

The Postpositional hierarchy and its  
mapping to clause structure in  
Japanese

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# Acknowledgments

The other day, I was sitting in the living room and watching my five year old son, Ken, building a Lego house. He wanted to make one with a gable roof. Apparently, it was not easy for him to do so on his first attempt. After repeated trial and error, he made one he liked. Meanwhile, he seemed to have learnt a methodology.

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# Chapter 1

## Introduction

It can be observed that the relative order of modifier PPs in Japanese is free. Consider the sentences with a Temporal PP (Temp PP), a Locative PP (loc PP) and an Instrumental PP (Inst PP) in (1). The sentences in (1) allow six different orders among the three modifier PPs without changing the logical meaning of the sentence.

- (1) a. Taro-ga [*Temp* nichiyoo-ni] [*Loc* uraniwa-de] [*Inst* ono-de]  
Taro-NOM Sunday-TEMP backyard-LOC ax-INST  
ki-o kitta.  
tree-ACC cut  
'Taro cut a tree with an ax in the backyard on Sunday.'
- b. Taro-ga [*Temp* nichiyoo-ni] [*Inst* ono-de] [*Loc* uraniwa-de]  
Taro-NOM Sunday-TEMP ax-INST backyard-LOC  
ki-o kitta.  
tree-ACC cut  
'Taro cut a tree in the backyard with an ax on Sunday.'
- c. Taro-ga [*Loc* uraniwa-de] [*Temp* nichiyoo-ni] [*Inst* ono-de]  
Taro-NOM backyard-LOC Sunday-TEMP ax-INST  
ki-o kitta.  
tree-ACC cut  
'Taro cut a tree in the backyard on Sunday with an ax.'
- d. Taro-ga [*Loc* uraniwa-de] [*Inst* ono-de] [*Temp* nichiyoo-ni]  
Taro-NOM backyard-LOC ax-INST Sunday-TEMP  
ki-o kitta.  
tree-ACC cut  
'Taro cut a tree in the backyard with an ax on Sunday.'
- e. Taro-ga [*Inst* ono-de] [*Temp* nichiyoo-ni] [*Loc* uraniwa-de]  
Taro-NOM ax-INST Sunday-TEMP backyard-LOC  
ki-o kitta.  
tree-ACC cut

- ‘Taro cut a tree in the backyard on Sunday with an ax.’
- f. Taro-ga [*Inst* ono-de] [*Loc* uraniwa-de] [*Temp* nichiyoo-ni]  
 Taro-NOM ax-INST backyard-LOC Sunday-TEMP  
 ki-o kitta.  
 tree-ACC cut  
 ‘Taro cut a tree on Sunday in the backyard with an ax.’

Given the standard assumption that the word order in Japanese can be rearranged by scrambling, two questions arise with regard to the ordering of the modifiers in (1). Is the word order of these modifiers constrained? And how are the modifier PPs introduced into a clause structure?

There are at least two potential answers to these questions. The first possible answer is that the order of modifier PPs is not constrained and that the modifier PPs can be freely adjoined to a syntactic structure. This approach corresponds to more traditional adjunction analyses of adverbials (e.g., Ernst 2002, etc).

The second possible answer is that modifier PPs are base-generated in unique positions. A movement operation like scrambling changes their word order in the surface structure. This answer is consistent with the theories of a fine-grained sequence of functional heads, in which adverbials are licensed by a featural relationship to the rigidly ordered heads (e.g., Alexiadou 1997, Cinque 1999; 2006).

This thesis investigates the word order of modifier PPs in Japanese. The goals of the thesis are two-fold. The first is to argue that the underlying order of modifier PPs in Japanese is rigid. On the basis of empirical observation, I will argue that modifier PPs are generated in a hierarchical fashion. Once the hierarchy of the modifier PPs is determined, I will show how the hierarchy supports the theories of a fine-grained functional sequence over the traditional free adjunction analyses.

The theories of functional sequence in the literature, however, have not yet made clear which heads are responsible for the different PP types in a fine-grained hierarchy. The second goal of the thesis, therefore, is to investigate the mapping of the PP hierarchy onto a clause structure. On the basis of compositionality scope tests, I will argue that there is a fine-grained correlation between different PP types and functors such as Aspect and Modal in the middle field. The results of this investigation will clarify where exactly PP modifiers are located in the fine-grained hierarchy of the middle field.

The structure of this thesis is as follows: I take Cinque’s (1999, 2006) cartographic approach as a starting point to my analysis of modifier PPs, and therefore start Chapter 2 by presenting his theory. Then, in the rest of the chapter, I give brief summaries of selected previous approaches to modifier PPs. I first present Larson’s (1988) VP-shell analysis which argues that modifier PPs are generated as thematic arguments of the verb, at the bottom of

the VP-shell. The VP-shell analysis is criticized by Pesetsky (1995) due to the empirical problems it contains, namely, that it cannot account for either constituency facts or binding facts. Pesetsky's alternative to the VP-shell analysis is then presented. Following that, I outline three approaches that argue that modifier PPs are generated above VP. The three approaches described are Barbiers (1995), Nilsen (1998) and Ernst (2002). Lastly, I summarize Schweikert's analysis of PP modifiers in German, whose methodology I adopt in order to find the underlying order of PPs in Japanese.

In Chapter 3, I apply three diagnostics from Schweikert (2005) to Japanese modifier PPs. The three diagnostics include a focus neutral order test, an informational focus test, and a quantifier scope test. These diagnostics are applied to all possible combinations of different modifier PP types in Japanese. The results of each test suggest a consistent and transitive base order for the PPs. Based on the results of the diagnostics, I argue that there is a hierarchy of modifier PPs in Japanese. This hierarchy conforms to the one proposed by Schweikert, giving support to his analysis of structure of PPs.

I continue in Chapter 4 with an investigation of the mapping of the resulting PP hierarchy onto clause structure in Japanese. As a methodology, I adopt a compositionality scope test, which helps me determine how different modifier PP types interact with different functors such as Aspect and Modal. The results of the compositionality scope test indicate that the modifier PPs are located in the relatively large area between the Modal and Aspect domains. To be more specific, the highest PPs of the PP hierarchy can appear in both the Modal and Aspect domains, whereas the lowest PPs must be in the lowest positions of the Aspect domain. The findings from this chapter strongly suggest that there is a fine-grained correlation between PP types and functors of the middle field.

Lastly, chapter 5 attempts to give an outline of a potential analysis for the distributional properties of the modifier PPs discovered in the investigation in Chapter 4. My suggestion is that modifier PPs are generated in the lower positions in the Aspect domain and that some of them can undergo scope movement to the higher Aspect and the Modal domain. This movement changes the scope relations between the PPs and the Aspect and Modal functors. If this analysis is correct, the fine-grained correlation between the PPs and the observed functors can be attributed to scope movement of the PPs.



# Chapter 2

## Previous studies

### 2.1 Theoretical background

In main stream Syntax, it is assumed that complements and modifiers are introduced into the sentence in different manners. By assumption, complements are assigned theta roles by lexical heads and are hence built into the sentence by subcategorization. Unlike complements, modifiers are assumed to be assigned no theta roles. They are not therefore introduced into the sentence by subcategorization but are merely “added” to the sentence by adjunction, which is an unconstrained operation by assumption.

Recently, linguists have been arguing against the adjunction approach to modifiers (Laenzlinger 1998, Cinque 1999, 2006, Schweikert 2005). Cinque (1999, 2006) conducted a cross-linguistic study of adverbial modifiers and concluded that adverbs are base-generated in a rigid order. This conclusion led Cinque to propose that UG defines the hierarchy of functional projections in clause structure and that this hierarchy can be characterized in cartographic terms. In his cartographic approach, each adverb modifier is base-generated in a designated specifier position of a functional projection of the universal hierarchy (cf. for a Cartographic approach, also Belletti 2004, Rizzi 2005). Cinque’s (1999, 2006) universal hierarchy of modifiers is schematized in (1).

- (1) [*Moodspeechact* frankly [*Moodevaluative* fortunately [*Moodevidential* allegedly [*Modepistemic* probably [*T(Past)* once [*T(Future)* then [*Moodirrealis* perhaps [*Modnecessity* necessarily [*Modpossibility* possibly [*Asphabitual* usually [*Asprepetitive(I)* again [*Aspfrequentative(I)* often [*Modvolitional* intentionally [*Aspcelerative(I)* quickly [*T(Anterior)* already [*Aspterminative* no longer [*Aspcontinuative* still [*Aspperfect* always [*Aspretrospective* just [*Aspproximative* soon [*Aspdurative* briefly [*Aspgeneric/progressive* characteristically [*Aspprospective* almost [*AspSgCompletive(I)* completely [*AspPlCompletive* tutto [*Voice* well [*Aspcelerative(II)* fast/early [*Asprepetitive(II)* again [*Aspfrequentative(II)* often [*AspSgCompletive(II)* com-

pletely]

The modifier hierarchy in (1) consists of functional elements that include Mood, Tense, Aspect, and Modal, which Cinque proposes to locate between the CP layer and the VP.

### 2.1.1 Cinque (1999; 2006)

In this thesis, I will investigate the structure of modifier PPs in Japanese within the Cartographic approach developed by Cinque (Cinque 1999; 2006). This chapter therefore first presents a short summary of his proposal that there is a universal hierarchy of functional projections. Then, section 2 summarizes selected previous works on the structure of modifier PPs. The works that are presented in section 2 are Larson's (1988) VP-shell analysis, Pesetsky's (1995) cascade structure, Barbiers' (1995) predicational approach, Nilsen's (1998) reduced relative clause analysis, Ernst's (2002) semantic approach and Schweikert's (2005) PP hierarchy.

#### Cinque 1999, 2006

In his cross-linguistic study, Cinque (1999) investigates the word order of adverbs in Romance languages, Hebrew, Chinese, Albanian, Bosnian/Serbo-Croatian, Norwegian, etc. He observes that cross-linguistically adverbs exhibit the same rigid word order. For example, a speech act Mood adverb like 'frankly' or 'honestly' must precede an evaluative Mood adverb like 'unfortunately', which in turn must precede an evidential Mood adverb like 'evidently'. Examples from Norwegian (2), Bosnian/Serbo-Croatian (3) and Chinese (4) follow.

#### (2) Norwegian

- a. Per forlater *ærlig talt heldigvis* nå selskapet.  
Peter leaves honestly spoken fortunately now party.the  
'Per is honestly fortunately now leaving the party.'
- b. \*Per forlater *heldigvis ærlig talt* nå selskapet.  
Peter leaves fortunately honestly spoken now party.the  
'Per is fortunately honestly now leaving the party.' (Cinque 1999:34)

#### (3) Bosnian/Serbo-Croatian

- a. Iskreno, ja nazžalost imam jako loš mišljenje o vama.  
frankly, I unfortunately have very bad opinion of you  
'Frankly, I unfortunately have a very bad opinion of you.'
- b. \*Nazžalost, ja iskreno imam jako loš mišljenje o vama.  
unfortunately, I frankly have very bad opinion of you  
'Unfortunately I frankly have a very bad opinion of you.' (Cinque 1999:36)



- (4) Chinese
- a. Laoshi-shuo wo buxing            dui tamen you pian-jian.  
honestly I unfortunately to them have prejudice  
'Honestly I unfortunately have prejudice against them.'
  - b. \*Buxing            wo laoshi-shuo dui tamen you pian-jian.  
unfortunately I honestly to them have prejudice  
'Unfortunately I honestly have prejudice against them.'

Note that the translations show that, in English, the second order is also ungrammatical, suggesting that English exhibits the same order restriction. The examples above thus strongly suggest that these adverbs appear in the following hierarchical fashion:  $\text{Mood}_{\text{SpeechAct}} > \text{Mood}_{\text{Evaluative}} > \text{Mood}_{\text{Evidential}}$ . From these rich cross-linguistic data, Cinque draws the conclusion that there is a unique canonical order of adverbs for all languages.

Furthermore, Cinque conducts a cross-linguistic study of affix ordering and observes that languages with suffixes also exhibit a rigid order among certain morphemes. For example, in Korean, an evaluative morpheme must appear to the left of a speech act morpheme (and hence closer to the verb root), while an evidential morpheme must appear to the left of the evaluative morpheme. Given the Mirror Principle (Baker 1985), Cinque uses the order of suffixes to motivate a particular ordering of functional heads (Pollock 1989, Belletti 1990) and accordingly, argues that this morpheme order provides evidence for the order of functional heads  $\text{Mood}_{\text{Evaluative}} > \text{Mood}_{\text{Evidential}}$ . By careful study of the agglutinative affixes in various unrelated languages including Korean, Turkish, Una, Tauya and Chinese, Cinque arrives at the conclusion that the different orders of functional heads motivated for each language is in harmony with the others.

By comparing the independently established hierarchy of adverbs with the hierarchy of affixes, Cinque discovers that there are some striking correspondences between the two hierarchies. The correspondences, in many cases, can be translated into a transparent specifier-head relationship between a certain class of adverbs and an affix class in a systematic one-to-one fashion.

Based on the correspondences, Cinque (1999; 2006) proposes that there is a single order of modifiers for all languages, which is presented in the introduction of the present chapter (1).

In his theory, Cinque argues that free functional morphemes appear in the specifier position of unique functional projections, whereas bound morphemes appear in the head position of unique functional projections. Thus, each adverb class appears in a designated specifier position of a functional head, entering into a spec-head relation with the head. For example, Mood adverb appears in the specifier position of MoodP, entering into a spec-head relation with the Mood head. On the other hand, a Mood suffix appears in the head position of a MoodP, entering into a spec-head relation with its specifier.

An empirical argument for this “Adverb-in-Spec” analysis comes from the relative order of adverbs in relation to the distribution of past participles and finite verbs in Italian. In (5), an active past participle *rimesso* ‘put’ can precede each adverb in the sequence.

- (5)
- a. Da allora, non hanno **rimesso** di solito mica più sempre completamente tutto bene in ordine.
  - b. Da allora, non hanno di solito **rimesso** mica più sempre completamente tutto bene in ordine.
  - c. Da allora, non hanno di solito mica **rimesso** più sempre completamente tutto bene in ordine.
  - d. Da allora, non hanno di solito mica più **rimesso** sempre completamente tutto bene in ordine.
  - e. Da allora, non hanno di solito mica più sempre **rimesso** completamente tutto bene in ordine.
  - f. Da allora, non hanno di solito mica più sempre completamente **rimesso** tutto bene in ordine.  
*since then, neg have usually not.at.all longer always completely put everything well in order*  
 ‘Since then, they haven’t usually any longer always put everything well in order.’ (Cinque 1999: 45)

Assuming that adverbs occupy fixed positions and that verbs move (cf. Pollock 1989), the word order pattern in (5) suggests that there is a position for the head to the left of each adverb position. Under this approach, different word orders in (5) are the result of movement of the past participle over one or more adverbs.

This “Adverb-in-Spec” approach is superior to a traditional adjunction approach since it provides answers to the following questions: (i) how is the rigid order of adverbs explained, (ii) how is the rigid order of affixes explained? and (iii) what is the relationship between the two orders? Under the traditional adjunction theory, which often claims adjunction to be a free operation, the rigid order among the adverbs could not be accounted for without additional stipulations. Furthermore, the adjunction approach does not seem to give a simple account for the word order variation between adverbs and past participles or finite verbs in Italian.<sup>1</sup>

Cinque’s approach, on the other hand, gives straightforward answers to the above three questions. Adverbs are manifestations of functional projections

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<sup>1</sup>An alternative approach to the word order variation between the heads and the adverbs can be found in Keyser (1968). Keyser (1968) proposes Transportability theory, under which adverbs in a language like English are specified as [+Transportable] constituents and therefore can appear quite freely. This approach, however, cannot account for the fact that the adverb order is restricted.

which are base-generated in a hierarchical fashion, hence their order is strictly restricted. Affixes, on the other hand, are manifestations of the functional heads, and accordingly, also appear in a rigid order. Under his theory, two previously unrelated sequences of functional elements, the universal ordering of adverbs and that of inflectional morphemes, are successfully related to each other. All this is done by postulating one underlying syntactic hierarchy in which adverbs and affixes enter into a spec-head relation.

A further advantage to his approach is that it explains why adverbs do not interfere with head movement and may undergo topicalization and focus movement; adverbs are assumed to be XPs in the specifier position of their respective heads.

## 2.2 Previous works on preposition ordering

This section presents selected previous works on PPs. I will first present Larson's (1988) VP-shell analysis, in which modifier PPs are generated in lowest VPs, and then some problems with his analysis. The following subsection presents Pesetsky's (1995) unique theory of cascade structure which gives a solution to the problems of the VP-shell analysis proposed by Larson. Then, I present three approaches, Barbiers' (1995) Principle of Semantic Interpretation, a relative clause approach to PPs by Nilsen (1998), and a semantic approach by Ernst (2002). Although these three approaches have different assumptions with respect to the base structure of PPs and the derivation of the surface order of the PPs, they have the following view in common: different PP types are correlated with syntactic units of different sizes. Lastly, Schweikert's (2005) theory of the PP hierarchy is presented.

### 2.2.1 Larson (1988)

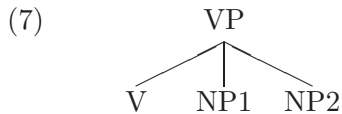
Larson (1988) proposes that modifier PPs are generated at the very bottom of a strictly binary branching layered VP-structure. His theory is very insightful in the sense that it eliminates a flat structure and derives both a double object construction and an oblique dative construction from a unique underlying structure. I will therefore give a short description of how these two constructions are derived in his theory.

Larson's initial motivation for the VP-shell structure comes from Barss and Lasnik's (1986) observation of double object constructions. Barss and Lasnik (1986), observe a number of asymmetries in the behavior of the two objects in double object constructions with respect to c-command relations. They have examined various syntactic phenomena in which c-command plays a crucial role in licensing anaphors, quantifier-pronoun binding, Weak Cross-Over

effects, negative polarity etc, and discovered that in double object constructions, NP<sub>c</sub> commands NP<sub>2</sub>, but not vice versa. The example of licensing of anaphors is illustrated in (6).

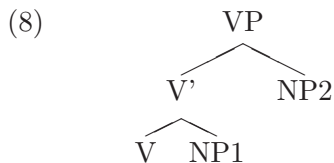
- (6) a. I showed Mary<sub>i</sub> herself<sub>i</sub>.  
 b. \*I showed herself<sub>i</sub> Mary<sub>i</sub>.

The only difference between (6a) and (6b) is the position of the NP<sub>1</sub>, *Mary*, and the NP<sub>2</sub>, *herself*. Since (6a) is perfectly fine, it is assumed that the antecedent *Mary* successfully c-commands the anaphor *herself*. On the other hand, the ungrammaticality of the sentence in (6b) is straightforwardly explained if the antecedent fails to c-command the anaphor. All other data sets of Barss and Lasnik point to the same conclusion. In a double object construction “V NP<sub>1</sub> NP<sub>2</sub>”, NP<sub>1</sub> c-commands NP<sub>2</sub>, whereas the NP<sub>2</sub> does not c-command the NP<sub>1</sub>. From this conclusion, two structural analyses of double object constructions are excluded. One is the flat structure analysis of Oehrle (1976) in which both NP<sub>1</sub> and NP<sub>2</sub> are sisters of the verb, as illustrated in (7).



In this flat structure, NP<sub>1</sub> and NP<sub>2</sub> are in a mutual c-command relation. This structure incorrectly predicts that (6b) is grammatical.

The second analysis that is eliminated is the right-adjoined structure proposed by Chomsky (1981).



In this structure, NP<sub>2</sub>, which is right-adjoined to the verb asymmetrically c-commands NP<sub>1</sub> which is a sister to the verb. Similar to (7), the analysis wrongly predicts (6b) to be grammatical. Thus the two potential analyses are excluded based on Barss and Lasnik’s observation.

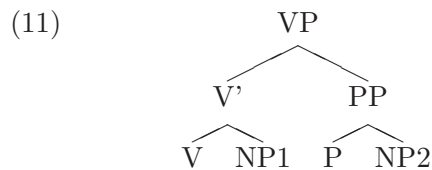
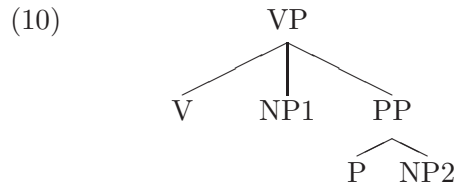
Larson observes that oblique dative constructions pattern with double object constructions in terms of the syntactic tests discussed by Barss and Lasnik’s (1986). Consider an example of anaphor binding from Larson (1988) which illustrate this point.

- (9) a. I showed Mary<sub>i</sub> to herself<sub>i</sub>. (Larson 1988: 338)  
 b. \*I showed to herself<sub>i</sub> Mary<sub>i</sub>. (Larson 1988: 338)

The contrast between (9a) and (9b) indicates that in oblique dative construc-

tions, NP1 asymmetrically c-commands NP2.

Let us now consider two potential structures for oblique dative constructions. Unlike double object constructions, the flat structure in (10) and the right-adjoined structure in (11) do not raise c-command problems for oblique dative constructions.



In both (10) and (11), NP1 c-commands NP2, but NP2 does not c-command NP1 due to the intervening PP node.<sup>2</sup>

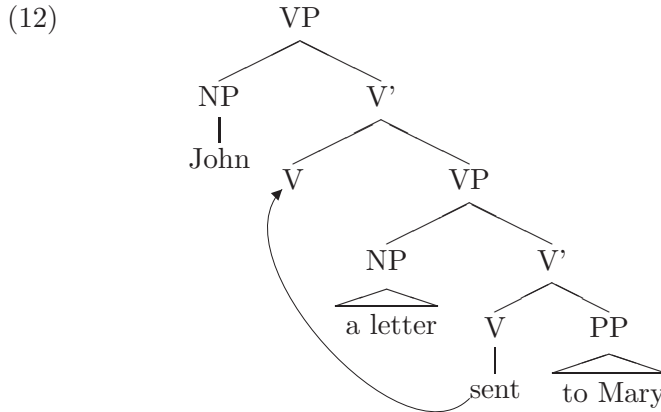
If one assumes that the structural difference between a double object construction and an oblique dative construction is merely the presence of the PP node, the parallel behavior of the two constructions with respect to c-command presents a puzzle. On the one hand, that the oblique dative construction displays c-command asymmetries between NP1 and NP2 is expected. NP 2, which is embedded under PP, fails to c-command NP1 due to the intervening PP node. On the other hand, in a double object construction in which such intervening PP node is absent, the two NPs are expected to show a mutual c-command relation. As seen in (6b), however, this is not the case.

To solve this puzzle, Larson proposes that a double object construction is derived from an oblique dative construction which is argued to have a VP-shell structure. The next paragraphs briefly summarize Larson's VP-shell analysis.

Larson (1988) proposes that in an oblique dative construction, a PP is inserted in the lower VP shell and is therefore c-commanded by the verb and a theme arguments. Under his proposal, an oblique dative construction like *John sent a letter to Mary* will be assigned the base-structure illustrated in (12).

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<sup>2</sup>For (11), Larson adopts the definition of c-command proposed by Aoun and Sportiche (1983).



The ditransitive verb *sent* is generated in the lowest head V position. It takes an oblique PP *to Mary* as its complement, forming a predicate in the sense of Chomsky (1957).<sup>3</sup> This string *sent to Mary* is predicated of *a letter* which occupies the specifier position of the verb, constituting the lowest VP projection. The resulting VP *a letter sent to Mary* is predicated of an external argument *John* which is placed in the specifier of the higher verb, constituting the highest VP. Larson further argues that the verb *sent* undergoes head-movement to the highest V position, resulting in the correct word order. This head-movement is motivated by (i) the theta-role assignment for the NP *a letter*, and (ii) the need for establishing the Infl-V relation. Following Roberts (1985), V must head a projection governed by Infl in order to receive tense and agreement information. A V-movement analysis makes it possible for the verb to form an Infl-V relationship and to assign a theme role to the NP object *a letter*.

Under this analysis, the direct object c-commands the oblique dative object, but not vice versa. The analysis, therefore, gives a straightforward ac-

<sup>3</sup>Chomsky (1955/1975) proposes that an oblique dative construction like *give a letter to Mary* has a base-structure where the PP *to Mary* is sister to the verb and the NP *a letter* is right-adjoined to the projection.

(i)  $[_{VP} [\text{give } [_{PP} \text{to Mary} ] ] [_{NP} \text{a letter} ] ]$

Under this approach, the surface order *give a letter to Mary* is derived by extraposition of the PP *to Mary* to the right-adjoined position of the higher projection. The relationship between the direct object and the verb and the one between the verb and the indirect object in this approach is, in effect, the inverse of the corresponding relations in the approaches (10) and (11). In (11) the direct object but not the indirect object is sister to the verb, and in (10) the direct object and the indirect object are sisters to the verb. In Chomsky's approach, however, the indirect object but not the direct object is sister to the verb. Inspired by this view, Larson (1988) asserts that the verb takes the indirect object as its argument and assigns the theta-role to it. The direct object, on the other hand, is given its theta-role compositionally by the V'.

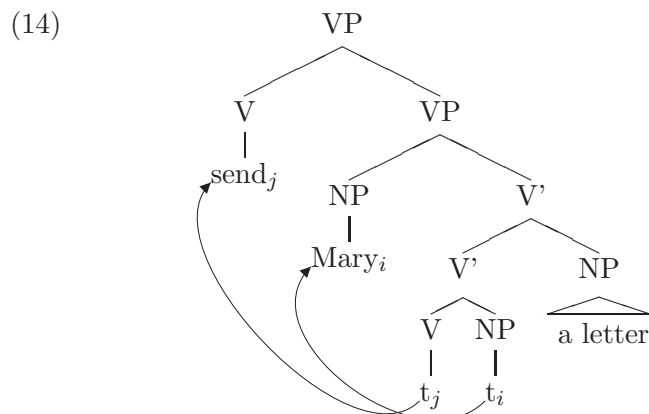
count to a series of facts in terms of asymmetric c-command relations between the direct object and the oblique dative object observed in Barss and Lasnik (1986).

In support of his theory, Larson presents coordination facts. Consider the example in (13), in which a coordinator intervenes between the two sets of complements *a letter to Mary* and *book to Sue*.

(13) John sent [a letter to Mary] and [book to Sue]. (Larson 1988:345)

It is standardly assumed that only constituents are coordinated. Under the flat structure analysis in (10) and the right-adjunction analysis in (11), the two sets of complements *a letter to Mary* and *book to Sue* do not form constituents. These analyses therefore incorrectly predict that the sentence in (13) is ungrammatical. On the other hand, in a VP-shell analysis with verb raising, *a letter to Mary* and *book to Sue* are the lower VPs after head-movement of the verb *sent*. It is therefore correctly predicted that they undergo coordination. Thus Larson eliminates the two alternative analyses in support of the VP-shell analysis.

