of the constructions, the lower

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the degree of acceptability judgments of verbs when combined with the constructions.

Table 5: Two kinds of phenomena in Motion Constructions

Constructions	Phenomena	Degree of Acceptability Judgments of Verbs
a. Location PP	No (Common schema)	High
b. Way Construction	(i) Additions of units within the schema	
c. Induced Action Alternation	(i) Additions of units within the schema	
d. Resultative Constructions	(i) Additions and changes of units within the schema (ii) Change of event type and change in event interpretation	
		Low

Moreover, when considering these phenomena, we have looked at the relationship between (i) whether or not the common format is preserved within the schemata and (ii) the degree of idiosyncrasy of constructions. We have assumed that when the common format shared by constructions is preserved to a lesser extent, the degree of idiosyncrasy of constructions is likely to be higher. Based on previous discussions, we can now suggest that the higher the degree of idiosyncrasy of constructions, the lower the degree of acceptability judgments of verbs, because the breakdown of the common format brings about a wide gap between constructions that have the common format and those that do not. Therefore, we can say that the farther a construction is from the most general construction (i.e., when the common format shared by constructions is preserved to a lesser extent), the lower the degree of acceptability judgments of verbs. The relationship can be summarized as shown in Table 6.

Table 6: Preservation of the common format and idiosyncrasy of constructions

	Preservation of Common Format	Degree of Idiosyncrasy of Constructions	Degree of Acceptability Judgments of Verbs
(i) Schema-internal differences	Preserved (Syn / Sem)	Low	High
(ii) Event domain interaction	(Syn) Preserved (Sem) Not preserved	High	Low

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We propose a complexity hypothesis of constructions based on the discussions above in Section 3.3. So far, this paper presents the hypothesis without analyses of other constructions, so it remains questionable. However, it could be a fundamental hypothesis in surveying relationships among constructions in terms of the degree of complexity.

3.3. *Complexity Hypothesis of Constructions*

This section proposes a hypothesis with regard to the complexity of construction. As mentioned earlier, this paper considers the degree of complexity of constructions to follow from the degree of acceptability judgments of verbs, so we can first establish the following hypothesis.

- (25) The lower the degree of acceptability judgments of verbs, the higher the degree of complexity of constructions.

A question that we can raise in (25) is the factor in the low degree of acceptability judgments of verbs. By elucidating them, we can explore a refined hypothesis of the complexity of constructions.

According to the observations in Motion Constructions, we assume the following two factors in the low degree of acceptability judgments of verbs (i.e., the high degree of complexity of constructions), as demonstrated in (26).

- (26) The two factors in the low degree of acceptability judgments of verbs
- a. The larger the number of units (i.e., arguments or predicates) that a construction needs to change so as to complete the whole structure and meaning, the lower the degree of acceptability judgments of verbs when combined with the construction.
 - b. In the case of an event domain interaction, the degree of acceptability judgments of verbs when combined with the construction is likely to be low.

In addition, we can hypothesize that the degree of acceptability judgments of verbs decreases (i.e., the degree of complexity of constructions increases) from (26a) to (26b), since the degree of idiosyncrasy of constructions increases from (26a) to (26b), as illustrated in Table 6.

The aforementioned discussions can be summarized as follows:

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- (27) Complexity Hypothesis of Constructions
- a. The lower the degree of acceptability judgments of verbs, the higher the degree of complexity of constructions.
 - b. The degree of acceptability judgments of verbs decreases (i.e., the degree of complexity of constructions increases) if any one of the following phenomena occurs in a construction:
 - (i) Schema-internal differences
 - (ii) Event domain interaction
 - c. The degree of acceptability judgments of verbs decreases (i.e., the degree of complexity of constructions increases) from (b- i) to (b- ii).

As mentioned earlier, (27) remains a hypothesis. Therefore, in the next section, we analyze Tough Constructions. If the acceptability judgments of verbs in the constructions conform to the hypothesis mentioned in (27), we can expect that the hypothesis is compatible with a variety of constructions. Let us move on to the discussion of the complexity of Tough Constructions.

3.4. A Case Study: Tough Constructions

This section deals with the constructions presented in (28), which shows that the Tough Construction in (28a) has a higher degree of acceptability judgments of verbs, while Hard Nut Construction in (28b) is less acceptable than Tough Construction. Specifically, the degree of complexity of constructions increases from (28a) to (28b). Table 7 summarizes the relationship between the two degrees. Taking these into consideration, we will discuss the validity of the complexity hypothesis of constructions in Tough Constructions.

- (28) Acceptability judgments of verbs when applied to Tough Constructions
- a. *Tough* Construction:
 - (i) This dog is easy for me to {walk / hike/backpack} with.
 - (ii) This dog is tough for me to {run / scurry/ crab} with.
 - b. *Hard Nut* Construction:
 - (i) This is a tough route to {walk / hike / backpack}.
 - (ii) This is a tough route to {run / *scurry / *crab} on.