With respect to double object constructions, Larson (1988) argues that they are derived from an oblique dative construction by a passive-like operation, “dative shift”. In Larson’s approach, an oblique dative NP and a verb form a predicate to a direct object NP. In other words, the lowest VP is taken to constitute a clause-like structure. Based on this idea, Larson draws a parallel between a passive structure and a double object structure. He argues that an oblique object undergoes passive-like movement to the position above a direct object. The derivation of a double object construction *sent Mary a letter* is schematized in the form of a tree in (14).



Larson (1988) analyzes a preposition that heads the oblique object to be a dative Case marker, motivated by the facts that indirect objects are marked with (dative) Case morphology in highly inflectional languages. Assuming that the lowest VP in (14) is a passive construction, and assuming that a

preposition is a realization of the Case assigned to the indirect object, the preposition *to* is absorbed. Then, the theta-role of the external argument-like NP *a letter* is “demoted” to the V'-adjoined position. (This is Larson's variation of suppression of assignment of an external role in passive.) Since the indirect object *Mary* is not assigned Case in the base position, it moves to the specifier position of the verb. This movement does not violate the theta-criterion, because the lowest spec-VP has no theta-role due to “demotion”. When the verb moves to the higher head position, it assigns Case to *Mary*, giving rise to the right word order.

The motivation for the dative shift theory of double object constructions comes from the fact that in many languages, there is a systematic relation between double object constructions and oblique dative constructions (cf. Baker 1985). Therefore the derivational approach is conceptually desirable under a theory that correlates syntactic structure to theta-role assignment like Baker's (1985) Uniformity of theta-assignment hypothesis (UTAH).

- (15) Uniformity of Theta-assignment Hypothesis  
 Identical thematic relationships are represented by identical structural relations between the items at the level of D-Structure.

The dative shift analysis gives a direct account for the observations made by Barss and Lasnik (1986). Under this analysis, the indirect object asymmetrically c-commands the direct object which is right-adjoined to V'. Hence the indirect object is predicted to bind the direct object.

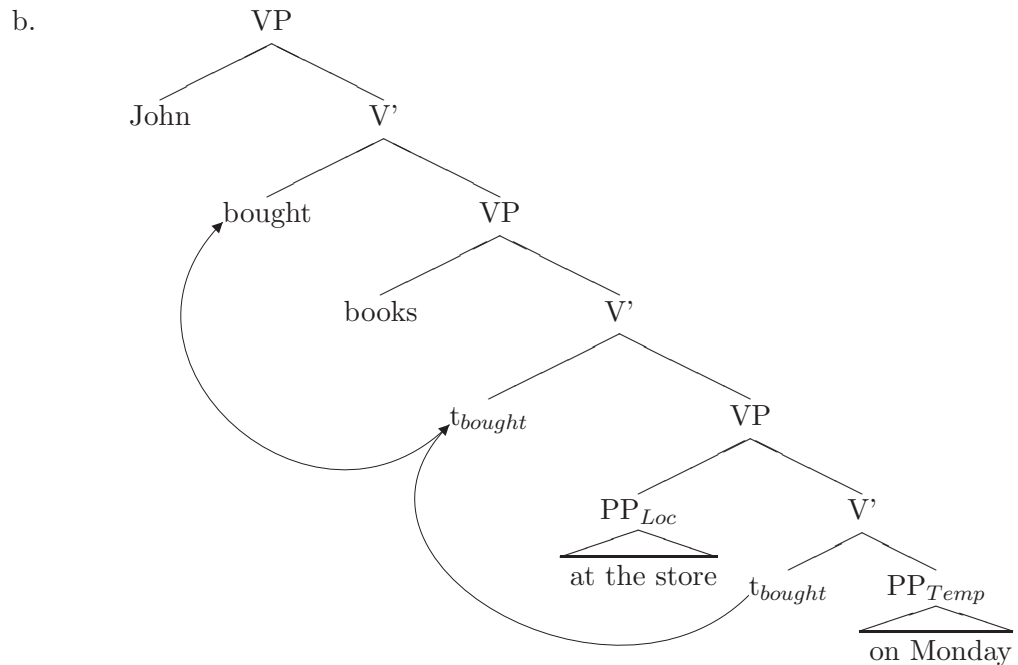
Larson (1988) extends the VP-shell analysis to modifier PPs. He assumes that similar to argumental PPs, modifier PPs are assigned an optional theta-role of some sort from the verb. Adopting the hierarchy of thematic relations from Carrier-Duncan (1985) in (16), Larson proposes that modifier PPs are generated at the very bottom of the VP-shell.

- (16) Agent > Theme > Goal > Obliques (manner, location, time etc)

In Larson's (1988) analysis, the derivation of a sentence with modifier PPs, a Loc PP and a Temp PP, in (17a) is illustrated in (17b).

- (17) a. John bought books [*Loc* at the store] [*Temp* on Monday].





The verb *bought* assigns a theta role to the Temp PP and the Loc PP which are in the complement position and the specifier position, respectively. The verb then moves up to the intermediate V position in order to assign a theta role and Case to the object *books*. Finally the verb moves to the highest VP to give a theta role to the subject *John*.

Larson's (1988) theory is important because it clears the way for binary structure of double object and oblique dative constructions. His VP-shell analysis, however, is not free from problems. The literature discusses some of the problems with respect to modifier PPs. Nilsen (1998), for example, argues against the Larsonian analysis for circumstantial adverbials because it i) makes incorrect predictions with respect to constituency tests such as VP-fronting and substitution, and ii) fails to account for relative clause extraposition data in Norwegian. In what follows, I briefly summarize Nilsen's (1998) counter-arguments to the Larsonian approach. Failure to account for the relative clause extraposition data in Norwegian will be discussed in relation to Nilsen's own proposal on modifier PPs in 2.2.4.

Let us first consider VP-fronting in Norwegian from Nilsen (1998). He shows that the word orders in (18b) and (18c) are possible in Norwegian.

- (18) a. Jeg møtte henne [<sub>Loc</sub> i parken] [<sub>Temp</sub> på fredag].  
 I met her in park on Friday  
 'I met her in the park on Friday.'
- b. [Møtte henne] gjorde jeg [<sub>Loc</sub> i parken] [<sub>Temp</sub> på fredag].  
 met her did I in park on Friday

- Meet her I did in the park on Friday.’
- c. [Møtte henne [<sub>Loc</sub> i parken]] gjorde jeg [<sub>Temp</sub> på fredag].  
 met her in park did I on Friday  
 ‘Meet her in the park I did on Friday.’ (Nilsen 1998: 63)

Under the Larsonian analysis, the sentence before VP-fronting is assigned the structure in (19). ((19) illustrates only a relevant part of the structure.)

- (19) [<sub>VP4</sub> met<sub>i</sub> [<sub>VP3</sub> her t<sub>i</sub> [<sub>VP2</sub> in the park t<sub>i</sub> [<sub>VP1</sub> t<sub>i</sub> [<sub>PP</sub> on Friday ]]]]]]

In (19), the verb ‘met’ is in the highest head V position in VP4, after the head-movement. The object ‘her’ occupies the specifier position of the intermediate VP3 and the two modifier PPs appear in the Spec,VP and the Comp-V of the two lowest VPs, respectively. In this structure, neither ‘meet her’ nor ‘meet her in the park’ forms a constituent. Assuming that only constituents undergo movement, the Larsonian analysis incorrectly predicts that the sentences with VP-fronting in (18b) and (18c) are ungrammatical.

Substitution by the pronominal form *so* makes the same point. Consider substitution data taken from Nilsen (1998) in (20).

- (20) John buried the corpse in the park on Friday, and...
- ...Jack did so in his garden on Saturday.
  - Jack did so on Saturday.
  - \*Jack did so in his garden.
  - \*Jack did so his mother in the garden on Saturday. (Nilsen 1998: 64)

The pronominal form *so* substitutes the sequence *buried the corpse* in (20a) and *buried the corpse in the park* in (20b). On the other hand, *so* cannot substitute the sequence *buried the corpse on Friday*, excluding the Loc PP as in (20c). It is not possible to substitute only a verb *buried*, either, as in (20d). Given substitution applies only to a constituent, the VP in the examples in (20) is assumed to have the following constituent make-up (21).

- (21) [ [buried the corpse] in the park ] on Friday]

The constituent make-up in (21), however, is not consistent with the one that is assigned by the Larsonian VP-structure. Under the Larsonian analysis the VP in (20) will be assigned the following constituent make-up (22).

- (22) [buried [the corpse [in the park on Friday]]].

According to the Larsonian analysis in (22), (20a) and (20b) are incorrectly predicted to be ungrammatical. As the constituent make-up in (21) suggests, the right structure for the VP in (20a) must contain modifier PPs, not in the lower domain but in the higher domain of the VP. Thus, the two arguments

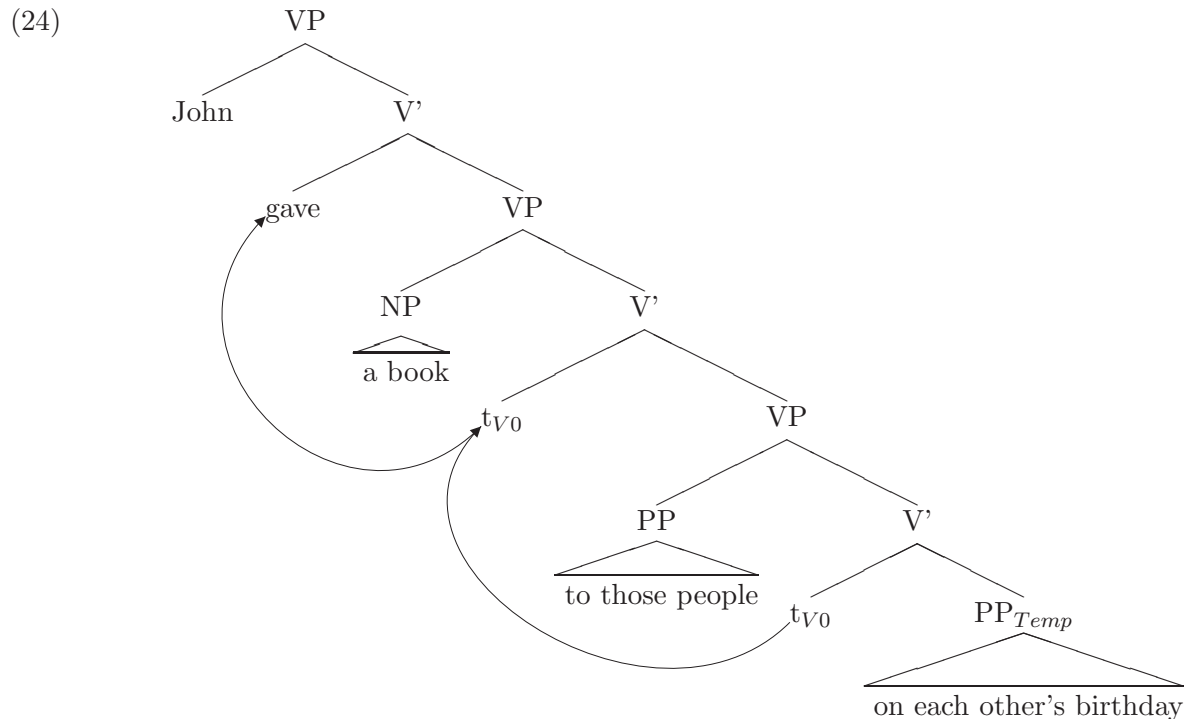
from VP-fronting and substitution by *so* strongly indicate that the analysis which posits modifier PPs at the bottom of VP is wrong. In the next subsection, Pesetsky's argument against the Larsonian VP-shell analysis, and his alternative analysis are presented.

### 2.2.2 Pesetsky (1995)

Pesetsky (1995) points out that the Larsonian VP shell analysis fails to capture c-command related facts, like binding correctly. Consider the sentence which contains a PP modifier with an anaphor and an IO with an antecedent in (23). In order for the sentence to be grammatical, the antecedent *those people* must bind the anaphor *each other's*.

(23) John gave a book [ to those people<sub>i</sub> ] [ on each other's<sub>i</sub> birthday].

Under Larson's analysis, the sentence in (23) will be assigned a structure in which the argument PP *to those people* occupies the specifier position of the lowest V and the Tem PP appears in the complement position of the lowest V.



In (24), the antecedent DP *those people* is embedded under the PP node, and hence, does not c-command the anaphor *each other's*. Consequently, the anaphor is not properly bound and the sentence is wrongly predicted to be

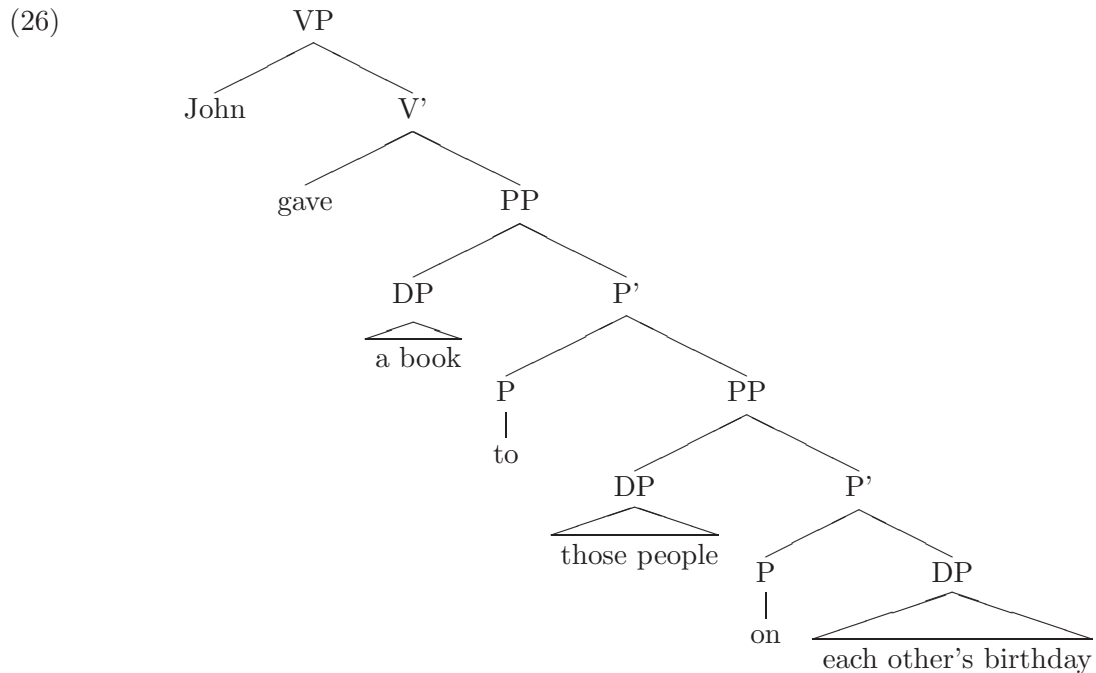
ungrammatical due to a condition A violation of Binding Theory (Chomsky 1981). Since the Larsonian VP-shell analysis fails to capture the binding facts and the constituency facts discussed in the previous subsection, it is assumed not to be an optimal analysis for PPs.

As an alternative theory to the VP-shell analysis, Pesetsky (1995) proposes a unique theory of cascade and layered structures. The essence of his proposal is that every sentence has two distinct phrase structures throughout the course of their derivation, a cascade structure and a layered structure. In what follows, I will now briefly describe each of the structures.

In the cascade structure of a VP, prepositions are introduced into the main projection line. These prepositions, in turn, introduce their arguments to the main projection line (25).

$$(25) \quad [V \dots [P_1 [DP_1 [P_2 [DP_2 \dots [P_n DP_n]]]]]]]$$

In the structure in (25), the DP1 asymmetrically c-commands DP2, as a consequence of which, binding facts are explained. Let us reconsider the problematic example of an oblique dative construction in (23). (23) will be assigned the following cascade structure under Pesetsky's (1995) theory.



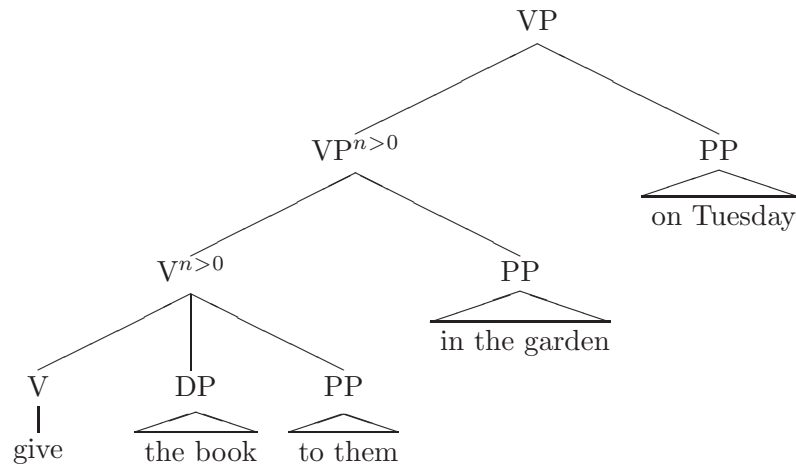
In (26), the preposition *to* introduces a goal DP *those people* into the main projection line. Another preposition *on* introduces an temporal DP *each other's birthday*. This allows the antecedent *those people* to c-command the anaphor *each other* which is embedded in the lowermost DP. Consequently, in his cascade structure, the antecedent successfully binds the anaphor.

Note, however, that the structure (26) the argument of the verb *a book* appears in the specifier position of the sister of the verb, and not in the traditional position as the sister to the verb. The same is applicable to the arguments of the prepositions *to* and *on*. The argument DP of the prepositions occupies the specifier position of the sister of the prepositions. Thus, neither the argumental PP nor the modifier PP forms a constituent. This introduces some incorrect predictions with regarding constituency and extraction. In a standard theory, only constituents can undergo movement. Given this widely accepted assumption, the cascade structure in (26), in which the head P and its argument do not form a constituent, would incorrectly predict a simple wh-movement of a PP to be disallowed (27).

(27) To whom did John give a book?

To avoid the constituency problems, Pesetsky (1995) proposes a layered structure. A layered structure is a structure in which arguments of a verb are its sisters and adjuncts are right-adjoined to projections of the verb higher than the minimal  $V'$ . In a layered structure, the sentence in (28a) is assigned structure in (28b) (Pesetsky 1995).<sup>4</sup> The tree in (28b) presents only the relevant parts.

(28) a. John gave the book to them in the garden on Tuesday.  
b.



In the layered structure in (28b), the verb *give* and its arguments *the book* and *to them* constitute a flat structure. That the layered structure has a flat VP with right-adjoined PPs above it is supported by the facts from VP-fronting.<sup>5</sup> Considers the examples with VP-fronting taken from Pesetsky

<sup>4</sup>In (28b), ' $V^{n>0}$ ' stands for a projection of the verb which is higher than the minimal  $V'$ .

<sup>5</sup>As discussed in 2.1, Nilsen (1998) argues against the left-adjoined structure of PPs on the basis of similar examples in Norwegian.

(1995: 230) in (29).

- (29) a. ...and [give the book to them in the garden on Tuesday] he did.  
 b. ...and [give the book to them in the garden] he did on each other's birthdays.  
 c. ...and [give the book to them] he did in the garden on each other's birthdays.  
 d. ?\*...and [give the book] he did to them on Tuesday in the garden on each other's birthdays.  
 e. \*...and [give] he did the book to them on Tuesday in the garden on each other's birthdays. (Pesetsky 1995: 230)

(29c) allows the sequence *give the book to them* to be fronted, stranding the Loc PP *in the garden* and the Temp PP *on Tuesday* in their base-positions. Given that VP fronting is a movement operation, and only a constituent can be moved, the fronted sequence in (29c) is assumed to be a constituent. If a sequence *give the book* or *give* forms a constituent to the exclusion of the argument PP *to them*, these sequences are predicted to undergo VP fronting. The ungrammaticality of (29d) and (29e), however, indicates that they do not form a constituent. Consequently, the sequence *give the book to them* is safely assumed to form a flat structure in (28b). Furthermore, the fronting fact in (29a) indicates that the Loc PP and the Temp PP are adjoined to the node above the node that contains the verb and its arguments. Similarly, the example in (29b) allows the sequence *give the book to them in the garden* to be fronted, leaving the Temp PP behind. This implies that the verb, its argument and the Loc PP form a constituent as proposed in the layered structure in (28b).

Pesetsky's theory can capture both the constituency facts and the binding facts. In this respect, it is superior to Larson's VP-shell theory. His theory, however, fails to give a correct prediction with regard to the ordering restriction among modifier PPs. In his cascade structure, for example, a Loc PP is generated in a higher position than a Temp PP. As will be argued for in the following chapter, modifier PPs in Japanese have a rigid underlying order in which Temp is higher than Loc. Similarly, as will be presented in 2.2.6, Schweikert (2005) proposes a PP hierarchy on the basis of German data, in which Temp is higher than Loc.<sup>6</sup> His cascade structure, then, cannot explain the base order of these modifier PPs, neither in Japanese nor in German. In his layered structure in (28b), Loc PP is adjoined to  $V^{n>0}$ , which is a segment. Given Kayne's (1994) definition of c-command, Loc PP c-commands Temp PP and Temp PP c-commands Loc PP.

(30) X c-commands Y iff X and Y are categories and X excludes Y and

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<sup>6</sup>Similarly, Nilsen (1998) argues that the order of modifier PPs is restricted as will be presented in 2.2.4.

every category that dominates X, dominates Y. (Kayne 1994: 16)

As will be demonstrated, Temp PP asymmetrically c-commands Loc PP in both Japanese (Chapter 3) and in German (e.g., Schweikert 2005, section 2.2.6), yielding a rigid order between the two PPs. Neither Pesetsky's layered nor cascade structure can predict this ordering restriction.

According to Pesetsky, the two structures are not competing with each other but are rather parallel organizations in each step of the derivation. The existence of the two distinct structures adds additional machinery to the theory, and in this sense the theory may bring a potentially unfavorable consequence to a minimalistic syntactic theory. In the following subsections, I present three other approaches to PPs which account for constituency facts without the need of parallel structures. These approaches include Barbiers (1995), Nilsen (1998) and Ernst (2002).

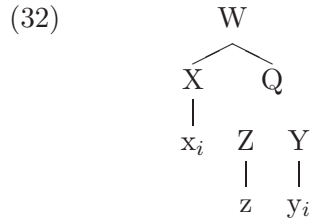
### 2.2.3 Barbiers (1995)

Barbiers (1995) presents an elaborate analysis of the derivation of modifier PPs with many movement operations based on the new syntax-semantics mapping principle called "Principle of Semantic Interpretation" and Kayne's (1994) antisymmetry theory.

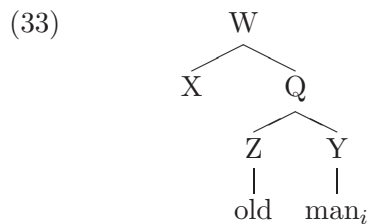
In traditional X-bar syntax, the X-bar structure does not have a unique mapping between syntactic structure and semantic interpretation. For example, under the X-bar theory, the syntactic relationship between a head and its complement can express several semantic relations such as a predicate-argument relation, a functor-predicate relation, etc. If the goal of a minimal syntactic theory is to establish a unique mapping of a syntactic relation onto a semantic relation, this type of syntactic theory is not a successful one.

Barbiers (1995) proposes to establish a one-to-one mapping between syntactic and semantic relations by reducing a ternary relationship to a binary one via movement. He hypothesizes that syntax mapping into semantic interpretation is conditioned by a "Principle of Semantic Interpretation (PSI)", which he assumes to be a condition on LF representations. Barbiers' PSI is formulated as in (31), and the simplest configuration that satisfies the PSI is schematized in (32).

- (31) Principle of Semantic Interpretation (Barbiers 1995: 7)
- a. A node Z establishes a S(EMANTIC)-Relation between a node X and a node Y iff X immediately c-commands Z and Z immediately c-commands Y.
  - b. A node Z is a QUALIFIER of a node X iff Z establishes a S(emantic)-Relation between X and Y, and X and Y are coindexed. (Barbiers 1995:7)

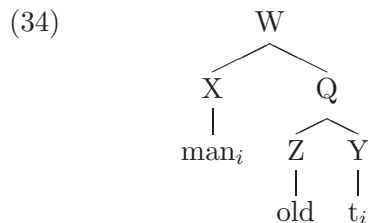


Barbiers (1995) proposes that the coindexation is established by movement of  $y$  to  $x$ , which he argues only be triggered by the need to establish a qualification relation. Consider the relation between the adjective *old* and the noun *man* which it modifies in (33).



According to (31a), *man* is generated in the complement position of *old*. The sequence *old man* seems to involve the meaning component “man is old” with a predication relation between *man* and *old*.

Under a theory with PSI, the meaning component in the interpretation of the string *old man*, which is the result of the movement of *man* to the specifier position of *old*, is expressed by an asymmetric binary relation between *man* and *old*, as schematized in (34).

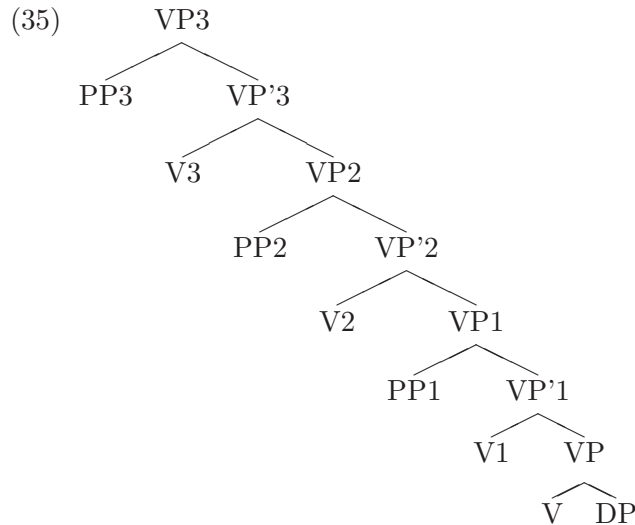


Given (31b), the qualifier *old* triggers the movement of *man* to its specifier position in order to establish a legitimate qualification configuration. The configuration resulting from the movement of *man* is an asymmetric binary relation which yields the desired interpretation “the man is old”. In essence, under his theory, asymmetric structure translates into a predicate-argument relation.

According to Barbiers (1995), the qualification relation mentioned in the PSI is the only syntactic relation that plays a role in semantic interpretation. He argues that this qualification relation holds in various syntactic domains, including the one between VP and adjuncts.



Let us consider how an ordering of modifier PPs is derived in Barbiers' theory. In his theory, each PP type is associated with a VP of different syntactic size via a qualification relation. Barbiers assumes that modifier PPs are base-generated in the specifier position of the higher region of the VP shell in the order  $PP3 > PP2 > PP1$ . The lexical verb and its arguments are generated in the lower region of the VP.