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Table 7: Degrees of Tough Constructions

Constructions	Degree of Acceptability Judgments of Verbs	Degree of Complexity of Constructions
a. <i>Tough Construction</i>	High	Low
b. <i>Hard Nut Construction</i>	Low	High

3.4.1. *Schema-Internal Differences* Let us examine the first factor in the low degree of acceptability judgments of verbs in constructions (i.e., the high degree of complexity of constructions): schema-internal differences. Given that Tough Construction is the general construction in the family of Tough Constructions, this factor is involved, as Table 8 demonstrates. The table illustrates that the degree of complexity of constructions in Hard Nut Construction is higher than that in Tough Construction. Let us examine this claim in detail.

Table 8: Schema-internal differences in Tough Constructions⁸

Constructions	Syntactic (Syn) and Semantic (Sem) Schemas	Degree of Acceptability Judgements of Verbs
a. <i>Tough Construction</i>	Syn: NP ₁ be AP _i (for NP ₂) to INF _j Sem: [X ₂ SEM _j Y ₁] be SEM _i	High
b. <i>Hard Nut Construction</i>	Syn: NP ₁ be [(det) A _i N] (for NP ₂) to INF _j Sem: [X ₂ SEM _j Y ₁] be SEM _i (where Y is an instance of N)	Low

The difference between Tough Construction and Hard Nut Construction is the addition of the determiner phrase [(det) A_i N]. We might as well say that the addition allows Hard Nut Construction to have a more detailed interpretation of NP₁ (Y₁) in that Y is an instance of N. The additional change is an instance of (27b- i), so the degree of acceptability judgments of verbs in Hard Nut Construction is lower than that in Tough Construction. Consequently, we can also say that the degree of complexity of constructions in Hard Nut Construction is higher than that in Tough Construction.

With this observation in mind, we can say that the discussion above is in line with that provided in Table 7; Hard Nut Construction has a low degree of acceptability

⁸ In the table, bold characters refer to additional or changing parts when compared with the general schemas.

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judgments of verbs (i.e., a high degree of complexity of constructions). Therefore, we can claim that such schema-internal differences are one of the factors in the low degree of acceptability judgments of verbs (i.e., the high degree of complexity of constructions).

3.4.2. *An Event Domain Interaction* This section discusses (27b- ii): whether an event domain interaction occurs. There is little to be said on this point in Tough Constructions because the event interpretations of the target construction (e.g., Hard Nut Construction) and the prototypical construction related to the target construction (e.g., Tough Construction) are of the same kind. Thus, we can say that their event interpretations are literal. This paper deals only with Motion Constructions and Tough Constructions, so it is not clear whether other constructions that are relevant to the present topic are available. Depending on the characteristics of construction, there could be a need to discuss whether such an interaction occurs.

3.4.3. *Discussion: The Whole Picture of Tough Constructions* This section presents a summary of the characteristics of Tough Constructions. The two kinds of phenomena in the constructions, (i) schema-internal differences and (ii) an event domain interaction, as summarized in Table 9. This will lead us to the issue of the degree of idiosyncrasy of constructions affecting the degree of acceptability judgments of verbs and the degree of complexity of constructions.

Table 9: Two kinds of phenomena in Tough Constructions

Constructions	Schema-Internal Differences	Event Domain Interaction
a. <i>Tough Construction</i>	No	No
b. <i>Hard Nut Construction</i>	Yes	No

The relationship of the three degrees, (i) the degree of idiosyncrasy of constructions, (ii) the degree of acceptability judgments of verbs, and (iii) the degree of complexity of constructions, is summarized in Table 10. First, there is a rise in the degree of idiosyncrasy of constructions from Tough Construction to Hard Nut Construction. Next, it brings us to the observation that the degree of acceptability judgments of verbs decreases from Tough Construction to Hard Nut Construction. Finally, we can say that there is a rise in the degree of complexity of constructions from Tough Construction to Hard Nut Construction. Therefore, we can say that the complexity hypothesis of constructions given in (27) could be on the right track.

Table 10: Relationship between the three degrees in Tough Constructions

Constructions	Degree of <i>Idiosyncrasy of Constructions</i>	Degree of <i>Acceptability Judgments of Verbs</i>	Degree of <i>Complexity of Constructions</i>
a. <i>Tough</i> Construction	Low	High	Low
b. <i>Hard Nut</i> Construction	High	Low	High

3.5. Summary

Section 3 deals with the complexity of the construction. Little attention has been given to this idea, so we analyzed it based on the acceptability judgments of manner of motion verbs when applied to Motion Constructions. Consequently, we found the characteristics of constructions that various verbs exhibit. From the characteristics observed in Motion Constructions, we proposed a complexity hypothesis of constructions. The hypothesis was compatible with the acceptability judgments of verbs when applied to Tough Constructions, so we assume that the hypothesis is accurate. However, we cannot verify the validity of this hypothesis, without further investigations. If it is compatible with the acceptability judgments of verbs when combined with other constructions, it will be a vital hypothesis in investigating the complexity of constructions. Furthermore, we can suggest that the degree of complexity of constructions influences the syntactic realization patterns of lexical verbs.