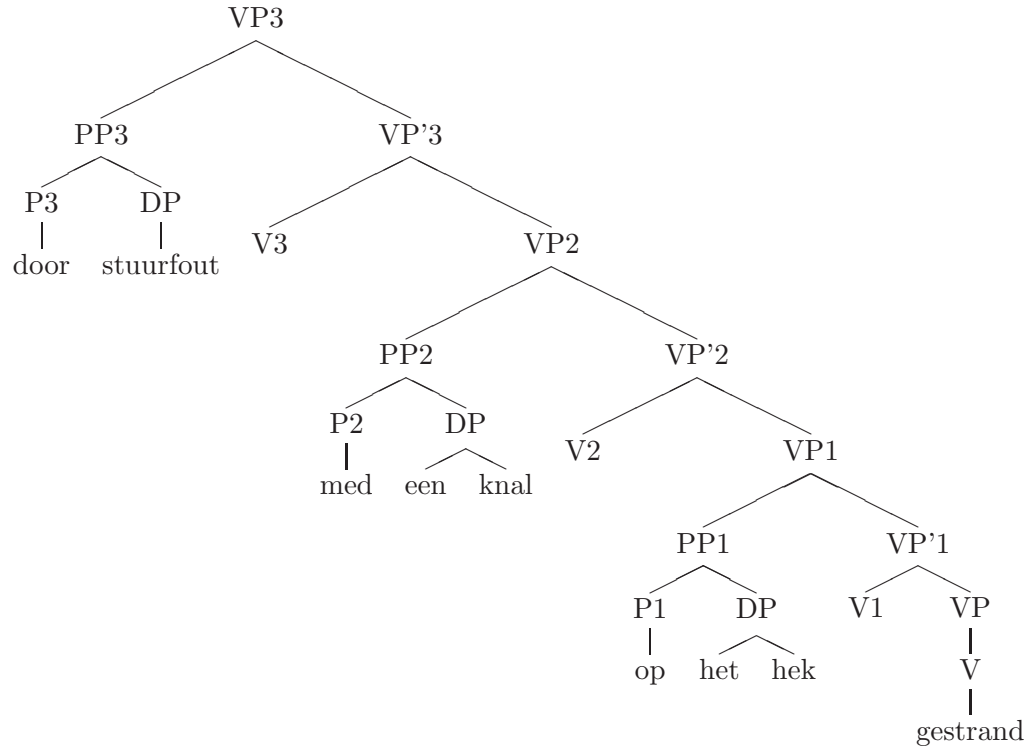


Under the PSI theory, Barbiers' account for the ordering facts of modifier adverbs in Dutch as follows. In Dutch, the order of preverbal modifier PPs is rigid, i.e.  $PP3 > PP2 > PP1 > VP$ . On the other hand, the order of postverbal modifier PPs is the mirror image of the order of preverbal PPs, i.e.  $VP > PP1 > PP2 > PP3$ , as exemplified in (36).

- (36) a. Hij is [<sub>PP3</sub> door'n stuurfout] [<sub>PP2</sub> met een knal] [<sub>PP1</sub> op het  
 He is by steering-error with a bang on the  
 hek][<sub>VP</sub> gestrand].  
 fence stranded  
 'He got stranded on the fence with a bang by a steering-error.'  
 (Barbiers 1995: 103)
- b. Hij is [<sub>VP</sub> gestrand] [<sub>PP1</sub> op het hek] [<sub>PP2</sub> met een knal] [<sub>PP3</sub>  
 He is stranded on the fence with a bang  
 door'n stuurfout].  
 by steering-error  
 'He got stranded on the fence with a bang by a steering-error.'  
 (Barbiers 1995: 103)

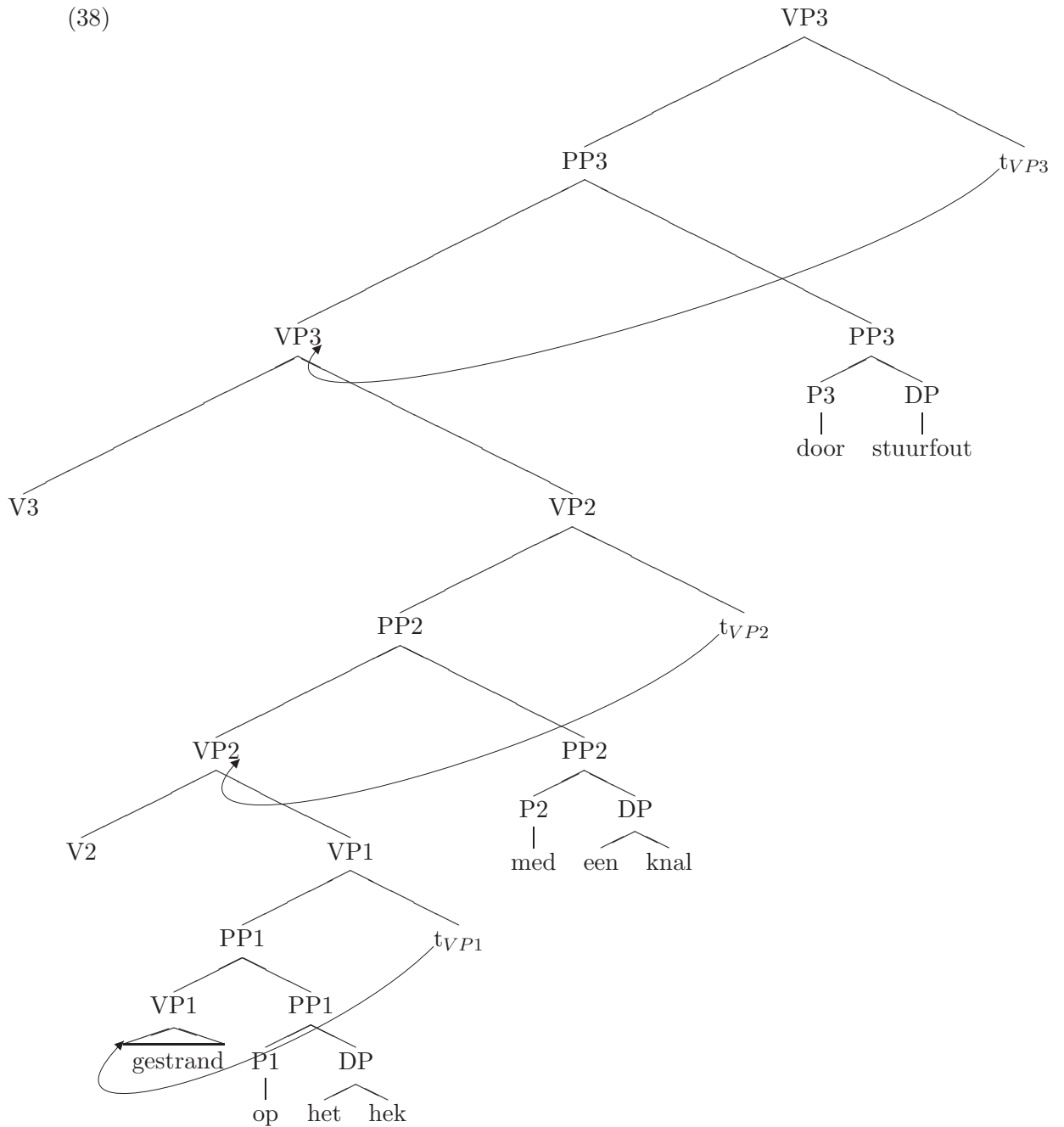
Under his analysis, both (36a) and (36b) have the same underlying structure of PPs, as in (37).

(37)



Given the PSI, PP3 is a qualifier of VP3, PP2 is a qualifier of VP2 and PP1 is a qualifier of VP1. At LF, the configuration should determine a qualification relation between PP3 and VP3, PP2 and VP2 and PP1 and VP1 in order to establish the semantic relation in each syntactic relation. These qualification relations are established by movement of each VP to the specifier of the PP that is adjoined to it, as schematized in (38).

(38)



In (38), the lowest VP1, which contains the main verb *gestrand*, first moves to the specifier of P1, which is a qualifier, establishing the predication relation between *gestrand* and *op het hek*. In the next step, the intermediate VP2 that contains *gestrand op het hek* undergoes movement to the specifier of P2, yielding the predication relation between *gestrand op het hek* and *med een knal*. Lastly, the highest VP3 that contains *gestrand op het hek med een knal*

moves to Spec,PP3, giving rise to the predication relation between *gestrand op het hek med een knal* and *door stuurfout*. Thus the derivation results in the correct order of post-verbal PPs in (36b), *gestrand op het hek med een knal door stuurfout*.

The movements of VPs to Spec,PPs are obligatory in order to establish the predication relations. This means that in (36a), in which pre-verbal PPs are arranged in the base order PP3 > PP2 > PP1 > VP, VPs also undergo movement. This VP movement is, however, covert. Hence the surface order of PPs remains the same in (36a).

The PSI theory seems to contain at least three potential theoretical problems. First, the structure after movement triggered by the PSI does not correctly represent the selection relationship between the head and its complement. Consider the sentence in (36a). In the base structure of the sentence, which is schematized in (37), VP3 selects VP2 as its complement, VP2 selects VP1 as its complement, and VP1 selects VP as its complement. However, after the movement of each VP to the specifier position of a qualifier PP, the head-complement relationship between the VPs is interrupted by a PP modifier (38). The same problem arises in the sentence in (36a). An LF representation after the PSI-triggered movement, therefore, fails to capture selection relations between a head and its complement in the main projection line.

The second problem is that it seems that traces of the moved VPs are not c-commanded by their antecedents and so movement operation in (38) seem to be sideways. Barbiers circumvents this problem by adopting Kayne's (1994) definition of c-command which states that "X c-commands Y iff X and Y are categories and X excludes Y and every category that dominates X, dominates Y." (Kayne 1994: 16). Given this definition of c-command, the moved VPs, which are only dominated by a segment of the PP, c-commands their traces.

Finally, the third problem is that the analysis would allow the extraction out of the specifier of an adjunct. As an example, assume the head movement of a verb to T. In Barbiers' (1995) analysis, a finite verb would move from the VP that is placed in the specifier of a PP to T. In the standard theory of syntax, however, adjuncts form islands for extraction, and, accordingly, movement out of the specifier of an adjunct is prohibited. As a short answer to this problem, Barbiers suggests that this problem can be avoided if he adopts a movement theory in which the shortest move condition is crucial Chomsky (1993). The VP movement to the specifier of the PP that it is adjoined to it is a short movement, and does not change any configurational properties except for the relationship between the PP and VP itself. In this sense, the nature of the VP-movement to spec,PP here is different from other XP-movements to specifier positions which result in the island for extraction.

### 2.2.4 Nilsen (1998)

On the basis of syntactic diagnostics, Nilsen (1998) argues that order of the adverbs in Norwegian is rigid. The adverb order he discovers in Norwegian roughly corresponds to the adverb order proposed by Cinque (1999; 2006).<sup>7,8</sup> Nilsen's study gives empirical support to the Cinque's hierarchy of sentential adverbs.

With respect to modifier PPs, Nilsen argues that similar to adverbs, PPs are strictly ordered in Norwegian. His arguments for the rigid PP order come from syntactic diagnostics like VP-topicalization. Consider the VP-fronting

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<sup>7</sup>There are some inconsistencies between Nilsen's (1998) hierarchy and Cinque's (1999, 2006) hierarchy, though. On the basis of Norwegian, Czech and Polish data, Nilsen (1998) argues that the relation between *Asp<sub>PL</sub>completive* and *Asp<sub>SG</sub>completive* is the opposite of what is proposed in Cinque (1999), i.e. *Asp<sub>PL</sub>completive* is higher than *Asp<sub>SG</sub>completive*.

<sup>8</sup>There are some instances of adverbs that show a free order (parenthetical adverbs and post-VP destressed adverbs). For example, in the VP-final position, destressed adverbs may occur in a free word order.

- (i) a. Per er vel her, heldigvis, allerede.  
'Per is well here, fortunately, already.'  
b. Per er vel her, allerede, heldigvis. (Nilsen 1998: 46)

Based on the scope facts, Nilsen argues that the adverbs in (i) are covertly merged directly to the root and argues that their relative freedom of ordering must be a PF-phenomenon. As supporting evidence Nilsen shows that parenthetical adverbs are sensitive to phonological rules, i.e. parenthetical adverbs can be interspersed into the sentence only if this does not result in breaking up an Intonation Phrase.

- (ii) a. I går overtok [en man, dessverre, uten erfaring]  
yesterday took.over a man, unfortunately, without experience  
administrasjonen.  
administration  
'Yesterday a man, unfortunately, without experience took over the ad-  
ministration.'  
b. \*I går overtok [en, dessverre, man uten erfaring]  
yesterday took.over a, unfortunately, man without experience  
administrasjonen.  
administration  
'Yesterday a man, unfortunately, without experience took over the ad-  
ministration.'

The parenthetical adverb *dessverre* may interrupt the subject, breaking up the constituency in (iia) but not in (iib). Since (iia) is grammatical, it is clear that syntactic constituency does not interfere with placement of parenthetical adverbs. What is crucial in (iib) is that an Intonation Phrase is broken up, because the article *en* forms an Intonational Phrase with the following word. Thus the Intonational Phrase is a relevant factor for the ungrammaticality of the sentence in (iib).

data set in (39). Nilsen shows that the word order in (39a) but not (39b) is a possible order in VP-fronting in Norwegian.

- (39) a. [Møtte henne [<sub>Loc</sub> i parken]] gjorde jeg [<sub>Temp</sub> på fredag].  
 met her in park did I on Friday  
 ‘Meet her in the park I did on Friday.’ (Nilsen 1998: 63)
- b. \*[Møtte henne [<sub>Temp</sub> på fredag]] gjorde jeg [<sub>Loc</sub> i parken].  
 met her on Friday did I in park  
 ‘Meet her I did in the park on Friday.’ (Nilsen 1998: 64)

Given that only constituents can be moved, the contrast between the sentences in (39) suggests that the VP ‘met her’ forms a constituent with the Loc PP ‘in the park’ excluding the Temp PP ‘on Friday’, while the VP cannot form a constituent with the Temp PP excluding the Loc PP. Assuming a right-adjoined structure of adverbs, for the reasons to be mentioned below, Nilsen concludes that Temp PP must be in a position higher than Loc PP. Nilsen’s PP hierarchy in Norwegian is schematized in (40).

- (40) Temp > (Habitual DP) > Loc > Atelic PP > Telic PP > Directive  
 > Instrumental > Directive

With regard to the structure of modifier PPs, he proposes that they are generated as reduced relative clauses that take a functional projection as an argument. His relative clause analysis is motivated by facts from Relative Clause Extraposition (henceforth RCE). In what follows, I will give a short description of his RCE argument.

Consider the example of the RCE in (41). In Norwegian, a restrictive relative clause on the object *som sa han kjenner deg* can be separated from the head NP by extraposition, as illustrated by the example in (41b).

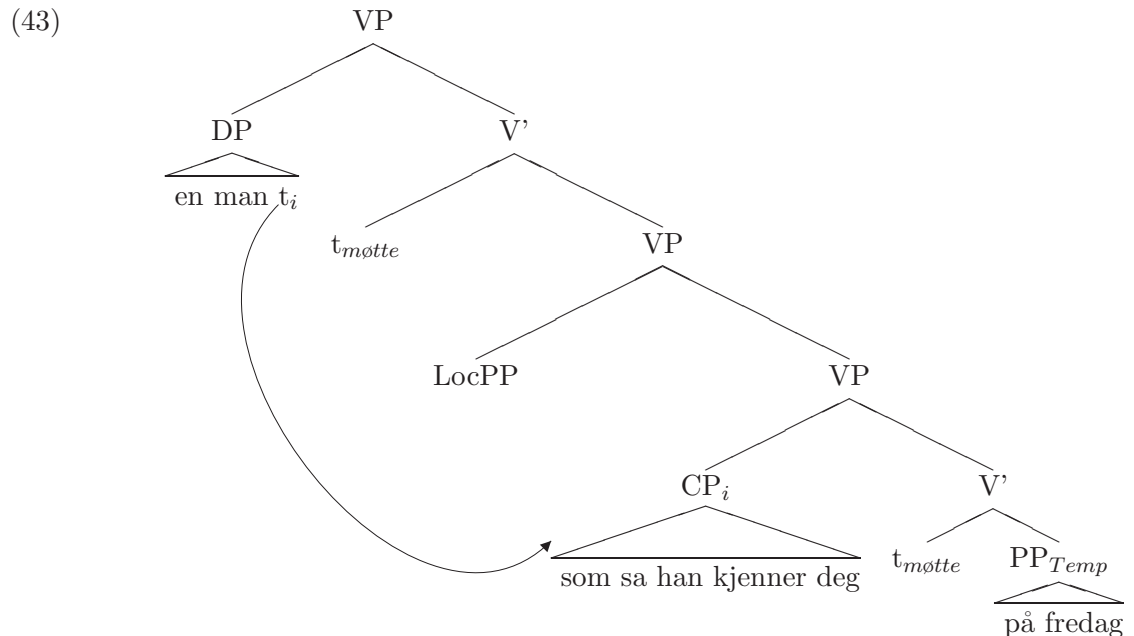
- (41) a. Jeg møtte en mann *som sa han kjenner deg* i parken.  
 I met a man SOM said he know you in park  
 ‘I met a man who said that he knew you in the park.’
- b. Jeg møtte en mann i parken, *som sa han kjenner deg*.  
 I met a man in park, SOM said he know you  
 ‘I met a man in the park, who said that he knew you.’

Furthermore, it is possible to place the relative clause between two modifier PPs, a Loc PP and a Temp PP. When it takes place, the order between the PPs and the relative clause is fixed, as illustrated in (42). In (42a), RCE allows the Loc-RC-Temp order, but not the Temp-RC-Loc order.

- (42) a. Jeg møtte en mann i parken, *som sa han kjenner deg*, på  
 I met a man in park, SOM said he know you, on

- fredag.  
Friday  
'I met a man in the park, who said that he knew you, on Friday.'
- b. \*Jeg møtte en mann på fredag, som sa han kjenner deg, i  
I met a man on Friday, SOM said he know you, in  
parken.  
park  
'I met a man on Friday, who said that he knew you, in the park.'

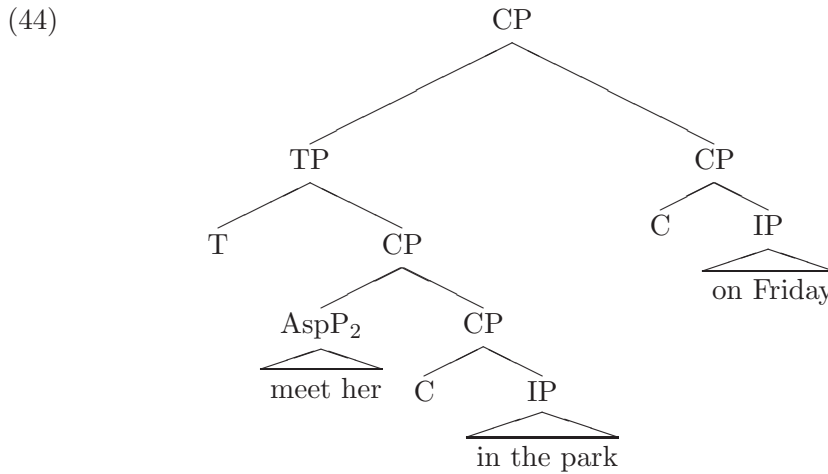
In the standard GB-analysis, a construction like the one in (41b) is derived by rightward movement of a relative clause to a VP-adjoined position. Given this standard assumption, a Larsonian analysis may correctly derive the construction in (41b) by rightward adjunction of the relative clause *som sa han kjenner deg* to the higher VP. The analysis, however, fails to predict that (42a) is grammatical. Under the VP-shell analysis, modifier PPs appear in the bottom of the lowest VP, whereas an internal argument is placed in a higher VP. In order to achieve the correct word order in (42a), in which the relative clause appears in between Loc PP and Temp PP, the relative clause must be rightward moved to a position between these two PPs. However, the rightward movement to a position between the two PPs forces lowering, as schematized in (43).



Given that lowering is a problematic operation because it leaves traces which are not c-commanded by their antecedents, it is not allowed to move the

relative clause to the position between the two PPs. Thus, the order in (42a) cannot straightforwardly be derived under the Larsonian analysis.<sup>9</sup>

In order to solve this problem, Nilsen (1998) presents an analysis of adverbials in which different circumstantial adverbials are reduced relative clauses that take different functional projections as their arguments. Adopting a version of the Referential Approach which is supported by Vikner (1985), he assumes that a Temp PP is a predicate on a referential time and proposes that the Temp PP takes a TP as its semantic argument. Under his analysis, then, a Temp PP is a reduced relative clause that is generated at TP. He also argues that a Loc PP is a reduced relative clause that is generated at AspP, as illustrated in (44).



Combined with a variant of Relativized Minimality (Rizzi 1990), Nilsen's analysis gives correct predictions with respect to the RCE constructions in (42a) and (42b). In Nilsen's analysis, the RCE construction in (42a), repeated here

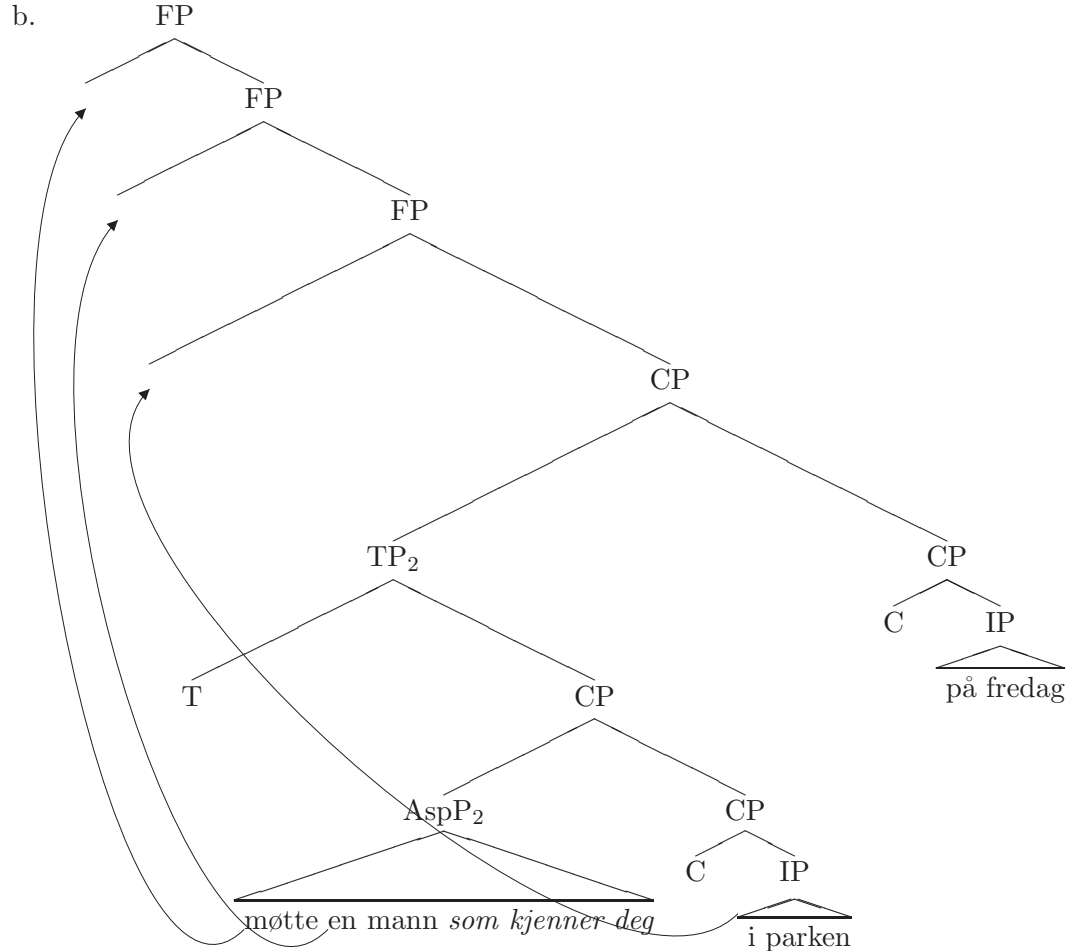
<sup>9</sup>Nilsen mentions that the combined theory of the Larsonian (1988) VP-shell and Kayne's (1994) relative clause analysis may give an account for the relative clause extraposition fact in (42a) and (42b). In this alternative analysis, instead of moving a relative clause to the right, the head DP *en mann* of a relative clause is raised out of the CP to a higher functional projection by leftward movement. Assuming that a Loc PP moves to the position higher than the stranded CP, the word order in (42a) is correctly derived. On the other hand, an ungrammatical word order in (42b) is disallowed, given that movement of a Temp PP, which is at the bottom of the VP-shell, across a Loc PP would violate locality constraints.

Nilsen argues against this alternative approach, however. Given some languages like Dutch display a mirror order of PPs, e.g., Temp-Loc. Under the Larsonian approach, deriving the mirror order assumes the movement of Temp PP across LocPP. Mirror ordering and relative clause extraposition force the Larsonian analysis to make adjustments that are inconsistent with each other. From this, Nilsen concludes that Larson's account of adverbials (combined with Kayne's relative clause analysis) cannot be maintained, i.e. adverbial PPs cannot be generated in the lowest VP-shell.



in (45a), will be assigned the following base-structure in (45b).

- (45) a. Jeg møtte en mann i parken, *som sa han kjenner deg*, på  
 I met a man in park, SOM said he know you, on  
 fredag.  
 Friday  
 'I met a man in the park, who said that he knew you, on Friday.'



Assuming that the focused material is the most embedded constituent (Cinque 1993), the focused material in (45) is the CP relative clause *som sa han kjenner deg*. Nilsen argues that in (45b) the verb ‘met’ and the object NP ‘a man’ and the Loc PP ‘in the park’, which are non-focused materials, evacuate from the focus domain by the leftward “defocus” movement to topic positions, stranding the relative clause CP in the focus position (cf. Kayne 1994). Assuming that two elements moving leftward preserve their relative order, this derivation results in the correct order in (45a).

The reason why the the order in (42b) is not a possible order is explained by

introducing a variant of Relativized Minimality. In (45) after moving the verb ‘met’ and the NP ‘a man’ out of the focus domain, there are only the relative clause CP and the two PPs left in the base-positions. Since the relative clause CP is not a topic but a focus, it does not participate in defocus movement. The two PPs which are potential topics, then, may undergo this defocus movement. Moving the Loc PP in (45) crosses the Temp PP which has the same Topic feature induces a sort of Relativized Minimality violation. Thus, the sentence in (42b) is correctly excluded.

Nilsen’s (1998) analysis which is combined with a referential approach to tense semantics, gives a straightforward explanation to the order between Temp and Loc. With respect to the order restrictions of other adverbials, he argues that they follow from Chinque’s hierarchy of adverbs.

Furthermore, his analysis accounts for the constituency facts discussed in section 2.1 (repeated in this section in (39)), which the Larsonian theory fails to explain. As seen in (39), a VP in Norwegian can be fronted together with a Loc PP to the exclusion of a Temp PP. Under Nilsen’s proposal, the VP and the right-adjoined Loc PP form a constituent. Accordingly it is correctly predicted that these two can be fronted leaving behind the Temp PP, which is adjoined the higher position. With regard to the substitution data, it is shown in (20) 2.2.1 that a VP and a Loc PP can be substituted by the pronominal form *so* to the exclusion of a Temp PP. This fact is explained in the same manner; the VP and the Loc PP form a constituent excluding the Temp PP. Therefore, the sequence V-Obj-Loc, but not the sequence V-Obj-Temp, can be substituted by the pronominal form *so*.

Although Nilsen’s analysis gives an account for constituency facts and some ordering restrictions among PPs, there are some problems in his analysis. It seems to me that Nilsen’s analysis suffers from the same problem which Barbiers’ analysis faces. In Nilsen’s analysis, different PP types take different functional projections as their arguments, thus a Temp PP takes a TP and a Loc PP takes an AspP as a complement. Resulting representation contains a sequence of projections CP-TP-CP-AspP-(CP-VP...) as a main projection line. In this sequence, however, T takes CP, and Asp takes CP as their complement. Thus, the selection relation between heads and their complements in the main projection line is not correctly represented in his analysis. In the next subsection, I present Ernst’s (2002) theory which relates different PP types to syntactic units of different sizes, without inducing a problem with respect to selection relation.

### 2.2.5 Ernst (2002)

Ernst (2002) presents a semantic based account for the distribution of adverbs. In his theory, the distribution of adverbs is largely determined by their lexical semantics and a compositional-semantic rule system.

His first assumption is that functional items in a clause have semantic selectional requirements, according to which they select a specific semantic type of object, called a Fact-Event Objects (FEOs), such as an event, a proposition, etc. Similar to functional items, adverbs select for specific FEOs as their semantic arguments. When semantic composition takes place, these semantic selectional requirements must be satisfied for a sentence to be grammatical.

Another basic assumption of his is that the composition of the FEOs is restricted by a rule system called the FEO-calculus (2002: 50).

- (46) ...the set of rules for building events and propositions, starting from the basic event and constructing more complex FEOs by adding layers of adverbials, quantificational operators, aspectual operators, modality, and so on, each one either shifting the type or subtype of FEO.

The three basic rules for the FEO-calculus are illustrated in (47).

- (47) a. Any FEO type may be freely converted to any higher type but not to a lower one, except:  
 b. Any FEO (sub)type may be converted to another FEO (sub)type as required by lexical item or coercion operators.  
 c. Events may be interpreted as Specified Events (SpecEvents) within PredP. (Ernst 2002: 50)

Using Ernst's (2002) two main assumptions regarding the lexical semantics of adverbs and the semantic compositional rule system, I will illustrate briefly how an adverb is semantically composed into a sentence. As a basic assumption for semantic composition, Ernst adopts a "Neo-Davidsonian" view that a basic event involves an event variable. In this view, a simple sentence without an adverb in (48a) is represented in semantic notation as in (48b).

- (48) a. Theo bought flowers.  
 b.  $\exists e [ B(e) \ \& \ Agt(e, t) \ \& \ Th(e, f) ]$

Consider now the sentence with a subject-oriented adverb in (49). When an adverb 'tactfully' is introduced into the sentence (49), it contains a subject-oriented reading, roughly giving rise to the meaning 'Theo was tactful to buy flowers'.

- (49) Theo tactfully bought flowers.

Ernst assumes that the adverb *tactfully* in (49) is a two-place predicate which selects, as its arguments, the agent *Theo* and the event that manifests Theo's tactfulness as its arguments. Because of this selection requirement, the adverb *tactfully* combines with the event of buying flowers, which is represented in (48b), giving rise to an event of tactfully-buying flowers. Finally, in order to

form a well-formed semantic representation, the FEO-calculus converts this event to a proposition which is denoted by the sentence in (49).

His analysis accounts for the ordering restrictions among the adverbs of different type in the following manner. For example, in English an epistemic adverb *probably* must precede a subject-oriented adverb *tactfully*, as illustrated in (50).

- (50) a. Gina has probably tactfully suggested that we leave.  
 b. \*Gina has tactfully probably suggested that we leave. (Ernst 2002: 131)

As seen above, in Ernst's theory, a subject-oriented adverb *tactfully* selects an event as a semantic argument to form an event. The resulting event is then converted to a proposition by the FEO-calculus. On the other hand, in his theory, the epistemic adverb *probably* selects a proposition to form a proposition. Given semantic selection, the order of adverbs is derived in the following manner. In (50a), the adverb *tactfully* first combines with the basic event of 'suggesting that we leave'. The FEO-calculus then converts it into a proposition. The resulting proposition can be combined with the adverb *probably*, giving rise to the right order in (50a). On the other hand, in (50b), *probably* first combines with a proposition. The next step is to convert this proposition. Due to rules in (47), FEO-calculus allows the conversion of a proposition to another proposition, but not to an event. Thus the semantic object derived by FEO-calculus is a proposition. The composition of the resulting proposition and the adverb *tactfully* leads to a semantic clash because of the semantic requirement that *tactfully* selects an event as an argument. Therefore, the order in which *tactfully* preceding *probably* is not allowed in (50b).

An advantage to Ernst's scope theory is that it eliminates homonyms with respect to the ambiguous adverbs. In Feature-based theories like the one proposed by Cinque (1999, 2006), adjuncts are licensed by featural relationships to heads. Therefore, an adverb which is ambiguous among different readings can be licensed by several different heads, yielding homonyms for the adverb. Ernst's theory can explain the ambiguity of adverbs without appealing to homonyms. For example, in English an adverb *cleverly* is ambiguous between a manner reading and a subject-oriented adverb reading. In his analysis, the adverb *cleverly* is the same adverb in either reading, and the positional difference results from the application of FEO-calculus.

Ernst claims that another advantage of his scope theory is that it can explain the difference in ordering restrictions among the different classes of adjuncts. He divides adjuncts into three classes in terms of the permutation possibilities; predicational adverbs which are rigidly ordered in general, participant adjuncts which permute freely without changing their meaning, and functional adjuncts which permute with meaning change.

According to Ernst, participant adjuncts are mostly realized by PPs such as Instrument, Benefactive, Locative, Goal and Source. Following Parsons (1990), Ernst assumes that similar to arguments of the main predicate, these PPs serve as relations between participants and basic events. Unlike predicational adverbs, though, they do not select for a semantic argument, and therefore, they do not have scope requirements imposed on them by FEO-calculus. The reordering of these adjuncts, therefore, do not induce semantic clash, and hence, the modifier PPs can be freely rearranged. In contrast, predicational adverbs have tight scope requirements (from FEO-calculus), and reordering of these adverbs may induce semantic clashes. Thus, only one order is allowed with these adverbs. Functional adverbs, which include adverbs of time, negation and frequency, have with somewhat looser scope requirements. Reordering of these adjuncts yields different scope readings, as illustrated in (51). In (51) the order between a predicational adverb *intentionally* and the functional adjunct *never* can be reversed with a clear difference in meaning.

- (51) a. The speaker never intentionally strays from the topic.  
 b. The speaker intentionally never strays from the topic. (Ernst 2002: 131)

The major criticism against Ernst's analysis is that it does not give an account for the fact that the order of modifier PPs is restricted. As seen in the previous subsection, Nilsen's (1988) study shows that modifier PPs in Norwegian are rigidly ordered. His PP hierarchy is repeated in (52).

- (52) Temp > (Habitual DP) > Loc > Atelic PP > Telic PP > Directive  
 > Instrumental > Directive

In Ernst's (2002) approach, the scope requirements are not imposed on the modifier PPs. They simply take a basic event argument and can be freely adjoined to verbal projection freely. Thus, their relative order is not restricted. His analysis, therefore, wrongly predicts that there is no word order hierarchy of modifier PPs in Norwegian.

Recently, another study has shown that word order among modifier PPs is restricted. In the next section, I will present Schweikert's (2005) study of German modifier PPs which argues for a fine-grained hierarchy of modifier PPs in German.

## 2.2.6 Schweikert (2005)

This section presents a recent study of prepositional modifiers by Schweikert (2005). Following Cinque (1999), Schweikert (2005) proposes that there is a universal hierarchy of PP modifiers, in which each PP modifier is base-generated in a unique position.

His motivation for the unique position of each PP type comes from a ban on the iteration of a modifier PP. In German, it is not allowed to have two PPs of the same type in the same clause. For instance, Schweikert demonstrates that two Benefactive PPs, two Instrumental PPs, and two Matter PPs cannot appear together. Consider the sentence with two Benefactive PPs in (53).

- (53) \*Hans arbeitete für Herr Mayer für Herr Müller.  
 Hans worked for Mr. Mayer for Mr. Müller  
 ‘Hans worked for Mr. Mayer and for Mr. Müller.’ (Schweikert 2004: 50)

According to Schweikert, the ungrammaticality of the sentence in (53) is not due to a semantic restriction, since conceptually there is no reason that prevents *Hans* from working for two people. From this, he assumes that the ungrammaticality of the sentence must not be semantic, but syntactic in nature. Furthermore, he points out that traditional adjunction approaches, in which adverbials are introduced into a clause by adjunction, cannot explain the ungrammaticality of sentence (53). The traditional adjunction approach often assumes that adjunction is a free operation in the sense that it is an intrinsically unordered operation. Also it does not restrict the number of elements that can be adjoined to a given category (Laenzlinger 1998).<sup>10</sup> Under traditional adjunction analyses, therefore, a Benefactive PP would be wrongly allowed to adjoin alongside another Benefactive PP.

Schweikert (2005) argues that the behavior of PPs in (53) is rather expected if we assume that there is only one syntactic position for each type of PP in a clause structure. This is indirectly supported by the fact that the sentence in (53) becomes grammatical if a coordinator *und* ‘and’ is inserted in between the two Benefactive PPs, changing the syntactic relation between the two PPs from adjunction to a coordinated structure. He thus argues against the traditional adjunction approaches, and rather motivates a theory with unique positions for each of the modifier PPs.

Schweikert’s main proposal is that the underlying order of modifier PPs is rigid. In order to detect the base order of the PPs, he applies syntactic diagnostics to all possible combinations of different PP types in German. The results of the diagnostics reveal that the base order among the PPs in German is strictly constrained. From these results, he concludes that modifier PPs are hierarchically arranged.

In what follows, I present Schweikert’s methodology to determine the underlying order of modifier PPs and the PP hierarchy deduced from his empirical observations. In his thesis, Schweikert discusses fourteen tests as potential

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<sup>10</sup>Chomsky (1995) acknowledges that adjunction should be a constrained operation. For example, adjunction to semantically vacuous targets should be permitted, but adjunction to semantically active projections, like argumental projections, should be prohibited.

diagnostics for the underlying word order. Among these potential tests, he applies three to all possible combinations of fourteen different PP types in German. His classification of prepositions into fourteen groups is based on the thematic role that each preposition bears in relation to the meaning of the clause. The list of German prepositions investigated is given in (54).

- (54) PPs investigated in Schweikert (2005)
1. Temporal (*am Sonntag* ‘on Sunday’)
  2. Benefactive (*für seine Frau* ‘for his wife’)
  3. Reason (*wegen einer Krankheit* ‘because of illness’)
  4. Locative (*in Venedig* ‘in Venice’)
  5. Instrumental (*mit einem Schraubenzieher* ‘with a screwdriver’)
  6. Manner (*auf besondere Art und Weise* ‘in a special way’)
  7. Comitative (*mit einem Kollegen* ‘with a colleague’)
  8. Evidential (*nach einer alten Legende* ‘according to an old legend’)
  9. Matter (*über Mathematik* ‘about mathematics’)
  10. Goal (*nach Hamburg* ‘to Hamburg’)
  11. Source (*von Hamburg* ‘from Hamburg’)
  12. Path (*über Mainz* ‘through Mainz’)
  13. Malefactive (*gegen das schlechte Wetter* ‘against the bad weather’)
  14. Means (*mit den Bus* ‘by bus’)

The three tests applied to the possible combination of different PP types yield results which suggest a consistent transitive hierarchy of modifier PPs. In what follows, I briefly summarize his three tests; a quantifier scope test, an informational focus test, and a pair-list reading test.

### Quantifier Scope test

The general methodology of Schweikert (2005) is based on Kayne’s (1994) antisymmetry. Following Kayne (1994), Schweikert assumes that in order to define a linear order between the constituent A and B, the relation between the two constituents has to be, therefore, Antisymmetric, Transitive and Total. The potential tests that Schweikert discusses in his thesis, therefore, are designed to show whether the relationship between two constituents is antisymmetric. Among the fourteen potential tests, he adopted three tests, which are easily applicable to German PPs. In this section, I will give a short summary of the first of those tests, the quantifier scope test.



Scope ambiguity between two quantificational elements is standardly used as a tool to detect the base position of a quantificational element in relation to the other quantificational element. The theoretical assumption behind this is that the interpretation of quantificational elements is reflected in the structural position of those elements. For example, Aoun and Li (1989) formalize this assumption and propose that for two quantificational elements, A and B, A may have scope over B if A c-commands B or a trace of B. (for similar proposals, see Lasnik and Saito 1994). According to this proposal, if a structurally lower quantificational constituent B is moved over a higher quantificational constituent A, A can take wide scope over B and B can take wide scope over A. Concrete examples from Huang (1995) are illustrated in (55).

- (55) a. What did everyone buy  $t_{what}$  for Max?  
 b. Who  $t_{who}$  bought everything for Max? (Huang 1995: 136)

The sentences in (55a) and (55b) behave differently with respect to the relative scope of wh-phrases and universal quantifiers. (55a) allows both a distributive/pair-list reading of *everyone*, i.e., a wide scope of the universal quantifier over the wh-phrase, and a collective reading of *everyone*, i.e., a wide scope of the wh-phrase over the universal quantifier. In contrast, (55b) allows only the wide reading scope of *who*. Under the proposal given by Aoun and Li (1989), the contrast in scope ambiguity between (55a) and (55b) is accounted for in the following manner. In (55a), the moved object *what* c-commands the subject *everyone* and *everyone* c-commands the trace of *what*. *What* can either scope over and under *everyone*. In (55b) a moved subject *who* c-commands the object *everyone*. *Everyone*, however, c-commands neither *who* nor its trace. Consequently, only a wide scope reading of *who* is available.

Schweikert adopts the assumption that an asymmetrical scope relation is reflected in an asymmetrical c-command relation, and he hence adopts scope asymmetry as a test for the base structure.

He first demonstrates that this test works for objects in a double object construction. Assuming that the IO is base-generated higher than the DO in German, the prediction is that in an IO-DO order, where the IO unambiguously c-commands the DO, only wide scope of the IO is expected. On the other hand, when the DO has moved across the IO, the moved DO c-commands the IO, which in turn c-commands the trace of the DO. Therefore, the scope ambiguity is expected. This prediction is borne out. Consider the examples in (56) and (57). As illustrated in (56) when an IO precedes a DO, the IO unambiguously takes scope over the DO. The reverse scope is not available in this order.

- (56) a. Ich habe [<sub>IO</sub> **mindestens** einem Freund] [<sub>DO</sub> **alle** Fotos] gezeigt.  
 I have **at.least** one friend **all** photo showed  
 ‘I have shown all photos to at least one friend.’



- b.  $\exists x, \forall y, \text{show}(I, x, y)$  ('There is at least one friend  $x$  such that I showed all photos  $y$  to  $x$ .)'  
 c.  $^*\forall y \exists x, \text{show}(I, x, y)$  ('For all photos  $y$ , there is at least one friend  $x$  such that I showed  $x$   $y$ .)'

In contrast, in the DO-IO order, both the surface scope (i.e., the wide scope of DO) and the reverse scope (i.e., the narrow scope of DO) are possible, as illustrated in (57).

- (57) a. Ich habe [<sub>DO</sub> **alle** Fotos] [<sub>IO</sub> **mindestens** einem Freund] t<sub>DO</sub>  
 I have **all** photo **at.least** one friend t  
 gezeigt.  
 showed  
 'I have shown all photos to at least one friend.'  
 b.  $\exists x, \forall y, \text{show}(I, x, y)$   
 c.  $\forall y \exists x, \text{show}(I, x, y)$

Based on the data sets in (56) and (57), Schweikert assumes that scope ambiguity can safely be used as a diagnostic for structural positions of two constituents. He therefore applies this test to modifier PPs.

Schweikert applies this test to all the possible combination of PPs in German. He observes that each combination shows asymmetry with respect to relative scope. For instance, with the Temp/Benefactive combination, only the Benefactive-Temp order yields the scope ambiguity. Consider the examples in (58) and (59), taken from (Schweikert 2005: 72).<sup>11</sup> As shown in (58), when a Benefactive PP precedes a Temp PP in (56), both the wide scope and the narrow scope of the Benefactive PP are obtained.

- (58) a. Ich habe [<sub>Ben</sub> für mindesten einen Chef] [<sub>Time</sub> an jedem Tag]  
 I have for **at.least** one boss on **every** day  
 gearbeitet.  
 worked  
 'I have worked for at least one boss on every day.'  
 b.  $\exists > \forall$   
 c.  $\forall > \exists$

When the order is reversed, however, only the narrow scope of the Benefactive PP in relation to the Temp PP is available as in (59).

<sup>11</sup>Schweikert (2005) modifies the existential quantifier with *mindesten* 'at least' in order to avoid an indefinite reading, which may give an apparent wide scope reading without movement. Furthermore, he creates two patterns of quantifier combination, existential over universal and universal over existential, in order to make sure that the test gives consistent results,.

- (59) a. Ich habe [*Time* an jedem Tag] [*Ben* für mindesten einen Chef]  
 I have on **every** day for **at.least** one boss  
 gearbeitet.  
 worked  
 ‘I have worked for at least one boss every day.’  
 b.  $??\exists > \forall$   
 c.  $\forall > \exists$

If the base order between the two PPs is Temp-Benefactive, this scope asymmetry is expected. In the base order in (59) *an jedem Tag* is structurally higher than *für mindesten einen Chef*, allowing only a wide scope reading of *an jedem Tag* over *für mindesten einen Chef*. In the derived order in (58), on the other hand, *an jedem Tag* c-commands *für mindesten einen Chef* and *für mindesten einen Chef* c-commands the trace of *an jedem Tag*. This allows either the wide or narrow scope reading of *an jedem Tag*.

Schweikert examined all possible PP type combinations in order to get transitive results. Similar to the Temp/Benefactive combination, other combinations of PPs show that the relation between the PPs of different types is antisymmetric. Consequently, the results of the Quantifier Scope test leads to the hierarchy, illustrated in (60):

- (60) Evidential > Temporal > Locative > Comitative > Benefactive >  
 Reason > Source > Goal > Malefactive > Path/means > Instrumental > Matter > Manner

What follows demonstrate that the other two tests which Schweikert (2005) adopts give rise to PP hierarchies which are consistent with the hierarchy modeled on the results of the quantifier scope test.

### Informational Focus test

Schweikert (2005) uses information focus as a tool to detect the base position of the PPs. He observes that the order between an IO and a DO in German double object constructions is restricted according to which object the information focus is assigned to. A constituent question and answer are standardly used as a diagnostic for informational focus. For example, in English, what is asked by a *wh*-word in a constituent question normally corresponds to the new information in the response as in (61). An element which carries an informational focus is marked in boldface.

- (61) a. What did she eat?  
 b. She ate [*FOCUS* **sushi**].

In (61b) *she* is the topic, which is the old information, and *sushi* is the focus, which represents the new information asked by *what*.

In a double object construction in German, both the IO-DO order and the DO-IO order are allowed if the IO is questioned and accordingly focused, as illustrated by the examples in (62).

- (62) a. **Wem** hast du das Geld gegeben?  
 whom have you the money given  
 ‘To whom did you give the money?’  
 b. Ich habe [*IO dem Kassierer*] [*DO das Geld*] gegeben.  
 I have the.DAT cashier the money given  
 ‘I gave the money to the cashier.’  
 c. Ich habe [*DO das Geld*] [*IO dem Kassierer*] gegeben.  
 I have the money the.DAT cashier given  
 ‘I gave the money to the cashier.’ (Schweikert 2005:78)

If the DO is questioned, on the other hand, only the IO-DO order is allowed. The reverse DO-IO order is not available in this case.

- (63) a. **Was** hast du dem Kassierer gegeben?  
 what have you the cashier given  
 ‘What did you give to the cashier?’  
 b. Ich habe [*IO dem Kassierer*] [*DO das Geld*] gegeben.  
 I have the.DAT cashier the money given  
 ‘I gave the money to the cashier.’  
 c. ?Ich habe [*DO das Geld*] [*IO dem Kassierer*] gegeben.  
 I have the money the.DAT cashier given  
 ‘I gave the money to the cashier.’ (Schweikert 2005:78)

Assuming that the IO-DO is the base order, the two data sets in (62) and (63) show that a flexible focus assignment is possible in a base order, whereas in a derived order, only the IO can carry an information focus. Stated differently, the two data sets indicate that focus on an in situ expression appears to be acceptable, whether or not other material is scrambled across it. Focus on a scrambled element, however, is not acceptable in German.

Schweikert (2005) applied this test to prepositional modifiers. He constructed possible PP combinations among the fourteen different PPs, and for each combination of PP types he constructed two constituent questions. Then, he tested whether the focused element can precede the other PP. He discovered that there is a significant difference between different PP orders with regard to informational focus assignment. Consider a Temp/Loc pair as an example. In the sentences in (64b) and (64c), the Temp PP ‘on Sunday’ carries informational focus.

- (64) a. **Wann** hat Hans in München geschlafen?  
 when has Hans in München slept  
 ‘When did Hans sleep in München?’

- b. Hans hat [*Temp* **am Sonntag**] [*Loc* in München] geschlafen.  
 Hans has on Sunday in München slept  
 ‘Hans slept on Sunday in München.’
- c. Hans hat [*Loc* in München] [*Temp* **am Sonntag**] geschlafen.

As illustrated in (64), when the Temp PP is focused, it can either precede or be preceded by the Loc PP, thereby allowing both the Temp-Loc and Loc-Temp orders.

Consider now the sentences where the Loc PP ‘in München’ carries the informational focus.

- (65) a. **Wo** hat Hans am Sonntag geschlafen?  
 where has Hans on Sunday slept  
 ‘Where did Hans sleep on Sunday?’
- b. Hans hat [*Temp* am Sonntag] [*Loc* **in München**] geschlafen.  
 Hans has on Sunday in München slept  
 ‘Hans slept on Sunday in München.’
- c. ??Hans hat [*Loc* **in München**] [*Temp* am Sonntag] geschlafen.

Unlike with the temp PP, when the Loc PP is focused, it must be preceded by the Temp PP (65b). As the ungrammaticality of the sentence in (65c) shows, it cannot precede the Temp PP. The two data sets in (64) and (65) show that the Temp-Loc order allows either of the PPs to carry informational focus, whereas the Loc-Temp order only allows Temp to carry the focus. Assuming that the base order allows a flexible focus assignment, whereas a derived order allows only an in situ element to carry the focus, Schweikert argues that the Temp-Loc is the base order.

The results of the Informational Focus test in German led Schweikert to propose the following hierarchy in (66).

- (66) Evidential > Temporal > Locative > Comitative > Benefactive > Reason  
 > Source > Goal > Malefactive > Instrumental/means > Path/Instrumental  
 > Matter > Manner

This hierarchy (66) is identical to the one extracted from the Quantifier Scope test except for the relation between Instrumental and Path. According to the Quantifier Scope test, Path was placed higher than Instrument (Path > Inst), whereas the Informational Focus test suggests the reverse base order Inst > Path.

### Pair-List Reading test

Bruening (2001) studies the interaction between wh-operators and universal quantifiers and observes that the interpretational effects obtained by such an interaction is analogous to quantifier scope ambiguities. This observation gives

support to May’s (1998) claim that “wh-quantifier” interaction is not different from “quantifier-quantifier” interaction (May 1988). Following Bruening (2001), Schweikert (2005) uses the “wh-universal quantifier (henceforth wh- $\forall$ )” interaction as a tool to detect the base order of PPs in German.

Bruening (2001) observes that the two wh-questions that have the “wh- $\forall$ ” linear order show asymmetry with respect to possible answers. Consider the example in (67). Both questions in (67) contain a wh-phrase followed by the universal quantifier *every* in the surface order.

- (67) a. *Which sheet* did he drape over *every armchair*?  
 b. *Which armchair* did he drape with *every sheet*?

The question in (67a) allows two different answers, a single constituent answer and a pair-list answer, as illustrated by the examples in (68).

- (68) a. It was the black sheet that he draped over every chair. (Single constituent answer)  
 b. He draped the black sheet over the large armchair, the white sheet over the small chair and the green sheet over the old armchair. (Pair-list reading answer)

The interpretations in (68) seem to be similar to the ones that are obtained by the interaction of an existential quantifier and a universal quantifier. In the single constituent answer in (68a), *which sheet* has wide scope over *every armchair*, while in the pair-list reading answer in (68b) *every sheet* takes wide scope over *which armchair*. On the other hand, the question in (67b) allows the single constituent answer, but not the pair-list reading answer. If one considers the interpretational effects yielded by the “wh- $\forall$ ” interaction as analogous to the effects of quantifier scope ambiguity, the question in (67a) and the one in (67b) can be interpreted to contain the different underlying orders of the wh-phrase and the universal quantifier.

Let us consider the structures of the sentences in (67). In (67a) a wh-phrase c-commands the universal quantifier, allowing the wide scope reading of the wh-phrase on the surface structure. Since (67a) also allows the reverse scope, the wh-object must be c-commanded by the universal quantified phrase in the underlying base-structure. From this, it is concluded that the wh-phrase is underlyingly lower than the PP that embeds the universal quantifier. (67b), on the other hand, unambiguously gives rise to the wide scope reading of the wh-object, implying that the object is base-generated higher than the PP.

Schweikert applies this test to all possible combination of modifier PP in German. The results show that a  $PP_{wh}$ - $PP_{universalQ}$  combination allows the pair-list reading answer, depending on the type of the PP. Consider the Temp/LocPP combination as an example. In (69), a sentence-initial wh-phrase questions a Loc PP and a Temp PP (that embeds a universal quantifier) is in

the middle field.

- (69) *Wo* hat Hermann *an jeden Tag* gespielt?  
 Where has Hermann on every day played  
 ‘Where did Hermann play each day?’