Section 4 discusses the correlation between the degree of verb-descriptivity and the degree of complexity of constructions mentioned in the previous sections. This discussion will help analyze which sentences are more easily accepted than others.

4 VERB-DESCRIPTIVITY AND COMPLEXITY OF CONSTRUCTIONS

This section discusses the correlation between the degree of verb-descriptivity and the degree of complexity of constructions. In the previous sections, we presented a generalization of verb-descriptivity and the complexity hypothesis of constructions. They can be summarized as follows:

VERB-DESCRIPTIVITY OF LEXICAL VERBS AND COMPLEXITY OF CONSTRUCTIONS

- (29) Verb-descriptivity:
- a. Low: The verb's range of application is likely to be broad.
(i.e., the number of constructions where a verb can occur is large).
 - b. High: The verb's range of application is likely to be narrow.
(i.e., the number of constructions where a verb can occur is small).
- (30) Complexity of constructions:
- a. Low: The degree of acceptability judgments of verbs is likely to be high
(i.e., the number of verbs that are acceptable in a construction is large).
 - b. High: The degree of acceptability judgments of verbs is likely to be low
(i.e., the number of verbs that are acceptable in a construction is small).

This paper assumes that there can be a correlation between these degrees with respect to the acceptability judgments of verbs,⁹ as demonstrated in Table 11. The table suggests that the lower the degree of verb-descriptivity, or the degree of complexity of constructions, the higher the degree of acceptability judgments of the whole sentences.

Table 11: Correlation between the degrees of verb-descriptivity and complexity

	Descriptivity: High	Descriptivity: Low
Complexity: High	Acceptability: Low (*) ¹⁰	Acceptability: High (✓)
Complexity: Low	Acceptability: High (✓)	Acceptability: High (✓)

Effectively, our data support this suggestion. The contrast between the Resultative Constructions and Location PP could be a notable example, as shown in (31). In the case of Resultative Constructions that have a relatively *high* degree of complexity of constructions, only a relatively *low* descriptive verb *run* is acceptable. Meanwhile, in the case of Location PP, which has a relatively *low* degree of complexity of constructions, both relatively *low* and *high* descriptive verbs *run*, *scurry*, and *crab* are acceptable.

⁹ This paper considers the degree of verb-descriptivity, the degree of complexity of constructions, and the degree of acceptability judgments of verbs to be tendencies, because it is difficult to define their levels of degree clearly due to the differences in each domain.

¹⁰ [*] means that the sentence tends to be unacceptable. In contrast, [✓] means that the sentence tends to be acceptable.

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- (31) Motion Constructions:
- a. Resultative Constructions
 - (i) John *ran* himself to exhaustion.
 - (ii) John { **scurried* / **crabbed* } himself to exhaustion.
 - b. Location PP
 - (i) John *ran* through the mountain.
 - (ii) John { *scurried* / *crabbed* } through the mountain.

Similarly, we can report such a correlation in Tough Constructions. Take the contrast between Hard Nut Construction and Tough Construction. Here, (32) illustrates the same tendency as in the case of Motion Constructions, so the correlation could be widely accepted in discussing the acceptability judgments of the whole sentences in terms of verb-descriptivity and the complexity of constructions.

- (32) Tough Constructions:
- a. *Hard Nut* Construction
 - (i) This is a difficult route to *run* on.
 - (ii) This is a tough route to { **scurry* / **crab* }.
 - b. *Tough* Construction
 - (i) John is tough for me to *run* with.
 - (ii) John is tough for me to { *scurry* / *crab* } with.

However, as mentioned previously, since only two types of constructions have been analyzed in this paper, we will need to examine cases of other constructions. If the observation shown in Table 11 is attested in other constructions, it will provide a comprehensive understanding of which sentences become more acceptable.

5 CONCLUSION

This paper deals with the syntactic realization patterns of lexical verbs. We focus on the analyses of the manner of motion verbs employed in Motion and Tough Constructions. Accordingly, we assumed that both verbs and constructions have a degree of complexity, and we presented the generalization of verb-descriptivity and the complexity hypothesis of constructions. Thus, we can claim that both the verb-descriptivity and the complexity of constructions influence the syntactic realization patterns of lexical verbs. Moreover, this study could capture the reasons why the acceptability judgments of verbs vary depending on constructions and provide an understanding of which sentences become more acceptable. They will provide new insight into the field of research on lexical semantics and syntax-lexical semantics interface.

However, this study analyzed only a few verbs and constructions, so we will need

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further investigations about the generalization of verb-descriptivity and the complexity hypothesis of constructions. If they are maintained when they are applied to other verb classes and constructions, and if the acceptability judgments of the whole sentences are compatible with our observation given in Table 11, this paper will truly be a fundamental study on the syntactic realization patterns of lexical verbs in terms of the degree of complexity.

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