The question in (69) permits both a single constituent answer and a pair-list reading answer. Schweikert interprets this fact as an indication that the Loc PP is lower than the Temp PP in the underlying structure.

Consider now the question in (70). (70) is the reversed pattern, in which a wh-phrase questions the Temp PP and the Loc PP is in the middle field.

- (70) *Wann* hat Hermann *in jeder Stadt* gespielt?  
 When has Hermann in every town played  
 ‘When did Hermann play in every town?’

Unlike the question in (69), the question in (70) only permits a single constituent answer. If the Temp PP is underlyingly higher than the Loc PP, non-ambiguity of the answer is expected. In (70), the Temp PP with the wh-phrase c-commands the Loc PP with the universal quantifier in the base-structure as well as in the surface structure. Therefore, wide scope of the wh-phrase (i.e., the single constituent answer), but not the reverse scope (i.e., the pair-list reading), is obtained.

From the result of the pair-list reading test, Schweikert extracts the following hierarchy of the modifier PPs in German.<sup>12</sup>

- (71) Evidential > Temporal > Locative > Comitative > Benefactive > Reason  
 > Source > Goal > Malefactive > Instrumental/Means > Path > Matter  
 > Manner

The hierarchy in (71) is identical to the hierarchy extracted from the other tests. Thus, the results of the three tests indicate a consistent hierarchy of modifier PPs in German.

### 2.2.7 Summary

The analyses presented in this chapter can be roughly classified into three types. The first type is Larson’s (1988) VP-shell analysis in which modifier PPs

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<sup>12</sup>Schweikert (2005) notes that the pair-list reading test does not give a complete listing of all the relations between the different PPs. A Means PP can appear in two positions; one higher than Malefactive and one at the same height as Instrumental.

- (i) ...Means > Malefactive > Instrumental/Means...

According to the other two tests, the MeansPP is lower than MalefactivePP. From this, Schweikert determines that the order of these PPs is Malefactive > Means.

are generated in the lower VPs as a verb's thematic arguments of some sort. The second type is Pesetsky's (1995) cascade structure theory which posits two abstract parallel structures for one configuration; one with right-adjoined structure of PPs above the VP, and the other with a left-adjoined structure of PPs below the VP. The third type includes a theory in which adverbials are predicates on functional projections above the VP. This approach includes Barbiers' (1995) predication theory, Nilsen's (1998) relative clause analysis of PPs, Ernst's (2002) semantic theory, and Schweikert's (2005) theory of the PP hierarchy.

Larson's analysis explains some coordination facts, but it gives wrong predictions with respect to constituency and binding facts. Pesetsky's (1995) theory, on the other hand, accounts for both the constituency and binding facts. His theory with two parallel structures, however, does not explain the word order restrictions among modifier PPs observed by Schweikert (2005) in German.

In both Barbiers' (1995) analysis and Nilsen's analysis (1998), the constituency facts are straightforwardly explained. The binding facts, however, remain unexplained. Another potential problem with their approaches is that in their analyses, a derived structure with modifier PPs does not correctly represent a head-complement relationship in the main projection line.

With respect to Ernst's (2002) theory, he assumes that modifier PPs do not have scope requirements and hence their word order is not restricted. His analysis, therefore, cannot account for the fact that the underlying order of PPs is rigid, as observed in Schweikert (2005).

Schweikert's (2005) discovery that there is a hierarchy of modifier PPs is compatible with Cinque's (1999; 2006) theory of the sequence of functional projections. There is, however, one question which remains to be answered: where are those PPs located in Cinque's hierarchy of the middle field? In Cinque's hierarchy of the middle field, most functional projections which encode functions like Aspect can be lexicalized either by adverbs or affixes. Therefore, it is not very clear which functional projections may accommodate modifier PPs. One may imagine that some of the modifier PPs, like a Temp PP, can be related to the functional head manifested by the Temporal adverbs, which are generated in the area close to T (e.g., Nilsen 1998). There are, however, many other PP modifiers like Loc PP, Com PP, InstPP, etc, which do not seem to be semantically directly related to any of the functional heads of Cinque's hierarchy.

In this thesis, I will argue that there is a fine-grained correlation between different PP types and functors such as Aspect and Modal, in the middle field. Before discussing the correlation between PPs and functors, I will argue that modifier PPs are base-generated in a hierarchical fashion in Japanese.





# Chapter 3

## The Order of PPs in Japanese

In this chapter, I investigate the structure of modifier PPs in Japanese. Based on syntactic diagnostics, I argue that modifier PPs in Japanese are base-generated in a rigid word order. In section 1, I present a list of nine modifier PPs which I will investigate in this thesis. As diagnostics for distinguishing modifier PPs from argument PPs, I adopt selection restrictions and a ‘do so’ test. Section 2 investigates a base order of modifier PPs on the basis of syntactic diagnostics. I apply three diagnostics to all possible combinations of nine different PP types in Japanese. The diagnostics I adopt are the focus-neutral order test, the informational focus test and the quantifier scope test. The results of these tests indicate that, in Japanese, the base order of modifier PPs is rigid and that modifier PPs are arranged in a hierarchical fashion. Thus, the results of this chapter argue against Ernst’s (2002) approach to adverbials in which adverbials are freely adjoined in syntax. Rather, the results support an approach which assumes that PPs are generated in a rigid order. More precisely, the results of this chapter gives support to Schweikert’s (2005) analysis of modifier PPs. This is because the hierarchy of PP modifiers in Japanese conforms to his hierarchy of modifier PPs in German.

### 3.1 Modifier PPs in Japanese

This section provides a list of nine modifier PPs in Japanese which will then be examined with respect to four diagnostics in the next section. I adopt a ‘do so’ test and selectional restriction facts between a verb and a PP as diagnostics to distinguish the modifier PPs under investigation from argument PPs which presumably have different structure. Lastly, since some postpositions are homophonous with a Case particle, I present a diagnostic from the literature to distinguish these two (e.g., Miyagawa 1989).

### 3.1.1 Selectional relations

Since this thesis investigates the structure of modifier postpositional phrases in Japanese, I will first make it clear that the PPs that will be discussed in this chapter are modifiers and not arguments. One potential test that can be used to distinguish arguments from modifiers comes from selection relations between a verb and its constituents. Arguments are roughly defined as necessary constituents of a given proposition, based on meaning of the verb. For example, the verb ‘devour’ means something like “to eat something eagerly” in which ‘something’ is one of the necessary elements that form proposition. In this proposition, a constituent that corresponds to ‘something’ is called an argument.

There is a high degree of selectional restriction between a verb and its arguments. Whether a given verb requires one or more arguments depends on its lexical property. For example, the three verbs *devour*, *dine* and *eat* all have a similar meaning but they select their internal arguments in a different manner. *Devour* must have an argument, whereas *dine* cannot. *Eat*, on the other hand, allows the omission of its argument. The different selectional requirements of the three verbs are illustrated in (1).

- (1) a. John devoured \*(Norwegian food)  
 b. John dined (\*Norwegian food)  
 c. John ate (Norwegian food)

Modifiers are roughly defined to be constituents that are not necessary in forming a proposition. Unlike arguments, they are not sensitive to the lexical property of the verb. Consider the examples in (2). In contrast to the internal argument *Norwegian food*, the modifier instrumental PP *with a fork* can appear with any of the three verbs mentioned in (1) with the same degree of freedom.<sup>1</sup>

- (2) a. John devoured Norwegian food (with a fork).  
 b. John dined (with a fork).  
 c. John ate Norwegian food (with a fork).

The verb *devour*, for example, does not care whether an eating event takes

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<sup>1</sup>It is not true that any modifier can appear with any verb, though. There seems to be a very low selectional relation between a verb and modifiers. For example, an instrumental PP combines only with verbs that involve Agentivity as a part of their meaning.

- (i) a. John walked with a cane.  
 b. John drew a picture with a pencil.  
 c. \*John knows the fact with a book.

place with the aid of an instrument like a fork. The meaning of *devour* rather involves the sense that the eating event happens in a hungry manner. In this sense, the instrumental PP, *with a fork*, is a modifier to the proposition with the verb *devour*.

Similar to English, selection of arguments in Japanese is highly sensitive to the lexical property of an individual verb. Japanese verbs that correspond to ‘devour’ and ‘eat’ in English require an internal argument, whereas the verb that corresponds to ‘dine’ cannot have an internal argument, as illustrated in (3).<sup>2</sup>

- (3) Nani-ga   atta       no?  
       what-NOM happened Q  
       ‘What happened?’
- a. Taro-ga   \*(norwee-ryoori-o)   musaborikutta.  
    Taro-NOM   Norway-food-ACC devoured  
    ‘Taro devoured (Norwegian food).’

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<sup>2</sup>In Japanese, both arguments and adjuncts can be dropped quite freely when their descriptive contents are retrieved in discourse/pragmatics (A formal analysis of discourse pro-drop in Japanese is found Tomioka (2003)). For example, the object ‘that book’ can be deleted without making the sentence ungrammatical when it is a discourse topic, as illustrated in (i).

- (i) Taro-ga   sono hon-o   yonda. Ken-mo (sono hon-o)   yonda.  
       Taro-NOM that book-ACC read.   Ken-also that book-ACC read  
       ‘Taro read that book. Ken read (that book) too.’

If the object in (3c) and the object in (3a) are discourse topics, they can be omitted due to discourse pro-drop. In a discourse pro-drop context, therefore, it is not immediately obvious whether the verbs, *musaboriku* ‘devour’ and *tabe* ‘eat’, in (3c) and (3a) select an internal argument.

In order to avoid a pro-drop construction, I use a general question-answer pair, as schematized in (ii).

- (ii) Nani-ga   atta       no?  
       what-NOM happened Q  
       ‘What happened?’
- a. #Ken-ga   yonda yo.  
    Ken-NOM read   PRT  
    ‘Ken read (it).’
- b. Ken-ga   hon-o   yonda yo.  
    Ken-NOM book-ACC read   PRT  
    ‘Ken read a book.’

The question in (ii) requires an answer whose focus domain is an IP; all constituents of the IP must carry new information. In this context, an object carries new information, and hence pro-drop of the object is not allowed.

- b. Taro-ga (\*norwee-ryoori-o) shokuzi-shita.  
 Taro-NOM Norway-food-ACC dine-did  
 ‘Taro dined (\*Norwegian food).’
- c. Taro-ga \*(norwee-ryoori-o) tabeta.  
 Taro-NOM Norway-food-ACC ate  
 ‘Taro ate (Norwegian food).’

Unlike the selection of an argument, the selection of a modifier in Japanese is not sensitive to the lexical property of a verb. An instrumental PP *fooku-de* ‘with a fork’ can appear with any of the three verbs in (3).

- (4) a. Taro-wa (fooku-de) norwee-ryoori-o musaborikutta.  
 Taro-TOP fork-INST Norway-food-ACC devoured  
 ‘Taro devoured Norwegian food (with a fork).’
- b. Taro-wa (fooku-de) shokuzi-shita.  
 Taro-TOP fork-INST dine-did  
 ‘Taro dined (with a fork).’
- c. Taro-wa (fooku-de) norwee-ryoori-o tabeta.  
 Taro-TOP fork-INST Norway-food-ACC ate  
 ‘Taro ate Norwegian food (with a fork).’

I will use selectional relation between a verb and its constituents as a test to distinguish modifiers from arguments.

### 3.1.2 ‘Do so’ test

Another test that can be used to distinguish modifiers from arguments is the ‘do so’ test. In English, a VP can be substituted by the pro-form *do so*.

- (5) a. John ate Norwegian food, and Mary did so too.  
 b. \*John ate Norwegian food, and Mary did so Norwegian food too.

As the ungrammaticality of (5b) indicates, *do so* cannot substitute just the verb *ate*, leaving out the argument *Norwegian food*. Rather, it must substitute the whole VP including the verb’s internal argument.

Unlike arguments, instrumental PPs can be excluded from the ‘do so’ substitution. Consider the example in (6).

- (6) John ate Norwegian food [*Inst* with a fork], and Mary did so [*Inst* with chopsticks].

In (6), *do so* replaces the VP *ate Norwegian food*, leaving the instrumental PP behind. Assuming that the *do so* substitution cannot leave an argument behind, the fact that the instrumental PP can be left behind indicates that it is not an argument but a modifier.

The same test can be applied to Japanese. Nakau (1973) observes that the pro-form *soo su(-ru)* ‘do so’ has to replace a VP, not just a verb.

- (7) Taro-wa norwee-ryoori-o tabeta.  
 Taro-TOP Norway-food-ACC ate  
 ‘Taro ate Norwegian food.’
- a. Ziroo-mo soo si-ta.  
 Ziro-too so do-past  
 ‘Ziro did so too.’
- b. \*Ziroo-mo norwee-ryoori-o soo si-ta.  
 Ziro-too Norway-food-ACC so do-past  
 ‘Ziro did so Norwegian food too.’

In a construction with an instrumental PP, the instrumental PP can be left behind after the *soo su* ‘do so’ substitution.

- (8) Taro-wa fooku-de norwee-ryoori-o tabeta. Ziroo-mo hashi-de  
 Taro-TOP fork-INST Norway-food-ACC ate Ziro-too chopsticks-INST  
 soo si-ta.  
 so do-past  
 ‘Taro ate Norwegian food with a fork. Ziro did so with chopsticks too.’

By applying the same logic as was applied to the English ‘do so’ test, the fact that the instrumental PP *hashi-de* ‘with chopsticks’ can be left behind in the ‘do so’ substitution in Japanese indicates that the instrumental PP in (8) is not an argument.

### 3.1.3 The list of modifier PPs under examination

In (9), I present a non-exhaustive list of modifier PPs in Japanese which I will investigate.<sup>3</sup> I adopt the two aforementioned tests, selectional relation and ‘do so’ test, as diagnostics for the modifiers.

- (9) The list of modifier PPs in Japanese

1. Temporal *ni, kara*

- (10) a. Taro-ga 6 zi-ni okiru.  
 Taro-NOM 6 hour-TEMP wake.up  
 ‘Taro wakes up at 6 o’clock.’
- b. Taro-ga asa-kara ban-made hataraku.  
 Taro-NOM morning-SOURCE evening-until work  
 ‘Taro works from the morning to the evening.’

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<sup>3</sup>For a classification of prepositions in Japanese, see Soejima (2003)

2. Locative *de*

- (11) Taro-ga gakkō-de benkyō-suru.  
 Taro-NOM school-LOC study-do  
 ‘Taro studies at school.’

3. Comitative *to*

- (12) Hanako-ga Taro-to eega-ni iku.  
 Hanako-NOM Taro-COM movie-GOAL go  
 ‘Hanako goes to the movies with Taro.’

4. Reason *de, kara*

- (13) a. Taifuu-de zyūgyō-ga kyūukō-ni natta.  
 typhoon-REA class-NOM cancelation.class-RESULT became  
 ‘The classes were canceled because of the typhoon.’  
 b. Taro-ga kuufuku-kara pan-o nusunda.  
 Taro-NOM hunger-REA bread-ACC stole  
 ‘Taro stole bread from hunger.’

5. Source *kara*

- (14) Taro-ga yane-kara kamihikōki-o tobashita.  
 Taro-NOM roof-SOURCE paper.plane-ACC flew  
 ‘Taro flew a paper plane from the roof.’

6. Goal<sub>space</sub> *ni*

- (15) Taro-ga Mary-ni denshōbato-o tobashita.  
 Taro-NOM Mary-GOAL carrier.pigeon-ACC flew  
 ‘Taro sent a message to Mary by carrier pigeon.’

7. Instrumental/Means *de*

- (16) Taro-ga pasokon-de shorui-o tsukuru.  
 Taro-NOM PC-INST materials-ACC make  
 ‘Taro makes materials with a PC.’  
 (17) Taro-ga fukushikikōkyū-hō-de daietto-o shita.  
 Taro-NOM abdominal.breathing-means diet-ACC did  
 ‘Taro lost weight by the abdominal breathing methods.’

8. Material *de, kara*

- (18) Taro-ga sake-o kome-kara tsukuru.  
 Taro-NOM sake-ACC rice-MAT make  
 ‘Taro makes sake from rice.’

9. Manner *de* : A manner in which a certain action takes place.

- (19) Taro-ga teeneena/kidotta monogoshi-de hanashita.  
 Taro-NOM polite/grand manner-MANNER spoke  
 ‘Taro spoke in a polite/grand manner.’

The table in (20) illustrates which postposition is associated with which morpheme.

(20)

PP \ morpheme	<i>ni</i>	<i>to</i>	<i>kara</i>	<i>de</i>
Temporal	x		x	
Locative				x
Comitative		x		
Reason			x	x
Source			x	
Goal	x			
Instrumental/Means				x
Material			x	x
Manner				x

With regard to the labeling of the postposition types, I adopt Schweikert’s (2005) terminology for PPs. The list of Japanese postpositions in (20) does not contain Evidential, Benefactive, Malefactive, Path and Matter, which Schweikert included in his study of prepositions in German. In Japanese, these functions are manifested by complex morphology that consists of a postposition and a verbal element, as illustrated in (21).

- (21) a. Mokugekisha-*ni yoru to*, Taro-ga 3zi-ni sono-tatemomo-kara  
 witness-ni base COMP, Taro-NOM 3.o’clock-TEMP that-building-SOURCE  
 detekita.  
 exited  
 ‘According to the witness, Taro came out of the building at three  
 o’clock.’ (Evidential)
- b. Taro-ga Hanako-\*(*no tame*)-*ni* hashitta.  
 Taro-NOM Hanako- GEN benefit-ni ran  
 ‘Taro ran for the benefit of Hanako’ (Benefactive)

- c. Taro-ga gengogaku-*ni tsuite* kooen-o shita.  
Taro-NOM linguistic-ni concerning lecture-ACC did  
'Taro gave a lecture on linguistics.' (Matter)
- d. Taro-ga tonneru-o *toot.te* Aomori-ni itta.  
Taro-NOM tunnel-ACC go.through.ASP Aomori-GOAL went  
'Taro went to Aomori through the tunnel.' (Path)

For example, in (21d), the 'Path' function is expressed by a verbal phrase of some sort or a gerund form of *too-ru* 'go through', and the Ground is marked with an accusative marker. Both the 'Evidential' and 'Matter' functions are manifested by a complex form which consists of the morpheme *ni* and a verb. The 'Benefative' in (21b) is expressed by a complex form that contains the genitive *no*, a noun and the morpheme *ni*. Since these functions all seem to be manifested by derived forms, I will not include them as examples of PPs here.

With regard to Malefactive, in most cases it appears in so-called "adversity passive" constructions.

- (22) a. Taro-ga \*(*ame-ni*) fur-are-ta.  
Taro-NOM rain-NI rain-PASS-past  
'Taro was caught in the rain.'
- b. Taro-ga \*(*Mary-ni*) asa-made piano-o hik-are-ta.  
Taro-NOM (Mary-NI) morning-until piano-ACC play-PASS-past  
'Taro was affected by Mary playing piano until the morning.'

As the stars in front of the parentheses in (22) indicate, the Malefactive phrases *ama-ni* in (22a) and *Mary-ni* in (22b) cannot be absent. In this respect, they behave more like arguments than modifiers. Therefore, I will exclude Malefactive from the list of postpositions in Japanese under investigation.

### 3.1.4 The postposition *ni* and the Dative Case *ni*

As seen in (20), most postpositions are homophonous among different postpositional functions. Furthermore, some postpositions, the Temporal postposition and the Goal postposition, are homophonous with the Dative Case particle *ni*. Distinguishing the Temporal postposition *ni* from the Dative Case particle *ni* is not very difficult. On the other hand, the distinction between the Goal postposition *ni* and the Dative *ni* is often unclear. In the next paragraphs, therefore, I discuss a test from Miyagawa (1989) which can be used to distinguish the postposition *ni* from the Dative case particle *ni*.

First, however, consider the Temporal postposition *ni* and a Dative Case particle *ni* in (23). It is not very difficult to distinguish the Temporal postposition *ni* in (23a) from the Dative Case particle *ni* in (23b) with respect to the



thematic relation that *ni* holds with its complement NP.

- (23) a. Taro-ga getsuyoobi-ni eega-o mita.  
 Taro-NOM Monday-TEMP movie-ACC watched  
 ‘Taro watched a movie on Monday.’  
 b. Taro-ga tomodach-ni hon-o ageta.  
 Taro-NOM friend-DAT book-ACC gave  
 ‘Taro gave a book to his friend.’

It is standardly assumed that a preposition or a postposition is a category that has a semantic content and assigns a theta role to its complement NP. According to this view, the Temporal postposition *ni* assigns a Temporal role and the complement NP that receives this role must be a temporal expression. Therefore, the Temporal *ni* may combine with a Temporal expression such as ‘Monday’ in (23a) but not with a non-Temporal NP like ‘friend’.

Distinguishing the Goal postposition *ni* from the Dative Case *ni* in terms of a thematic role, on the other hand, is not very easy. Both the NP contained in the Goal PP and the NP with the Dative Case receive a similar thematic role, i.e. the Goal, as illustrated in (24a) and (24b).

- (24) a. Taro-ga tomodach-ni denshobato-o tobashita.  
 Taro-NOM friend-GOAL carrier.pigeon-ACC flew  
 ‘Taro sent a message to his friend by carrier pigeon.’  
 b. Taro-ga tomodach-ni hon-o ageta.  
 Taro-NOM friend-DAT book-ACC gave  
 ‘Taro gave a book to his friend.’

By assumption, Case markers have no semantic content, and hence they do not assign any theta role to the NP which they attach to. Instead, the NP is assigned a theta role by its predicate. The verb *ageru* ‘give’ in (24b) assigns a Goal role. Accordingly the NP to which the Dative Case *ni* is attached to is assigned a Goal role. The Goal postposition *ni* in (24a) also gives a Goal role to its complement NP. The two instances of *ni* in (24), however, are argued to be different. Miyagawa (1989), for example, argues that the distinction between the two can be made by floating quantifiers.

Japanese has a numeral quantifier which consists of a numeral and a classifier that agrees with the type of entity being counted. For example, to count people the classifier *nin* is used as in *san nin* ‘three people’. Numeral quantifiers may appear pre-nominally connected to an NP by the Genitive Marker *no*, as illustrated in (25).

- (25) *Sannin-no* [<sub>NP</sub> *gakusee-ga*] *sake-o* *nonda*.  
 three.cl-GEN student-NOM sake-ACC drank  
 ‘Three students drank sake.’

Numeral quantifiers may also appear post-nominally, as in (26a). Numeral quantifiers in the post-nominal position can be syntactically separated from their hosting nouns by other constituents like an adverb in (26b). Numerals like the one in (26b) are called floating (numeral) quantifiers.

- (26) a. [<sub>NP</sub> Gakusee-ga] *sannin* sake-o nonda.  
 student-NOM three.cl sake-ACC drank  
 ‘Three students drank sake.’  
 b. [<sub>NP</sub> Gakusee-ga] kinoo *sannin* sake-o nonda.  
 student-NOM yesterday three.cl sake-ACC drank  
 ‘Three students drank sake yesterday.’

Miyagawa (1989) argues that there is a mutual c-command restriction between a numeral quantifier and a noun modified by it. Consider (27).

- (27) a. [<sub>NP</sub> Gakusee-ga] *sannin* Sinzyuku-de Tanaka sensei-ni  
 student-NOM three.cl Sinzyuku-LOC Tanaka professor-DAT  
 atta.  
 met  
 ‘Three students met professor Tanaka in Shinzyuku.’  
 b. \* [<sub>NP</sub> Gakusee-ga] Sinzyuku-de Tanaka sensei-ni *sannin*  
 student-NOM Sinzyuku-LOC Tanaka professor-DAT three.CL  
 atta.  
 met  
 ‘Three students met professor Tanaka in Shinzyuku.’  
 c. \* [<sub>NP</sub> Tomodachi-no kuruma]-ga *sannin* koshoo-shita.  
 friend-GEN car-NOM three.CL broke.down  
 ‘Three friends’ car broke down.’

In (27b), the numeral quantifier *sannin* is deeply embedded in the VP and, hence, does not c-command the counted NP *gakusee* ‘students’ which is in the subject position. Miyagawa analyzes (27c) as a numeral quantifier cliticized to a sentential node IP and, thus, c-commanding the counted NP *tomodachi* ‘friends’. The counted NP, however, is embedded in another NP, and thus it does not c-command the numeral quantifier. Based on these two examples, he argues that a mutual c-command condition must hold between an NP and its numeral quantifier.

Given the mutual c-command condition between an NP and its floating quantifiers, postposition *ni* and the Dative *ni* can be distinguished. Consider the examples in (28) and (29). The Dative NP *gakusee-ni* in (28a) allows a floating quantifier as in (28b), whereas a PP headed by *ni* like *kooen-ni* in (29a) does not, as in (29b).

- (28) a. Taro-ga *sannin-no* gakusee-ni hon-o ageta.  
 Taro-NOM threeCL-GEN student-DAT book-ACC gave

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- ‘Taro gave a book to the three students.’
- b. Taro-ga [<sub>NP</sub> gakusee]-ni sannin hon-o ageta.  
 Taro-NOM student-DAT threeCL book-ACC gave  
 ‘Taro gave a book to the three students.’
- (29) a. Kodomotachi-wa [<sub>PP</sub> futatu-no [<sub>NP</sub> kooen]-ni] itta.  
 children-TOP two.cl-GEN park-GOAL went  
 ‘The children went to two parks.’
- b. \*Kodomotachi-wa [<sub>PP</sub> [<sub>NP</sub> kooen]-ni] futatu itta.  
 children-TOP park-GOAL two.cl went  
 ‘The children went to two parks.’ (Miyagawa 1989: 36)

Due to the difference in grammaticality between (28b) and (29b), Miyagawa (1989) argues that an NP with a postposition projects a PP, whereas an NP with a Case particle is just an NP onto which the Case particle cliticizes.

Let us now reconsider (24a). With respect to the floating quantifier, the NP followed by *ni* in (24a) patterns with the PP in (29b). The relevant example is repeated in (30) with a floating quantifier.

- (30) \*Taro-ga tomodachi-ni kinoo sannin denshobato-o tobashita.  
 Taro-NOM friend-GOAL yesterday 3.CL carrier.pigeon-ACC flew  
 ‘Taro sent a message to the three friends by a carrier pigeon yesterday.’

The ungrammaticality of (30), then, indicates that *ni* in (30) is a Goal postposition, while *ni* in (24b) is a Dative Case particle. The availability of a floating quantifier thus can successfully distinguish a Goal postposition from the Dative Case.

## 3.2 Diagnostic for the PP order (I): Focus-neutral order

Japanese allows scrambling to rearrange the order of constituents. Due to scrambling, it is often unclear whether a surface word order is a base order or a derived order. For example, when a Temp PP and a Comitative PP cooccur, both the Temp PP-Com PP order and the Com PP-Temp PP order are fine, as illustrated in (31).

- (31) a. Taro-wa [<sub>Temp</sub> kinyoo-no ban-ni] [<sub>Com</sub> tomodachi-to] sukiyaki-o  
 Taro-TOP Friday-GEN night-TEMP friends-COM sukiyaki-ACC  
 tabeta yo.  
 ate PRT  
 ‘Taro ate sukiyaki with his friends on Friday night.’

- b. Taro-wa [<sub>Com</sub> tomodachi-to] [<sub>Temp</sub> kinyoo-no ban-ni] sukiyaki-o  
 Taro-TOP friends-COM Friday-GEN night-TEMP sukiyaki-ACC  
 tabeta yo.  
 ate PRT  
 ‘Taro ate sukiyaki with his friends on Friday night.’

In what follows, I will present diagnostics that help detect the base order of combinations of different PP types. The diagnostics include focus-neutral order, informational focus and scope ambiguity.<sup>4</sup> Based on the results of these tests, I will propose a hierarchy of modifier postpositions in Japanese.

### 3.2.1 Background: A configurational vs. movement approach to scrambling

As demonstrated by the examples in (31), Japanese allows flexible word order due to scrambling. If a scrambled word order is derived from an underlying order by a movement operation, the word order before scrambling can safely be assumed to be the base order. In this section, I will investigate a focus-neutral order among different types of PPs. I argue that this order is, in fact, the underlying word order.

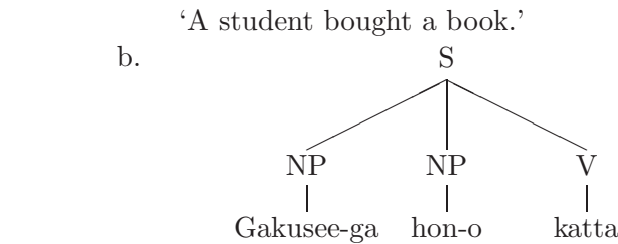
Before discussing the focus-neutral order test, I will summarize arguments in favor of a configurational approach to Japanese scrambling, which I will adopt in this thesis. I reject a non-configurational approach because under this approach, there is no hierarchy of constituents. Additionally, both a scrambled word order and a non-scrambled word order are base-generated by a phrase structure rule. This approach, therefore, does not assume that PPs are structured. It goes against the approach in which PPs are base-generated in a hierarchical fashion, which I will defend in the rest of this chapter.

In the early eighties, linguists like Hale (1980) and Farmer (1984) proposed that Japanese be a non-configurational language due to the great freedom in word order. They argue that flexible word orders in Japanese are base-generated by means of a phrase structure rule, not by means of a movement operation. For example, a sentence with the SOV order and a sentence with the OSV order are analyzed as having base-generated structures, as schematized in (32b) and (33b), respectively.

- (32) an SOV order
- a. Gakusee-ga hon-o katta.  
 student-NOM book-ACC bought

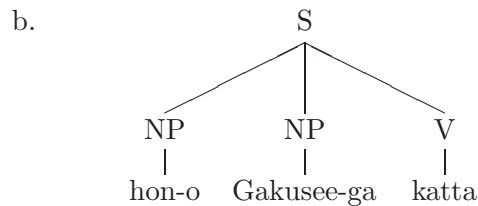
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<sup>4</sup>A VP-fronting test and a binding test, which show a restricted word order of PPs in other languages such as English and Norwegian (e.g., Pesetsky 1995 and Nilsen 1998), do not give clear results in Japanese. These tests are therefore not adopted here.



(33) an OSV order

- a. Hon-o    gakusee-ga    katta.  
 book-ACC student-NOM bought  
 'A book, a student bought.'



Under the non-configurational analysis, all the building blocks of the sentence like the subject NP, the object NP and the verb in (32) and (33) are generated directly under the S node. In such a structure, the object NP and the verb do not constitute a VP node.

The non-configurational analysis was criticized by a number of Japanese linguists (e.g., Saito and Hoji 1983, Saito 1985, Hoji 1985 among others). On the basis of the various subject/object asymmetries and the notion of c-command, Saito (1985, 1989), for example, argues that Japanese has a VP-node, and hence is a configurational language. One piece of evidence for the existence of the VP node comes from pronominal coreference. A relevant paradigm in English in (34) is taken from Saito (1985:36).

- (34) a. John<sub>i</sub> loves his<sub>i</sub> mother.  
 b. \*He<sub>i</sub> loves John<sub>i</sub>'s mother.  
 c. John<sub>i</sub>'s mother loves him<sub>j</sub>.  
 d. His<sub>i</sub> mother loves John<sub>i</sub>.

Saito argues that the paradigm in (34) can be explained by the condition of Binding Theory in (35) (cf. Chomsky 1981).<sup>5</sup>

- (35) A pronoun cannot c-command its antecedent. (Saito 1985: 36)

<sup>5</sup>Saito (1985) states that this condition can be considered as part of a more general principle suggested in Higginbotham (1983).

- (i) If X c-commands Y, then Y is not an antecedent of X.

The notion of *c-command* plays a crucial role here. The definition of *c-command* which Saito adopts is taken from Reinhart (1979).

- (36) X *c-commands* Y if neither X nor Y dominates the other and the first branching node dominating X dominates Y. (Reinhart 1979)

Given these assumptions, Saito's explanation for the paradigm is as follows: in (34a), the pronoun *his* is embedded under the NP node, from where it cannot *c-command* its antecedent *John*. (34a) is thus grammatical. The example in (34d) points out that precedence is not relevant here; the pronoun *his* precedes its antecedent *John* but it does not *c-command* *John* because it is embedded in the subject NP. The sentence in (34d) thus does not violate the condition in (35), and accordingly, it is grammatical. Saito claims that the existence of the VP node is crucial in order to explain the grammaticality of (34c). In (34c), due to the VP node which is assumed to exist in English, the object pronoun *him* does not *c-command* the subject *John* which is outside the VP.

Saito (1985) states that the paradigm in (34) makes a prediction that a language without a VP node should allow the construction that corresponds to (34b). Following the observation made by Whitman (1982/1987), Saito (1985) points out that this prediction is not borne out in Japanese.

- (37) a. John<sub>i</sub>-ga [Mary-ga kare<sub>i</sub>-ni okutta tegami]-o made yonde  
John-NOM Mary-NOM he-to sent letter-ACC yet read  
inai (koto).  
not fact  
'(the fact that) John has not yet read the letter Mary sent him.'
- b. \*Kare<sub>i</sub>-ga [Mary-ga John<sub>i</sub>-ni okutta tegami]-o made yonde inai  
he-NOM Mary-NOM John-to sent letter-ACC yet read not  
(koto).  
fact  
'(the fact that) he has not yet read the letter Mary sent John.'
- c. [John<sub>i</sub>-kara okane-o moratta hito]-ga kare<sub>i</sub>-o suisenshita  
John-from money-ACC received person-NOM he-ACC recommended  
(koto).  
fact  
'(the fact that) the person who received money from him recommended him.'
- d. [Kare<sub>i</sub>-kara okane-o moratta hito]-ga kare<sub>i</sub>-o suisenshita  
he-from money-ACC received person-NOM he-ACC recommended  
(koto).  
fact  
'(the fact that) the person who received money from him recommended him.'

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If Japanese had a non-configurational structure without a VP node, the object pronoun *kare-o* ‘him’ in (37c) would c-command its antecedent *John*, and accordingly, the sentence would be excluded by the condition of the Binding Theory in (35). Saito (1985) argues that the grammaticality of the sentence rather demonstrates the existence of a VP in Japanese. Thus, the existence of a VP node supports that Japanese is a configurational language.

Based on evidence from pronominal coreference, Saito (1985) further argues that a scrambled word order is derived from the base order by movement. For example, he argues that the OSV order is derived from the SOV order by means of movement. A relevant minimal pair in (38) is taken from Saito (1985: 40).

- (38) a. \**Kare<sub>i</sub>-ga* [*Mary-ga John<sub>i</sub>-ni okutta tegami*]-*o made yonde inai*  
 he-NOM Mary-NOM John-to sent letter-ACC yet read not  
 (koto).  
 fact  
 ‘(the fact that) he has not yet read the letter Mary sent John.’  
 (= (37b))
- b. [*Mary-ga John<sub>i</sub>-ni okutta tegami*]-*o kare<sub>i</sub>-ga made yonde inai*  
 Mary-NOM John-to sent letter-ACC he-NOM yet read not  
 (koto).  
 fact  
 ‘(the fact that) the letter Mary sent John, he has not yet read.’

As seen in (37b), which is repeated in (38a), the subject pronoun *kare* ‘he’ c-commands its antecedent. Accordingly the sentence is excluded due to the violation of the condition of Binding Theory in (35). On the other hand, when the subject pronoun ‘he’ is preceded by the object ‘the letter Mary sent’, as in (38b), the sentence is perfectly grammatical. This means that in the OSV order in (38b), the subject pronoun does not c-command its antecedent *John*, which is embedded in the object. In other words, in the OSV order, the object is in the position higher than the subject. Assuming that the SOV order is the base order, Saito (1985) argues that the grammaticality of (38b) suggests that ‘the letter Mary sent’ moves to the position above the subject ‘he’ by a movement operation. As a result, the subject pronoun ‘he’ does not c-command its antecedent any longer. Thus, he argues, scrambling is a movement operation.

In this thesis, I follow Saito’s movement analysis of scrambling and assume that different surface orders among PPs are created by means of movement.<sup>6</sup>

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<sup>6</sup>It has also been suggested that scrambling is a “stylistic” movement (Ross 1986, Chomsky and Lasnik 1977). Chomsky and Lasnik (1977), for example, assume that scrambling applies at PF and therefore it does not have any semantic effects. Saito’s (1989) argument from pronominal coreference demonstrates that scrambling changes a c-command relation between two arguments. Assuming that c-command does not

### 3.2.2 Scrambling with semantic effects

In this thesis, I assume that scrambling has certain semantic/discourse effects (cf. Ishihara 2000). Since it is often argued in the literature that Japanese scrambling is semantically vacuous (e.g., Saito 1989; 1992), one may claim that the assumption I adopt is incompatible with Saito's approach. In this subsection, I will show that the semantic effects which I assume are different from the semantic effects that Saito assumes and hence they are not incompatible with each other. Saito argues that scrambling does not establish a semantically significant operator-variable relation, whereas I will argue that scrambling changes the information structure of a clause. In what follows, I will first give a short description of the semantic effects argued by Saito (1989). Then, I will discuss the semantic/discourse effect which scrambling gives rise to, i.e. it changes information structure of a clause.

Saito argues that unlike other syntactic movement like *wh*-movement, scrambling can be freely undone at LF, i.e., scrambling can reconstruct. The following paragraphs demonstrate his point. In the literature, it is observed that the traces created by LF *wh*-movement are subject to the Proper Binding Condition, which states that traces must be bound (cf. Fiengo 1977). Consider the examples in (39). The embedded CP, CP<sub>2</sub>, has a Question morpheme (henceforth Q morpheme) *ka* and hence is assumed to be a [+*wh*] CP. By assumption, a *wh*-phrase is required to be in the specifier position of the [+*wh*] CP at LF. This is due to the condition on the interpretation of *wh*-phrases, call it the Q-requirement for the sake of convenience. Due to the Q-requirement, the *wh*-phrase *dare-ga* in (39a,b) must be in the specifier of CP<sub>2</sub> at LF.

- (39) a. [<sub>CP1</sub> John-ga [<sub>CP2</sub> dare-ga sono hon-o katta ka] shiritagatteiru].  
           John-NOM           who-NOM that book-ACC bought Q want.know  
           ‘John wants to know who bought that book.’  
       b. \* [<sub>CP1</sub> Dare-ga [<sub>CP2</sub> John-ga sono hon-o katta ka] shiritagatteiru].  
           who-NOM           John-NOM that book-ACC bought Q want.know  
           ‘Who wants to know John bought that book.’

In (39a), the *wh*-phrase *dare-ga* moves to spec,CP<sub>2</sub> at LF, satisfying the Q requirement. *Dare-ga* in spec,CP<sub>2</sub> c-commands its trace (which is presumed to be in spec,T in a standard analysis), satisfying the Proper Binding Condition. On the other hand, in order to satisfy the Q requirement, the matrix *wh*-subject *dare-ga* in (39b) must move to the specifier of the embedded CP, CP<sub>2</sub>, at LF. After this LF movement of *dare-ga* into the CP<sub>2</sub> in (39b), the trace of *dare-ga* in the matrix clause is not bound by its antecedent. The sentence is therefore excluded by the Proper Binding Condition.

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have anything to do with PF, one can conclude that scrambling applies in syntax, not at PF.



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Saito (1985; 1989; 1992) argues that unlike LF wh-movement, scrambling is not subject to the Proper Binding Condition. He observes that a wh-phrase can be scrambled to a position outside the CP headed by the associated Q morpheme, without giving rise to ungrammaticality.

- (40) a.  $[_{CP1}$  John-ga  $[_{CP}$  Mary-ga dono hon-o yonda ka] siritagatteiru.  
           John-NOM     Mary-NOM which book-ACC read   Q   want.know  
           ‘John wants to know Mary read which book.’
- b.  $?[_{CP1}$  Dono hon<sub>i</sub>-o John-ga  $[_{CP}$  Mary-ga t<sub>i</sub> yonda ka] siritagatteiru.  
           which book   John-NOM     Mary-NOM t read   Q   want.know  
           ‘Which book, John wants to know Mary read.’

In the sentence without scrambling in (40a), the wh-object *dono hon-o* ‘which book’ is in CP2, both in the surface structure and at LF, satisfying the Q-requirement. In the scrambled sentence in (40b), the scrambled wh-object *dono hon-o* must be in the specifier of the CP2 at LF due to the Q-requirement. Although (40b) is a bit degraded, it is much better than (39b) which violates the Proper Binding Condition. The grammaticality of the sentence in (40b) indicates that a scrambled argument can be reconstructed back to its base-position without leaving a trace. This means that scrambling does not create an operator-variable relation, unlike wh-movement. Since the operator-variable relation is calculated at LF, which is a semantic component, Saito argues that scrambling does not have semantic effects.

It is not entirely correct, however, that scrambling has no semantic effects. That scrambling has certain semantic effects is supported by the fact that a scrambled sentence shows scope ambiguity (Kuroda 1970, Kuno 1973, Hoji 1985). Kuroda (1970) observes that the surface order of quantificational elements affects their scope relation. He observes that in the S-O-V order, in which both the subject and the object are quantificational elements, the subject unambiguously takes a higher scope in relation to the object, while in the inverse order, the scope order is ambiguous, as schematized in (41). (The sentences that illustrate the scope patterns in (41) are found in (65) and (66) in the Quantifier Scope section.)

- (41) a. S O V (S > O, \*O > S)  
       b. O S V (S > O, O > S)

Given that the SOV order is the base order, the OSV order is a derived order by scrambling, the fact that the scrambled OSV order shows scope ambiguity suggests that scrambling has semantic effects.

The same point can be made on the basis of a ditransitive construction with quantificational objects. Different orders between two objects in a ditransitive construction also exhibit an asymmetry in terms of scope (Hoji 1985). Hoji (1985) observes that when an indirect object (henceforth IO) precedes a direct

object (henceforth DO), the sentence obtains only a wide scope reading of the IO with respect to the DO.

- (42) John-ga [<sub>most</sub> hotondo-no hito-ni] [<sub>2</sub> sukunakutomo futatsu-no  
 John-NOM most-GEN people-DAT at-least two-GEN  
 ronbun-o] ageta.  
 article-ACC gave  
 ‘John gave most people at least two articles.’  
 OK:  $\text{Most}_x$  at least  $2_y$ ,  $\text{read}(j, x, y)$  ‘For most people  $x$ . there are at  
 least two articles  $y$  such that John gave  $x$   $y$ .’  
 NO: At least  $2_y$   $\text{most}_x$ ,  $\text{read}(j, x, y)$  ‘There are at least two articles  $y$   
 such that John gave  $x$  to most people  $y$ .’

When the sentence has the DO-IO order, however, a flexible scope relation is obtained; the IO takes either wide or narrow scope with respect to the DO.

- (43) John-ga [<sub>2</sub> sukunakutomo futatsu-no ronbun-o] [<sub>most</sub> hotondo-no  
 John-NOM at-least two-GEN article-ACC most-GEN  
 hito-ni] ageta.  
 people-DAT gave  
 ‘John gave most people at least two articles.’  
 OK:  $\text{Most}_x$  at least  $2_y$ ,  $\text{read}(j, x, y)$  ‘For most people  $x$ . there are at  
 least two articles  $y$  such that John gave  $x$   $y$ .’  
 OK: At least  $2_y$   $\text{most}_x$ ,  $\text{read}(j, x, y)$  ‘There are at least two articles  $y$   
 such that John gave  $x$  to most people  $y$ .’

Assuming Saito’s movement analysis of scrambling, either the DO-IO order or the IO-DO order can be a derived order by movement. Ignoring what the base order in a ditransitive construction is at the moment, the asymmetry between the DO-IO order and the IO-DO order with respect to scope strongly suggests that scrambling is a movement operation that has certain semantic effects.

### 3.2.3 Ishihara (2000)

In the more recent literature, scrambling is often claimed to have semantic effects (e.g., definiteness effects) in languages like German and Dutch (e.g., Meinunger 2000, Neeleman and Reinhart 1997). Meinunger (1995), for example, argues that scrambling is related to information structure, based on the observation that a scrambled argument often bears a topic function in German. Similarly, Jayaseelan (2001) proposes that in Malayalam, scrambling is movement to Topic Phrase. Similar to German and Malayalam, it has been reported that scrambling in Japanese has certain semantic/discourse effects. Ishihara (2000) argues that scrambling is related to information structure. He proposes that scrambling is an operation that creates a new focus set, i.e., a set

of focus domains, which is different from the one before scrambling takes place. In the next few paragraphs, I briefly summarize Ishihara's (2000) proposal.

Ishihara (2000) argues that focus sets are determined by an interaction among scrambling at the syntactic component, stress assignment at PF, and calculation of focus structure at LF. More precisely, in his analysis, the focus structure of a scrambled sentence is calculated at LF, based on the syntactic structure and the main stress of the sentence. Following Jackendoff (1972), Selkirk (1984), Reinhart (1995), among others, his basic assumption is that the phonological stress of a sentence is crucially related to the focus of the sentence. As a theoretical model for focus assignment, he particularly adopts Reinhart (1995) who proposes that the focus of IP is a constituent containing the main stress of the IP, as determined by the nuclear stress rule. As a stress assignment rule, Ishihara adopts a modified version of Cinque's (1993) null theory of sentential stress (Cinque 1993), which he calls the Focus rule, as schematized in (44).

- (44) The nuclear stress falls on the most deeply embedded XP.

The following paragraphs demonstrate how the focus sets of a sentence without scrambling in Japanese are determined according to the Focus rule. It is observed that in Japanese the nuclear stress of a sentence falls on the pre-verbal constituent (Ishihara 2000). For example, in the sentence in (45), the object *hon-o* is assigned a nuclear stress. (The nuclear stress is signaled by an acute accent as in *hón-o*.)

- (45) Taro-ga hón-o katta.  
 Taro-NOM book-ACC bought  
 'Taro bought a book.'
- a. [<sub>IP</sub> Taro-ga [<sub>VP</sub> [<sub>DP</sub> hón-o [<sub>V</sub> t<sub>j</sub>]] katta<sub>j</sub>].  
     Taro-NOM book-ACC bought  
 'Taro bought a book.'
- b. Focus sets: IP, VP, the object DP

According to the Focus rule, the nuclear stress in sentence (45) falls on the object DP *hon-o*, which is the most deeply embedded maximal projection. Assuming that any syntactic constituents that include the element with a nuclear stress can be a focus (or focus set), either the object DP itself, VP, or IP that contains the stressed object DP *hon-o* can be the focus domain in (45a).

After scrambling of the object DP, however, the focus sets of the sentence change. Consider the sentence in which the object *hon-o* is scrambled to the sentence-initial position in (46).

- (46) a. [<sub>IP2</sub> Hon<sub>i</sub>-o [<sub>IP1</sub> Táro-ga [<sub>VP</sub> [<sub>DP</sub> t<sub>i</sub> [<sub>V</sub> t<sub>j</sub>]] katta<sub>j</sub>].  
     book-ACC Taro-NOM bought

‘A book, Taro bought.’

- b. Focus sets: IP2, IP1, the subject DP

Assuming that the verb raises to T (e.g., Koizumi (1995)) in (46), the most deeply embedded overt maximal projection, after scrambling of the object *hon-o*, is the subject DP. Hence, the subject *Taro-ga* bears the nuclear stress in the scrambled sentence and accordingly, the focus sets can be either the subject DP itself, the IP1 which contains the subject DP or the newly created IP2.<sup>7</sup> The empty VP and the object DP can no longer be included in the focus sets of the sentence. Based on (46a), in which scrambling creates new potential focus sets that are not available with the base order in (45a), Ishihara argues that scrambling has semantic/discourse effects.<sup>8,9</sup>

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<sup>7</sup>The newly created IP2 contains all the constituents of the non-scrambled sentence, i.e., the subject DP, the object DP and the verb, and therefore Ishihara (2000) argues that IP2 in (46a) denotes the same domain as IP of the non-scrambled sentence (45a). The IP2 of the scrambled sentence and the IP of the non-scrambled sentence, however, do not seem to serve as the same focus domain. Consider the examples in (i).

- (i) Nani-ga   atta       no?  
       what-NOM happened Q?  
       ‘What happened?’
- a.   [*IP* Taro-ga   [*VP* [*DP* *hón-o*   [*V* *t<sub>j</sub>*]] *katta<sub>j</sub>*].  
       Taro-NOM           book-ACC           bought  
       Taro bought a book.
- b. #[*IP2* *Hon<sub>i</sub>-o*   [*IP1* *Táro-ga*   [*VP* [*DP* *t<sub>i</sub>* [V *t<sub>j</sub>*]]] *katta<sub>j</sub>*].  
       book-ACC           Taro-NOM                           bought  
       ‘A book, Taro bought.’

The general question in (i) requires an answer whose focus domain is the entire IP. According to Ishihara, (ib) is a good answer to the question in (i). However, I strongly feel that the sentence in (ib) is not an appropriate answer to the question in (i). If my intuition is correct, the non-availability of the scrambled sentence in (ib) as an answer may indicate that the IP2 in (46a) and the IP in (45a) do not serve as the same focus domain.

<sup>8</sup>I assume that the Focus assigning rule of Reinhart (1995) applies at the PF-Syntax interface, not at LF. If it applied at LF, the focus set after scrambling should be identical to the one before scrambling, assuming the radical reconstruction effects of scrambling.

<sup>9</sup>More recently, Chomsky (1999) proposes that scrambling is feature driven movement and that a scrambled constituent moves to spec-v to check the (EPP) feature of the v. Since spec-v is associated with a sort of definiteness under his theory, the scrambled constituent will receive a givenness interpretation. In this sense, scrambling has a semantic/pragmatic effect.

### 3.2.4 Application of the test to Japanese

According to the scrambling proposal of Ishihara (2000), “marked order” with respect to the information structure (or the word order with newly created focus sets that are not available with the base order) is a derived order obtained by movement of non-focal arguments. On the other hand, “unmarked order” (or the word order without the newly created focus sets) is the base-generated word order. Following this line of thinking, I assume that the unmarked word order, in terms of information structure or focus-neutral order, is the base order. Accordingly, I take the PPs with a focus-neutral order as the base order.

One way to detect the focus-neutral order is to use a general question. A general question and an answer pair is standardly used as a diagnostic for focus-neutral structures. Consider the non-scrambled sentence in (47a) and the sentence with a scrambled object in (47b) as answers to the question in (47).

- (47) Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 Please tell us about Taro.
- a.  $[IP_1 \text{ Taro-wa } [VP [DP \text{ hón-o } [V \text{ t}_j]] \text{ katta}_j]$ .  
     Taro-TOP           book-ACC   t   bought  
     ‘Taro bought a book.’
- b.  $\#[IP_2 \text{ Hon}_i\text{-o } [IP_1 \text{ Táro-wa } [VP [DP \text{ t}_i [V \text{ t}_j]] \text{ katta}_j]$ .  
     book-ACC       Taro-TOP           t   t   bought  
     ‘A book, Taro bought.’

As an answer to the question in (47), (47a), but not (47b), is well-formed. If we assume that an answer to the general question in (47) is a focus-neutral sentence, (47a), but not (47b), is the focus-neutral sentence. Given that a focus-neutral order is a base order, the order in (47a) is assumed to be the base order.<sup>10</sup> Based on the data set above, I assume that a general question like (47) requires a sentence that does not involve scrambling as an answer. I will use this as a test to detect the base order of PPs.

Before discussing word orders in the PP domain, I will first consider the focus-neutral order between an indirect object (IO) and a direct object (DO)

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<sup>10</sup>In Ishihara’s analysis, the non-scrambled sentence in (47a) has the object DP, VP, and IP1 as a focus set. This sentence is therefore appropriate as an answer to the question in (47) which requires an answer whose focus set is a VP. On the other hand, in sentence (47b), the object DP is scrambled to the sentence-initial position. Since the verb is assumed to move to T, there is nothing left in the VP. The new focus set of this sentence contains, the subject DP which is assigned a nuclear stress, IP1 and IP2. This sentence therefore is not appropriate as an answer to the question in (47). Thus, in his analysis, the scrambled sentence in (47b) is excluded as an answer to a question which requires a focus-neutral VP as an answer.

in a ditransitive construction. I do this because a focus-neutral construction in a ditransitive construction shows that a focus-neutral order is the base order. Given that IO-DO is an underlying order in a ditransitive construction in Japanese (e.g., Hoji 1985), the assumption that a focus-neutral order is a base order leads to the predication that the IO-DO order, but not the DO-IO order, would be allowed as an answer to a general question. This prediction is confirmed. In the ditransitive construction shown in (48), the answer with the IO-DO order is preferred to the DO-IO order. An acute accent signals a nuclear stress in (48a) and (48b).

- (48) Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’
- a. Taro-wa kinoo [<sub>VP</sub> Mary-ni okáne-o agemashita].  
 Taro-TOP yesterday Mary-DAT money-ACC gave  
 ‘Taro gave Mary money yesterday.’
- b. ?Taro-wa kinoo okane<sub>i</sub>-o [<sub>VP</sub> Máry-ni t<sub>i</sub> agemashita].  
 Taro-TOP yesterday money-ACC Mary-DAT gave  
 ‘Taro gave money to Mary yesterday.’

The sentence in (48a) with the IO-DO order is a legitimate answer to the question in (48). In contrast, the sentence in (48b) with the DO-IO order is awkward as an answer to the question in (48). (48b), on the other hand, is a perfect answer to a constituent question whose focus is a DO, as illustrated in (49).

- (49) a. Taro-ga kinoo dare-ni okane-o ageta no?  
 Taro-NOM yesterday who-dat money-ACC gave Q  
 ‘Whom did Taro give money yesterday?’  
 Taro-wa kinoo okane-o Máry-ni agemashita.  
 Taro-TOP yesterday money-ACC Mary-DAT gave  
 ‘Taro gave money to Mary yesterday.’

The two data sets above demonstrate that the IO-DO order is a focus-neutral order and the DO-IO order is not. Given that the IO-DO order is the base order also argued for in the literature (e.g., Hoji 1985) for independent reasons, it is safe to assume that the focus-neutral order is the base order.

Let us now consider modifier PPs, a Temp PP and a Com PP, as an example. Similar to the two objects in a ditransitive construction, the two PPs exhibit a preference in the word order in a focus-neutral context as shown in (50).

- (50) Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’

- a. Taro-wa [*Temp* kinyoobi-ni] [*Com* tomódachi-to] koobe-ni  
 Taro-TOP Friday-TEMP friends-COM Kobe-GOAL  
 ikimashita.  
 went  
 ‘Taro went to Kobe with his friend on Friday.’
- b. ?Taro-wa [*Com* tomodachi-to] [*Temp* kinyoobi-ni] koobe-ni  
 Taro-TOP friends-COM Friday-TEMP Kobe-GOAL  
 ikimashita.  
 went  
 ‘Taro went to Kobe with his friend on Friday.’

If a question triggers a focus-neutral order as an answer (50), an answer with a Temp-Com order (50a) is preferred to an answer with a Com-Temp order in (50b). Assuming that the preferred order in a focus-neutral construction is the base order, the base order between a Temp PP and a Com PP must be the Temp PP preceding the Com PP, as schematized in (51).

(51) Temp PP > Com PP

I use this test as a tool to search for the base order between constituents. I have applied this test to PP modifiers of different types in Japanese. Since the question-answer pairs which I investigated form a huge amount of data sets, I presented the Temp-Com pair as an example. I provide more data sets in the Appendix I.<sup>11</sup> The results of the application of the focus-neutral order test to the whole range of different PP combinations will be discussed in more detail towards the end of this chapter. Before closing this subsection, however, I briefly mention that the results indicate that the PPs are underlyingly arranged in a fixed order.

### 3.3 Diagnostic (II): Informational focus

In the previous chapter, I presented Schweikert’s (2005) informational focus test as a possible diagnostic for determining the underlying order of PPs. The informational test from Schweikert (2005: 77-79) is briefly summarized as follows: in German, the word order between two objects in a double object construction can be quite free due to scrambling. When informational focus is assigned to one of the objects, however, the word order between the two objects is restricted, depending on which of the objects informational focus is assigned to. If the informational focus is assigned to an IO, i.e., when an IO is questioned by a constituent question, both the IO-DO and the DO-IO orders are possible. If the informational focus is assigned to a DO, i.e., when a DO

<sup>11</sup>For reasons of formatting, Appendix I, II and III present selected examples from each test.

is questioned, only the IO-DO order is possible. The patterns of word order and informational focus in German (Schweikert 2005) are schematized in (52). (*IF* stands for informational focus.)

- (52) a. IO<sub>IF</sub> DO (German)  
 b. IO DO<sub>IF</sub>  
 c. ?DO<sub>IF</sub> IO  
 d. DO IO<sub>IF</sub>

According to Schweikert (2005), the interaction between word order and informational focus is often taken to show that IO-DO is an underlying order. More precisely, he assumes that the word order that allows flexible information focus assignment is the base order. In this thesis, I adopt Schweikert's idea (2005) and interpret the word order with the flexible informational focus assignment as the base order. In what follows, I will demonstrate that, similar to German double objects, the word order among different PP types in Japanese is restricted, depending on which PP receives informational focus.

Before discussing the word order of PPs with informational focus, however, I will first clarify that the instance of scrambling which will be discussed in this subsection is different from scrambling of non-focal argument, which is presented in the focus-neutral order section.

### 3.3.1 Focus scrambling vs. non-focus scrambling

According to Ishihara (2000), there are two types of scrambling: one is movement of a non-focal constituent (which I call non-focus scrambling), and the other is movement of a focused constituent (which I call focus scrambling). Non-focus scrambling is the instance of scrambling discussed in the section on focus-neutral order, whereas focus scrambling is the instance of the scrambling which is involved in the informational focus construction under investigation.

There are two major differences between these two types of scrambling. The first difference is observed with respect to phonological stress assignment. Ishihara (2000) shows that in non-focus scrambling, a scrambled constituent carries no phonological stress but has the effect of shifting a nuclear stress to another constituent. Consider an example of non-focus scrambling first. As demonstrated in the previous subsection, in the sentence without scrambling in (53), the object *hon-o* carries nuclear stress, which is marked by an acute accent.

- (53) [<sub>IP</sub> Taro-ga kyoo [<sub>VP</sub> [<sub>DP</sub> hón-o [<sub>V</sub> t<sub>j</sub> ] ] katta<sub>j</sub>].  
 Taro-NOM today book-ACC t bought  
 'Taro bought a book today.'

When the object *hon-o* is moved to the sentence-initial position by non-focus



scrambling, the nuclear stress is assigned to the pre-verbal adverb *kyoo*, as in (54). The moved object *hon-o* no longer carries nuclear stress. That the question in (54) requires a focus-neutral sentence as an answer indicates that the answer in (54) involves non-focus scrambling.

- (54) Q: Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’  
 A: [ $IP_2$  Hon<sub>*i*</sub>-o [ $IP_1$  Taro-ga kyóo [ $VP$  [ $DP$   $t_i$  [ $V$   $t_j$  ] ] katta<sub>*j*</sub>].  
 book-ACC Taro-NOM today bought  
 ‘A book, Taro bought today.’

Let us now consider an instance of focus scrambling in (55). The sentence in (55b) is an answer to a constituent question, and accordingly, must contain informational focus. In (55), the object moved by focus scrambling, *HON-O*, is associated with a higher pitch prominence which Ishihara calls Additional Stress. Importantly, the constituents preceded by the constituent with the Additional Stress are all deaccented. The Additional Stress is marked by capital letters, and deaccented constituents are italicized in examples.

- (55) Q: Taro-wa kyoo [ $DO$  NANI-O] katta no.  
 Taro-TOP today what-ACC bought Q  
 ‘What did Taro buy today?’  
 A: [ $IP_2$  HON-O<sub>*i*</sub>-o [ $IP_1$  Taro-ga kyoo [ $VP$  [ $DP$   $t_i$  [ $V$   $t_j$  ] ] katta<sub>*j*</sub>].  
 book-ACC Taro-NOM today bought  
 ‘A BOOK, Taro bought today.’

The second difference between the two types of scrambling is that they are associated with different types of focus. The constituent that is moved by non-focus scrambling is associated with wide focus, in which the focus sets include the subject DP,  $IP_1$  and  $IP_2$ , as in (56). On the other hand, the constituent that is moved by focus scrambling is associated with narrow focus and so the focus sets include only the object DP, as in (57).

- (56) [ $IP_2$  Hon<sub>*i*</sub>-o [ $IP_1$  Taro-ga [ $VP$  [ $DP$   $t_i$  [ $V$   $t_j$  ] ] katta<sub>*j*</sub>].  
 book-ACC Taro-NOM bought  
 ‘A book, Taro bought.’

Focus sets:  $IP_2$ ,  $IP_1$ , and the subject DP

- (57) [ $IP_2$  HON-O<sub>*i*</sub>-o [ $IP_1$  Taro-ga kyoo [ $VP$  [ $DP$   $t_i$  [ $V$   $t_j$  ] ] katta<sub>*j*</sub>].  
 book-ACC Taro-NOM today bought  
 ‘A BOOK, Taro bought today.’

Focus sets: the object DP

In sum, the differences between the two types of scrambling is that non-focus scrambling carries no phonological stress and is associated with wide

focus, while focus scrambling carries phonological stress and is associated with narrow focus.

### 3.3.2 Application of the test to Japanese

Ditransitive constructions in Japanese offer support for Schweikert's assumption that the word order that allows flexible information focus assignment is the base order. Let us therefore demonstrate the interaction between word order and informational focus assignment in a ditransitive construction, before discussing PPs.

Similar to German, in a ditransitive construction in Japanese, the IO-DO order, and not the DO-IO order, allows either object to carry informational focus. Let us first consider the examples in (58). In (58), that an IO is questioned by a constituent question indicates that the IO, not the DO, receives informational focus. When the IO carries informational focus, the IO must precede the DO, allowing only the IO-DO order.

- (58) a. Taro-wa [<sub>IO</sub> DARE-NI] hon-o ageta no.  
 Taro-TOP who-ni book-ACC gave Q  
 'To whom did Taro give a book?'  
 b. Taro-wa [<sub>IO</sub> MARY-NI] [<sub>DO</sub> hon-o] ageta yo.  
 Taro-TOP Mary-ni book-ACC gave PRT  
 'Taro gave Mary a book.'  
 c. ??Taro-wa [<sub>DO</sub> hon-o] [<sub>IO</sub> MARY-NI] ageta] yo.  
 Taro-TOP book-ACC Mary-ni gave PRT  
 'Taro gave Mary a book.'

On the other hand, when the DO is assigned informational focus in (59), the DO can either follow (59b) or precede the IO (59c), allowing both the IO-DO order and the DO-IO order.

- (59) a. Taro-wa Mary-ni [<sub>DO</sub> NANI-O] ageta no.  
 Taro-TOP Mary-ni what-ACC gave Q  
 'What did Taro give Mary?'  
 b. Taro-wa [<sub>IO</sub> Mary-ni] [<sub>DO</sub> HON-O] ageta yo.  
 Taro-TOP Mary-ni book-ACC gave PRT  
 'Taro gave Mary a book.'  
 c. Taro-wa [<sub>DO</sub> HON-O] [<sub>IO</sub> Mary-ni] ageta yo.  
 Taro-TOP book-ACC Mary-ni gave PRT  
 'Taro gave Mary a book.'

The data sets in (58) and (59) show that the focused object can precede the other object in either IO-DO or DO-IO order, as schematized in (58b) and (59c). On the other hand, the focused object can follow the other object only in the IO-DO order, as in (59b). In the DO-IO order, the focused IO cannot

follow the DO, as in (58c).

The patterns of the word order and the informational focus in ditransitive constructions in Japanese is summarized in (60).

- (60) a. IO<sub>IF</sub> DO  
 b. IO DO<sub>IF</sub>  
 c. DO<sub>IF</sub> IO  
 d. ??DO IO<sub>IF</sub>

Assuming that the IO-DO order is the base order (e.g., Hoji 1985), the pattern in (60) conforms to the patterns of word order and the information focus assignment in German in (52) to the extent that the base order allows the flexible informational focus assignment. However, there is one difference between German and Japanese with respect to the informational focus assignment. In German, the DO-IO order is fine when the IO is focused. In contrast, the DO-IO order is not allowed when the DO is focused. The situation in Japanese, on the other hand, seems to be the reverse. As the pattern in (60c) and (60d) show, in Japanese, the DO-IO order is fine when the DO is focused. The same order is disallowed when the IO is focused. Assuming that the DO-IO order is a derived order, this amounts to saying that the focused object is allowed to move across the other object, while moving the other object across the focused object is not allowed in Japanese. Thus, a tentative hypothesis based on the patterns summarized in (60) would be that scrambling of a focused constituent is permitted, whereas scrambling across a focused constituent is not.<sup>12</sup>

Ignoring the contrast between Japanese and German, in terms of which object can carry informational focus in a derived order, both Japanese and German allow flexible informational focus assignment when the surface order

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<sup>12</sup>In a certain environment, however, scrambling across a focused constituent seems to be necessary. Ishihara (2000) observes that in a multiple wh-construction, in which both a subject and a DO are wh-phrases, moving an IO across the focused subject upgrades the grammaticality of the sentence, as illustrated in (ic).

- (i) a. ?DARE-GA *Hanako-ni* NANI-o ageta *no*?  
 who-NOM Hanako-DAT what-ACC gave Q  
 ‘Who give what to Hanako?’  
 b. DARE-GA NANI-o<sub>i</sub> *Hanako-ni* t<sub>i</sub> ageta *no*?  
 who-NOM what-ACC Hanako-DAT t gave Q  
 ‘Who give what to Hanako?’  
 c. *Hanako*<sub>i</sub>-ni DARE-GA t<sub>i</sub> NANI-o ageta *no*?  
 Hanako-DAT who-NOM t what-ACC gave Q  
 ‘Who give what to Hanako?’

Ishihara (2000) argues that wh-phrases prefer to be adjacent to each other within a clause. Scrambling a non-wh IO across a wh-subject makes the wh-subject adjacent to the wh DO. Thus, scrambling across a focused constituent is not prohibited, contrary to my speculation based on the patterns in (60).

between the IO and the DO reflects their base order. The generalization, if correct, is that when the surface order is a scrambled order, only one of the objects is allowed to carry informational focus. In this sense, informational Focus can be used as a diagnostic to find out whether the given PP order is a derived order or a base order.

This test yields good results for many combinations of PPs in Japanese. Similar to double objects, a combination of different PP types in Japanese shows an asymmetry with respect to word order and informational focus. Consider the Temp-Com combination as an example. In the answers to the question in (61), informational focus is assigned to the Temp PP ‘at 5 o’clock’. Conversely, in the answers to the question in (62), information focus is assigned to the Com PP ‘with Mary’.

- (61) Q: Taro-ga [*Temp* NANZI-NI] [*Com* Mary-to] *eega-ni iku*  
 Taro-NOM what.time-TEMP Mary-COM movie-to go  
*no?*  
 Q  
 ‘What time is Taro going to the movie with Mary?’  
 A1: Taro-wa [*Temp* 5-ZI-NI] [*Com* Mary-to] *eega-ni iku yo.*  
 Taro-TOP 5-hour-TEMP Mary-COM movie-to go PRT  
 ‘Taro is going to the movie with Mary at 5 o’clock.’  
 A2: ?Taro-wa [*Com* Mary-to] [*Temp* 5-ZI-NI] *eega-ni iku yo.*  
 Taro-TOP Mary-COM 5-hour-TEMP movie-to go PRT  
 ‘Taro is going to the movie with Mary at 5 o’clock.’
- (62) Q: Taro-ga [*Temp* 5-zi-ni] [*Com* DARE-TO] *eega-ni iku*  
 Taro-NOM 5-hour-TEMP who-COM movie-to go  
*no?*  
 Q  
 ‘With whom is Taro going to the movie at 5 o’clock?’  
 A1: Taro-wa [*Temp* 5-zi-ni] [*Com* MARY-TO] *eega-ni iku*  
 Taro-TOP 5-hour-TEMP Mary-COM movie-to go  
 yo.  
 PRT  
 ‘Taro is going to the movie with Mary at 5 o’clock.’  
 A2: Taro-wa [*Com* MARY-TO] [*Temp* 5-zi-ni] *eega-ni iku*  
 Taro-TOP Mary—COM 5-hour-TEMP movie-to go  
 yo.  
 PRT  
 ‘Taro is going to the movie with Mary at 5 o’clock.’

The data sets in (61) and (62) show that the Temp-Com order allows informational focus to be assigned to either of the PPs. In the reverse Com-Temp order, on the other hand, only the Com PP is allowed to carry informational

focus. The order of the two PPs and the available informational focus are schematized in (63).

- (63) a. Temp<sub>IF</sub> Com  
 b. Temp Com<sub>IF</sub>  
 c. Com<sub>IF</sub> Temp  
 d. ?Com Temp<sub>IF</sub>

Leaving aside the issue of why a derived order is more restricted than a base order when assigning informational focus, this test is still helpful in finding out whether a given order of two objects is a derived order or a base order in a ditransitive construction. Assuming the same test to be applicable to PPs, the patterns in (63) indicate that Temp-Com is the base order.

- (64) Temp > Com

This result in (64) conforms to the results of the focus-neutral order test. I have applied informational focus tests to different PP combinations. The results are found in the Appendix II. Similar to the focus-neutral tests, the results of the informational focus test suggest that the underlying order of PPs is fixed. More detailed discussion of the results is presented at the end of this chapter.

## 3.4 Diagnostic (III): Quantifier scope

### 3.4.1 Quantifier scope ambiguity between arguments

In this section, I adopt quantifier scope ambiguity as a diagnostic for finding derived structures of constituents. I apply this to PPs in order to find out underlying structure. First, I demonstrate that a derived order of two quantificational arguments yields scope ambiguity between the arguments. Then, I will examine scope ambiguity in different PP combinations.

It is argued that Japanese is a rigid scope language and that the scope of quantifiers is fixed when there is no movement involved (e.g., Kuno 1973, Hoji 1985). For example, in sentence (65), the quantificational subject ‘most people’ must have wide scope with respect to the quantificational object ‘at least two articles’ (65a). A narrow scope reading of the subject is not available (65b).<sup>13</sup>

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<sup>13</sup>In this thesis, I avoid the use of indefinite quantifiers, since an indefinite quantificational object like *dareka* ‘someone’ can take wide scope with respect to a quantificational subject *minna* ‘everyone’, as in (i).

- (i) Minna-ga dareka-o mita.  
 everyone-NOM someone-ACC saw.

- (65) [<sub>most</sub> Hotondo-no hito-ga] [<sub>2</sub> sukunakutomo futatsu-no ronbun-o]  
 most-GEN people-NOM at-least two-GEN article-ACC  
 yonda.  
 read  
 ‘Most people read at least two articles.’
- a. OK: Most<sub>x</sub> at least 2<sub>y</sub>, read(x, y) ‘For most people x. there are at least two articles y such that x read y.’
- b. NO: At least 2<sub>y</sub> most<sub>x</sub>, read(x, y) ‘There are at least two articles y such that most people x read y.’

It is also observed in the literature that when a quantificational element is moved across another quantificational element, the relative scope between the two is ambiguous (e.g., Kuroda 1970, Kuno 1973, Hoji 1985).<sup>14</sup> For instance, if the quantificational object ‘at least two articles’ in (65) is scrambled to the sentence initial position, creating the OSV order. Either the subject or the object can have wide scope with respect to each other, as illustrated in (66).

- (66) [<sub>2</sub> Sukunakutomo futatsu-no ronbun-o] [<sub>most</sub> hotondo-no hito-ga]  
 at.least two-GEN article-ACC most-GEN people-NOM  
 yonda.  
 read  
 ‘Most people read at least two articles.’
- a. OK: Most<sub>x</sub> at least 2<sub>y</sub>, read(x, y) ‘For most people x. there are at least two articles y such that x read y.’

---

‘Everyone saw someone.’ ( $\forall > \exists, \exists > \forall$ )

If one assumes that the SO order is a base order, and that Japanese is a rigid scope language, the wide scope of the object in (i) cannot be explained. Since the indefinite such as *dareka* obtains wide scope regardless of where it occurs in a sentence, it cannot be used to show whether the quantifier involves movement.

<sup>14</sup>In the literature, it is observed that long scrambling has a freezing effect on scope (e.g. Tada 1993). (Examples are taken from Nemoto 1999: 142)

- (i) a. Dareka-ga [John-ga daremo-o aishiteiru to] itta  
 someone-NOM John-NOM everyone-ACC love COMP said  
 ‘Someone said that John loves everyone.’ ( $*\forall > \exists, \exists > \forall$ )
- b. Daremo-o dareka-ga [John-ga t<sub>i</sub> aishiteiru to] itta  
 everyone-ACC someone-NOM John-NOM t love COMP said  
 ‘Everyone, someone said that John loves.’ ( $\forall > \exists, *\exists > \forall$ )

In (ia) in which both the matrix subject ‘someone’ and the embedded object ‘everyone’ are in the base-position, the matrix subject takes wide scope. In (ib) the embedded object is moved across the matrix subject by long scrambling, yielding the wide scope reading of the embedded object. The matrix subject c-commands the trace of the moved embedded object. Unlike the clause-internal scrambling example, however, the matrix subject in (ib) does not take scope over the embedded object.

- b. OK: At least  $2_y$  most $_x$ , read(x, y) ‘There are at least two articles y such that most people x read y.’

The contrast between the SOV order in (65) and the OSV order in (66) in terms of quantificational scope shows that a derived order, but not a base order, yields scope ambiguity between two quantificational arguments.

As an analysis of scope ambiguity, I adopt Saito (1985, 1989) and assume that scrambling in Japanese has radical reconstruction effects (for a brief summary of Saito’s arguments for reconstruction effects of scrambling, see the section on focus-neutral order). In the reconstruction analysis, a scrambled constituent can be moved back to its base-position at LF, without leaving a trace. According to this approach, the sentence without scrambling in (65) and the sentence with scrambling in (66) will be given the following analysis. Consider the sentence with the scrambled object in (66). In (66), scrambling of the object ‘at least two articles’ across the subject ‘most people’ would yield the surface/PF representation in (67a). When reconstruction of the scrambled object applies to the surface structure in (67a), the sentence in (66) would have an LF representation which is schematized in (67b). (67) and (68) illustrate only the relevant part of the structure in question.

- (67) a. [  $[DP$  at least two articles] $_i$  [  $[DP$  most people] ...  $t_i$  ... ] ]  
           (surface/PF representation)  
       b. [  $[DP$  most people] ... [  $[DP$  at least two articles] ... ] ]  
           (LF representation)

In the surface representation in (67a), the scrambled object ‘at least two articles’ c-commands the subject ‘most people’. In the LF representation in (67b), the subject c-commands the object which is reconstructed in its base-position. Assuming that the scope domain of a quantified element is its c-commanding domain May (1977), (67a) and (67b) successfully yield both wide and narrow scope reading of the object in relation to the subject.

On the other hand, the LF representation of the non-scrambled sentence in (65) would be identical to its surface representation, in which the subject c-commands the object, but not vice versa, as schematized in (68).

- (68) a. [  $[DP$  most people] ... [  $[DP$  at least two articles] ... ] ]  
           (surface/PF representation)  
       b. [  $[DP$  most people] ... [  $[DP$  at least two articles] ... ] ]  
           (LF representation)

The non-scrambled sentence in (65), therefore only contains the wide scope reading of the subject. Thus, in the reconstruction analysis, a word order with scope ambiguity is a derived order by scrambling at surface structure. In this sense, the scope ambiguity can be used to detect the base order of two arguments in Japanese. In the following subsection, I apply the scope

ambiguity test to PPs.

### 3.4.2 Application of the test to PPs

The quantifier scope test can also be used to detect the base order between two modifier PPs in Japanese. Similar to a quantificational argument, a modifier PP that takes a quantificational NP as a complement shows scope ambiguity with respect to another modifier PP with a quantificational element, depending on the relative word order between the two PPs. For example, in the combination of a Temporal PP (Temp) and a Comitative PP (Com), only the Com-Temp order yields ambiguity of the relative scope between the quantificational elements. To avoid an indefinite and/or a collective reading, I use *sukunakutomo futatsu* ‘at least two’ and *hotondo-no* ‘most’ as quantifiers. Furthermore, to make sure that the test leads to consistent results, each PP is modified by both ‘at least two’ and ‘almost’. The patterns of quantifier modification which I examine in the combination of Temp and Com are schematized in (69).

- (69) a. Temp PP<sub>at.least.2</sub> Com PP<sub>most</sub>  
 b. Com PP<sub>most</sub> Temp PP<sub>at.least.2</sub>  
 c. Temp PP<sub>most</sub> Com PP<sub>at.least.2</sub>  
 d. Com PP<sub>at.least.2</sub> Temp PP<sub>most</sub>

Let us examine the first two patterns in (69a) and (69b), i.e., a Temp PP takes an NP with ‘at least two’ as a quantificational modifier, and a Com PP takes an NP with ‘most’. Examples which correspond to these patterns are illustrated in (70).

- (70) a. Yamada sensei-wa [<sub>Temp</sub> sukunakutomo 2tu-no saizitsu-ni]  
 Yamada teacher-TOP at.least 2cl-GEN holiday-Temp  
 [<sub>Com</sub> hotondo-no gakusee-to] zyogingu-shita.  
 most-GEN student—COM jogging-did  
 ‘The teacher Yamada jogs with most of the students on at least two holidays.’  
 b. Yamada sensei-wa [<sub>Com</sub> hotondo-no gakusee-to] [<sub>Temp</sub> sukunakutomo  
 Yamada teacher-TOP most-GEN student-COM at.least  
 2tu-no saizitsu-ni] zyogingu-shita.  
 2cl-GEN holiday-Temp jogging-did  
 ‘The teacher Yamada jogs on at least two holidays with most of the students.’

The sentences in (70) have two logically possible readings; both wide and narrow scope of ‘at least two’ with respect to ‘most’. In order to make it easier for informants to judge the available readings of each sentence, I created



three different scenarios, according to which each logical reading is possible. To make possible readings concrete, I listed five holidays and five names of people as context for the Temp PP and Com PP, respectively in (71).

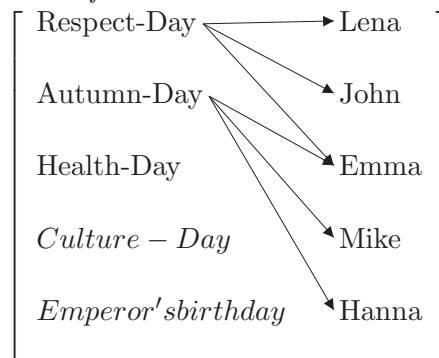
- (71) Holidays: respect-for-the-aged day, autumnal equinox day, health-sports day, culture day, and the emperor's birthday.  
Names: Lena, John, Emma, Mike, and Hanna.

Adopting the holidays and names listed in (71) as context, the scenarios in which each reading is possible are illustrated in (73). Arrows in (73) represent the possible scope of the Temp-Com order, while the arrows in (75) represent the possible scope of the Com-Temp order. Consider first the Temp<sub>at.least.2</sub>-Com<sub>most</sub> order, which is repeated in (72).

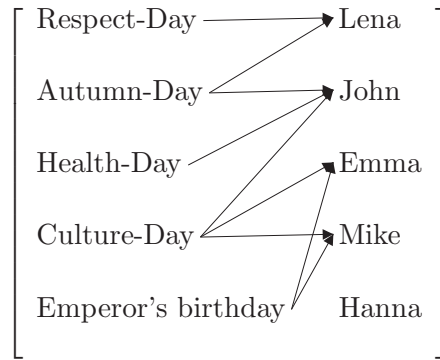
- (72) Yamada sensei-wa [<sub>Temp</sub> sukunakutomo 2tu-no saizitsu-ni] [<sub>Com</sub>  
Yamada teacher-TOP at.least 2cl-GEN holiday-Temp  
hotondo-no gakusee-to] zyogingu-shita.  
most-GEN student-COM jogging-did  
'The teacher Yamada jogs with most of the students on at least two holidays.'

As the array in (73) shows, in the Temp<sub>at.least.2</sub>-Com<sub>most</sub> order, only the wide scope reading of the Temp PP is allowed.

- (73) a. **OK (at least 2 holidays > most students)**  
'There are at least two holidays such that Yamada jogged with most of the students.'



- b. **\*(2 holidays < most students)**  
'Most students are such that Yamada jogged with them at least on two holidays.'

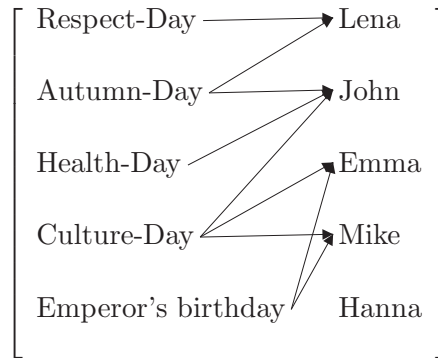


Consider now the reverse order,  $Com_{most}$ - $Temp_{at.least.2}$ . The relevant sentence is repeated in (74).

- (74) Yamada sensei-wa [ $Com$  hotondo-no gakusee-to] [ $Temp$  sukunakutomo  
 Yamada teacher-TOP most-GEN student—COM at.least  
 2tu-no saizitsu-ni] zyogingu-shita.  
 2.cl-GEN holiday-TEMP jogging-did  
 ‘The teacher Yamada jogs on at least two holidays with most of the students.’

In the reverse order, both the wide and narrow scope reading of the Temp PP is available, as illustrated in (75).

- (75) a. OK (**2 holidays** > **most students**)
- 
- Diagram illustrating the relationship between five Japanese holidays and five students (Wide Scope Reading):
- Respect-Day points to Lena.
  - Autumn-Day points to John, Emma, and Mike.
  - Health-Day points to John, Emma, and Mike.
  - Culture - Day* points to John, Emma, and Mike.
  - Emperor's sbirthday* points to John, Emma, and Mike.
- b. OK (**2 holidays** < **most students**)



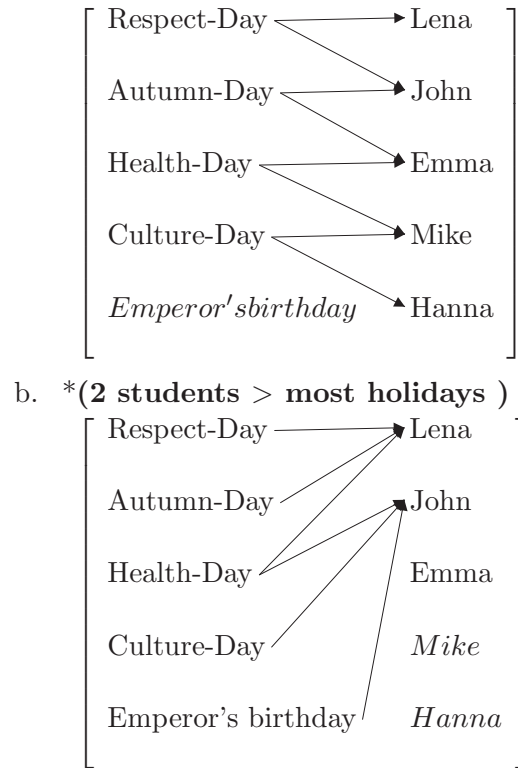
The two sets of array show that in the  $\text{Temp}_{at.least.2}\text{-Com}_{most}$  combination, the Com-Temp order, but not the Temp-Com order, yields scope ambiguity. Under the reconstruction approach to scope ambiguity, the Com-Temp order which yields scope ambiguity is analyzed as a derived order by scrambling. The Temp-Com order, on the other hand, is argued to be the base order under this approach. I thus assume that Temp is structurally higher than Com.

To make sure that the type of quantifier does not interfere with the scope ambiguity, let us now check the other logically possible combination of  $\text{Temp}_{most}\text{-Com}_{at.least.2}$ . The sentences that represent this combination of quantifiers are given in (76).

- (76) a. Yamada sensei-wa [ $\text{Temp}$  2gakki-no hotondo-no saizitsu-ni]  
 Yamada teacher-TOP 2.semester-GEN most-GEN holiday-Temp  
 [ $\text{Com}$  sukunakutomo 2 ri-no gakusee-to] zyogingu-shita.  
 at.least 2 CL-GEN student—COM jogging-did  
 ‘The teacher Yamada jogs with at least two students in most of  
 the holidays of the second semester.’
- b. Yamada sensei-wa [ $\text{Com}$  sukunakutomo 2 ri-no gakusee-to]  
 Yamada teacher-TOP at.least 2 CL-GEN student-COM  
 [ $\text{Temp}$  2gakki-no hotondo-no saizitsu-ni] zyogingu-shita.  
 2.semester-GEN most-GEN holiday-Temp jogging-did  
 ‘The teacher Yamada jogs with at least two students in most  
 of the holidays of the second semester.’

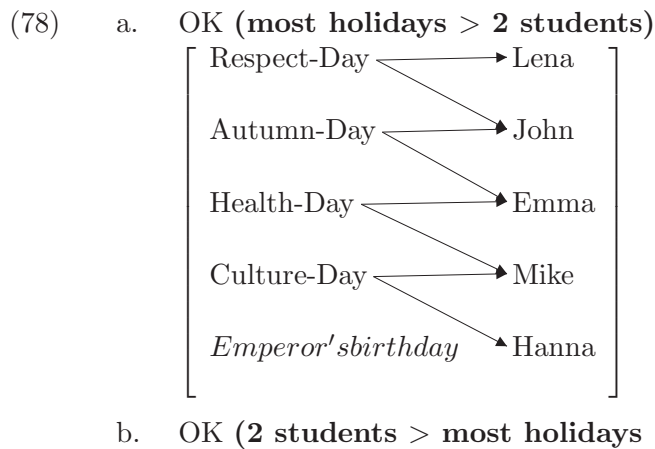
Let us first consider the  $\text{Temp}_{most}\text{-Com}_{at.least.2}$  order represented by the sentence in (76a).

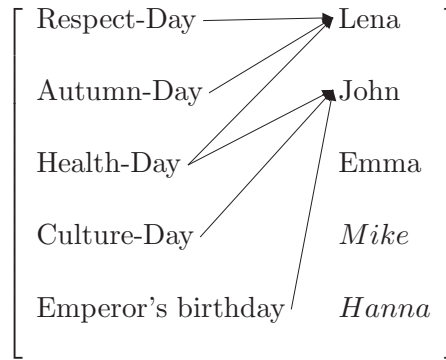
- (77) a. OK (most holidays > 2 students)



As the arrows in (77a) show, the sentence in (76a) is well-formed in the scenario that allows a wide scope reading of the Temp PP. The sentence is judged to be ill-formed in the scenario in (77b), which allows a narrow scope reading of the Temp PP with respect to the Com PP.

On the other hand, in the reversed Com-Temp order in (76b), either wide or narrow scope reading of the Temp PP is allowed, as illustrated in (78).





The  $\text{Temp}_{most}$  -  $\text{Com}_{at.least.2}$  combination shows that the Com-Temp order, and not the Temp-Com order, yields scope ambiguity. Thus, both quantificational patterns,  $\text{Temp}_{at.least.2}$ - $\text{Com}_{most}$  and  $\text{Temp}_{most}$ - $\text{Com}_{at.least.2}$ , lead us to the conclusion that a Temporal PP is structurally higher than a Comitative PP. The results of this test are consistent with the results of the other two tests, the focus-neutral order test and the informational focus test. All three tests indicate that Temp-Com is the base order as in (79).

(79) Temp > Com

I have applied the Quantifier Scope test to all the possible combinations of modifier PPs in Japanese. For reasons of space and formatting, I simply add the data sets to the Appendix II.

## 3.5 Results of the tests

### 3.5.1 Results of the focus-neutral order test

The results of the focus-neutral order test are summarized in Table (81), which is found at the end of this subsection (see the selected examples in Appendix I for the data).<sup>15</sup> Table (81) should be read as follows: PP1s run along the vertical axis, while PPs run along the horizontal axis. The entry *1* represents that PP1 must precede PP2 in a focus-neutral order. For example, the Temp row which is the topmost row of the table has *1* as an entry throughout the row. This means that the Temp PP must precede all other types of PPs in a focus-neutral word order. The entry *-1*, on the other hand, signals that PP1 must be preceded by PP2. Consider the Loc row, as an example. The Loc row has the entry *-1* in relation to the Temp column, indicating that a Loc PP must be preceded by a Temp PP. In relation to the rest of the PPs (ignoring a Reason PP for the sake of simplicity for the moment), a Loc PP has *1* as an entry, indicating that the Loc PP precedes all PPs except for the Temp PP. Finally, throughout the tables in the result subsections, the use of *NC* means that PP1 and PP2 are not compatible and the use of *0* signals that no contrast is observed between PP 1 and PP 2.

Assuming that a focus-neutral order is the base order, the results of the focus-neutral word order test indicate that postpositions in Japanese have a rigid base order. The hierarchy extracted from the results is schematized in (80). The topmost entry is the highest in the structure.

(80) The hierarchy extracted from the focus-neutral order test

Temp
Reason
Loc
Com
Reason
Sour <sub>Place</sub>
Goal
Instrumentalal/Means
Material
Manner

The postposition hierarchy in Japanese shown in (80) coincides with Schweikert's (2005) preposition hierarchy in German, except for the position of Reason PP. According to Schweikert (2005), Reason PP in German appears in a po-

<sup>15</sup>For reasons of formatting, the tables which summarize the results of the tests are found at the end of each subsection.

sition which is higher than Source PP but lower than Com PP. On the other hand, Reason PP in Japanese seems to appear in two positions. As in German, it occurs in a position between Source and Com but it also appears between Temp and Loc. As the following subsection will illustrate, the results from the informational focus test also indicate that Reason PP appears in two positions in Japanese. One way to account for the two positions is to assume that there are two types of Reason, a high Reason and a low Reason. Leaving aside the positions of Reason for the moment, the results of focus neutral order test gives support to Schweikert's (2005) preposition hierarchy.





### 3.5.2 Results of the informational focus test

Table (85), which is at the end of this subsection, summarizes the results of the informational focus test.<sup>16</sup> Let me first explain the use of terms in the table. An arbitrary letter *R* represents that the PP1-PP2 order is fine regardless of which PP carries focus, but the reverse PP2-PP1 order is not allowed regardless of which PP information focus is assigned to. The patterns of PPs represented by *R* is schematized in (82).

- (82) The pattern *R*
- a. PP1<sub>IF</sub>-PP2
  - b. PP1—PP2<sub>IF</sub>
  - c. \*PP2<sub>IF</sub>-PP1
  - d. ??PP2—PP1<sub>IF</sub>

A letter *S* in table (85) signals that the behavior of PP 1 and PP 2 with respect to information focus assignment is similar to the behavior of two objects in a ditransitive construction. More precisely, *S* represents the patterns schematized in (83).

- (83) The pattern *S*
- a. PP1<sub>IF</sub>-PP2
  - b. PP1—PP2<sub>IF</sub>
  - c. PP2<sub>IF</sub>-PP1
  - d. ?PP2—PP1<sub>IF</sub>

In (83), the PP1-PP2 order allows a flexible informational focus assignment in which either of the PPs can bear focus. In the PP2-PP1 order, on the other hand, PP 2 is preferred to carry information focus.

Consider the Temp row as an example. The Temp row has the entry *S* in relation to a Loc PP (and all the other PPs). This means that the Temp-Loc order allows either of the PPs to carry focus, while in the Loc-Temp order, the Loc PP is preferred to carry focus.

In the double object construction, only the base order, and not the derived order, allows flexible informational focus assignment to either to the IO or the DO. If I interpret the word order with flexible informational focus assignment to be the base order, the Temp-Loc order which allows the flexible informational focus assignment is assumed to be the base order.

According to table (85), most PP combinations show the pattern *S*. Taking the *S* pattern as an indication for the hierarchical position of postpositions, the results of the informational focus test lead to the hierarchy in (84).

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<sup>16</sup>In table (85), shaded cells signal that the results are redundant with regard to the corresponding results on the right half of the table.

(84) The hierarchy extracted from the information focus test

Temp
Loc/Reason
Com
Reason
Sour <sub>Place</sub>
Goal
Inst/Means
Material
Manner

The overall hierarchy in (84) seems to conform to Schweikert's (2005) hierarchy of German prepositions, except that Reason appears in two positions. It may appear between Com and Source or between Com and Temp. This distributional property of Reason in Japanese is consistent with the findings from the focus-neutral order test. In both resulting hierarchies, Reason appears in two positions, one between Com and Source, and the other between Com and Temp.

(85)

PP \ PP	Temp	Loc	Com	Rea	Sour	Goal	I/M	Mat	Man
Temp		S	S	S	S	S	S	S	S
Loc			S	0	R	S	S	S	S
Com				S	S	S	S	S	S
Rea					S	S	R	R	R
Sour						S	S	NC	S
Goal							S	NC	NC
I/M								S	S
Mat									S
Man									

### 3.5.3 Results of the quantifier scope test

The results of the quantifier scope test are summarized in Table (91). Table (91) should be read as follows: PP1 in the row and PP2 in the column constitute a given PP1-PP2 order. The table (91) contains entries, *S* and *B*, each of which signals a different scope relation, illustrated in (86).

- (86) a. *S*: the ordered PP combination yields the surface scope.  
 b. *B*: the ordered PP combination yields the reverse scope.

In quantifier scope section, I examine a combination of two PPs, each with a different quantificational element. Consider the Temp-Com order as an example. There are two patterns of the Temp-Com order with respect to which quantifier each PP combines with, as schematized in (87).

- (87) a. Temp<sub>at.least.2</sub> - Com<sub>most</sub> (The first entry)  
 b. Temp<sub>most</sub> - Com<sub>at.least.2</sub> (The second entry)

For the sake of convention, I have determined the pattern in (87a) to be the first entry and the pattern in (87b) to be the second entry of the result. Given this convention, the result of the Temp-Com order, which contains ‘S/S’ as an entry, should be read as below. The first *S* entry states that the Temp<sub>at.least.2</sub>-Com<sub>most</sub> order yields unambiguously wide scope of the Temp PP in relation to the Com PP. The second *S* entry states that the Temp<sub>most</sub>-Com<sub>at.least.2</sub> order also yields unambiguously wide scope of the Temp PP. Thus the result indicates that the Temp-Com order only gives rise to wide scope or Temp with respect to Com, regardless of the type of quantifiers.

With respect to the Com-Temp order, this order also contains two patterns, depending on which type of quantifiers, each PP combines with, as schematized in (88).

- (88) a. Com<sub>most</sub> - Temp<sub>at.least.2</sub> (The first entry)  
 b. Com<sub>at.least.2</sub> - Temp<sub>most</sub> (The second entry)

In the Table (91), the Com-Temp order gives rise to the result of ‘SB/SB’.<sup>17</sup> Taking the patterns in (88) into consideration, ‘SB/SB’ should be interpreted in the following manner. In the Com<sub>most</sub>-Temp<sub>at.least.2</sub> order, the first entry states that the Temp PP takes either wide scope or narrow scope in relation to the Com PP. The second entry states that the Com<sub>at.least.2</sub>-Temp<sub>most</sub> order receives the same pattern ‘SB’, meaning that either scope of the Temp PP is obtained in this pattern. Thus the results indicate that the Com-Temp order yields scope ambiguity regardless of the type of quantifiers each PP combines

<sup>17</sup>In the left half of table (91), some entries are placed in curly brackets. This means that judgement of informants split in two. ? and ??, on the other hand, mean that the PP order in a given quantifier pattern is judged to be degraded in grammaticality.

with.

Assuming that scope of a quantificational element is reflected in structure, wide scope of the Temp PP in relation to the Com PP in the Temp-Com order indicates that the Temp PP is structurally higher than the Com PP. On the other hand, given a reconstruction analysis of Saito (1992), the scope ambiguity of the Com PP in relation to the Temp PP in the Com-Temp order indicates that the Com-Temp order is a derived order. In the derived order (i.e., Com-Temp), Com is structurally higher than Temp, yielding wide scope of Com. When reconstruction takes place, Com is in the base position which is lower than Temp, giving rise to narrow scope of Com. The results of the quantifier scope test support the argument that the Com-Temp order is a derived order and that Temp is underlyingly higher than Com. This is consistent with the results of the other two tests.

(89) Temp > Com

According to the results of the quantifier scope test, the following hierarchy is extracted.

(90) The hierarchy extracted from the quantifier scope test

Temp
Loc
Com
Source
Reason
Goal
Inst/Means
Material
Manner

The postpositional hierarchy in (90) is consistent with the one that is deduced from the results of the other tests, except for the relative position of Reason PP. In the hierarchy obtained from the focus-neutral order test and the informational focus test, Reason PP appears in two positions- between Temporal and Com and between Com and Source. In the hierarchy in (90), however, Reason PP appears in a lower position, between Source and Goal. The variation in terms of the distributional property of Reason PP may suggest that there are subtypes of Reason which are generated in different structural positions.

(91)

PP1 \ PP2	Temp	Loc	Com	Rea	Sour	Goal	I/M	Mat	Man
Temp		S/S	S/S	S/S	S/S	S/S	S/S	S/S	S
Loc	S/SB		S/S	S	S	S	S/S	S/S	S/S
Com	SB/SB	SB/SB		S/S(B)	S/S	S/S	S/S	S/S	S
Rea	B/SB	SB	(S)B/SB		B/SB	S/S	S	S	S
Sour	SB/SB	SB	S/S	S/S		S	S/S	NC	S/S
Goal	(S)B/S	SB	SB/SB	SB/S	SB		S/S	NC	S/S(B)
I/M	(S)(B)/(S)B	B/SB	?/SB	SB	SB/SB	SB/S		S	S
Mat	??/SB	??/SB	SB/SB	SB	NC	NC	SB		S
Man	SB	??/S(B)	SB	SB	SB/SB	SB/SB	SB	SB	

### 3.6 Summary

In this chapter, on the basis of three diagnostics, I argued that modifier PPs in Japanese are base-generated in a rigid order. The three diagnostics I adopted are: a focus-neutral order test, an informational focus test, and a quantifier test. In order to see a total word order, each test was applied to all possible combinations of the different PP types. The results of each test indicate that the underlying order of modifier PPs in Japanese is rigid. Hierarchies that are extracted from the results of each test are given in (92). In table (92), *FNO*, *IF*, and *QS* stand for the focus-neutral order test, the informational focus test, and the quantifier scope test, respectively.

(92) Hierarchies extracted from the three tests

<b>FNO</b>	<b>IF</b>	<b>QS</b>
Temp	Temp	Temp
Reason		
Loc	Loc/Reason	Loc
Com	Com	Com
Reason	Reason	
Source	Source	Source
		Reason
Goal	Goal	Goal
Inst/Means	Inst/Means	Inst/Means
Material	Material	Material
Manner	Manner	Manner

The three resulting hierarchies schematized in (92) correspond to each other, except for the positions of Reason. In all three hierarchies, Temp and Loc are in the highest positions, whereas Material and Manner are in the lowest positions in the hierarchy. The rest of the PPs, Source, Goal and Inst/Means, appear in the intermediate positions between Temp/Loc and Material/Manner.

The results of the tests with regard to the position of Reason, however, are not very consistent. On the one hand, results from two tests indicate that Reason appears in a position between Com and Source, which conforms to the position of Reason in Schweikert's (2005) PP hierarchy for German. On the other hand, the same tests also indicate that Reason can appear in a position higher than Com. Furthermore, the results of the quantifier scope test imply that Reason can appear in a position between Source and Goal.

A possible explanation for the behavior of Reason may be that Reason is not a homogeneous class but can be divided into subtypes. If this is the case, morphemes *de* and *kara* may manifest Reasons of different types, each of which appears in a unique position in the hierarchy. At the moment, I

have no concrete solutions to the multiple positions of Reason in Japanese. For the sake of simplicity, however, I assume the position between Com and Source, which is implied by the majority of the tests, as a base-position of Reason for the moment. This is a plausible position for Reason, given that in German, Reason PP appears in between Com and Source. Assuming this, the hierarchy extracted from the results of the three tests discussed in this chapter is schematized in (93).

- (93) Temp > Loc > Com > Reason > Source > Goal > Inst/Means >  
Material > Manner

The resulting hierarchy of PPs in Japanese corresponds to the PP hierarchy in German proposed by Schweikert (2005). The findings of the investigation in this chapter, therefore, present supporting evidence for his approach.

In the next chapter, I will investigate where the proposed postposition hierarchy in (93) is located in a clause structure. On the basis of compositionality scope tests, I will argue that modifier PPs in the hierarchy in (93) may appear between a VP and a Modal head. To be more specific, I will argue that the two highest PPs, Temp and Loc, may appear in the Modal domain, whereas the two lowest PPs, Material and Manner, must be below the low Aspect head.



## Chapter 4

# Mapping of PPs onto the Modal/Aspect field

It can be easily observed that there is some scope interaction between a PP and an aspectual verb. Consider the example in (1).

- (1) Taro-ga [<sub>Loc</sub> shinshitsu-de] hon-o yomi-*tsuzuke* ta.  
Taro-NOM bedroom-LOC book-ACC read-continue PAST  
'Taro continued reading a book in the bedroom.'

The sentence in (1) is fine under a scenario where Taro was reading a book in the kitchen first and kept on reading the book in the bedroom later. In this scenario, a Loc PP 'in the bedroom' is outside the scope of the continuation of the reading event. Assuming that scope is represented in structure, the fact that the sentence in (1) is fine under this scenario indicates that Loc can be higher than the aspectual verb 'continue'.

On the basis of scope facts, this chapter investigates the position of individual PPs in the PP hierarchy proposed in the previous chapter, with respect to aspect and modal markers. In section 1, I compare two major analyses of aspectual verbs like *das* 'start', *oe* 'complete' and *tsuzuke* 'continue' in Japanese. A bi-clausal approach by Kageyama (1993; 1999), among others, and a single projection analysis by Fukuda (2007) are discussed. Based on adverb distribution, I will argue for a single projection analysis for these aspectual verbs. In section 2, I examine the scope interaction between each PP type and the three aforementioned aspectual verbs. The results indicate that the highest PP, Temp, cannot occur below the Aspect head manifested by *oe* 'complete' and that the two lowest PPs, Material and Manner, cannot be above the same Aspect head. Section 3 examines the scope interaction between the PPs and the result state or progressive aspect marker *tei*, which is argued to be higher than the three aspectual verbs. The scope tests indicate that the two highest PPs, Temp and Loc, can be above this Aspect head, while lower PPs like

Com and Inst/Means cannot. Given these results, a prediction that arises is that Com and Inst/Means should not appear in the modal domain which is assumed to be higher than the aspect domain (cf. Narrog 2009). Using the scope data, section 4 demonstrates that this prediction is borne out. This section also argues against Narrog's (2009) claim that the aspect marker *tei* can appear freely in five different positions. I argue that *tei* is ambiguous between an experiential aspect and a current situation aspect, each of which appears in its own position above and below the abilitative modal *rare*, marking a boundary between the modal domain and the aspect domain. Section 5 investigates the position of the PPs with respect to the modal hierarchy which is extracted from Narrog's (2009) study. The results of scope tests indicate that the two highest PPs, Temp and Loc, may appear in the position below the deontic modal marker in the modal domain.

## 4.1 Aspectual verbs

Modifier PPs interact structurally with aspectual verbs like 'continue', 'start' and 'complete' in Japanese. This interaction provides a clue in determining the structural position of the PPs. The aspectual verbs named above are typical examples of so-called restructuring verbs, whose syntactic status is extensively discussed in the literature.<sup>1</sup> The two major approaches to aspectual verbs in Japanese are a bi-clausal approach (Kuno 1983, Kageyama 1993; 1999, among others) and a mono-clausal approach (Fukuda 2006, 2007). This section provides a brief summary of each approach, followed by an argument for the mono-clausal approach.

### 4.1.1 Bi-clausal approaches

#### Control/Raising analysis (Shibatani 1978, Kuno 1983, Nishigauchi 1993)

It has been argued in the literature that some aspectual verbs have a control infinitive as a complement, while others have a raising infinitive. Shibatani (1978), Kuno (1983), and Nishigauchi (1993), among others, claim that aspectual verbs are divided into three classes, depending on the type of complement clause they select. The first class, which contains verbs like *das* 'start', allows

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<sup>1</sup>In the literature, the two major approaches to the structure of restructuring verbs are mono-clausal approaches and bi-clausal approaches. According to mono-clausal approaches, a sentence with a restructuring verb is a single clause throughout the derivation (e.g., Wurmbrand 1998, among others). According to bi-clausal approaches, a restructuring verb, which forms an independent clause in the base structure, undergoes a clause union process (or a structure changing operation) and ceases to function as a distinct clause.

raising constructions but not control constructions. The second class, which involves verbs like *oe* ‘complete’, allows control constructions but not raising constructions. The third class, which contains *hazime* ‘begin’, *tsuzuke* ‘continue’, etc, allows both both control and raising constructions.

- (2) Control/Raising typology (Shibatani 1978, Kuno 1983, Nishigauchi 1993)
- a. Raising verbs: *das* ‘start’, etc.
  - b. Control verbs: *oe* ‘complete’, *wasure* ‘forget’, etc.
  - c. Ambiguous between the two: *tsuzuke* ‘continue’, *hazime* ‘start’, etc.

In the studies above, a crucial difference between a control and raising structure is that a control structure takes a matrix external argument, whereas a raising structure does not. According to Kuno (1983), the verb *hazime*, which is ambiguous between the two structures, may be assigned either a control structure (3a) or a raising structure (3b) (Kuno 1983: 8). In an updated theory, the second instance of *Tanaka* in (3a) would be a PRO.

- (3) Tanaka-ga tegami-o kaki-hazime-ru.  
 Tanaka-NOM letter-ACC write-start-PAST  
 ‘Tanaka started to write a letter.’
- a. [<sub>S</sub> Tanaka-ga [<sub>S</sub> Tanaka-ga tegami-o kaki]-hazime-ru.]  
 Tanaka-NOM Tanaka-NOM letter-ACC write-start-PRES  
 ‘Tanaka started to write a letter.’
  - b. [<sub>S</sub> [<sub>S</sub> Tanaka-ga tegami-o kaki]-hazime-ru.]  
 Tanaka-NOM letter-ACC write-start-PRES  
 ‘Tanaka started to write a letter.’

Shibatani (1978), among others, supports the three-way classification on the basis of the behavior of those aspectual verbs with respect to some syntactic phenomena. Aspectual verbs like *hazime* ‘start’, *tsuzuke* ‘continue’, *owar* ‘complete’, and *oe* ‘complete’ are observed to show different behaviors with respect to (i) selectional restriction, (ii) honorification and (iii) passivization (Kuno 1973, Nishigauchi 1993, Kageyama 1993; 1999, Koizumi 1995; 1998, Matsumoto 1996).

Based on the selectional restriction facts originally observed by Shibatani (1978) and Kuno (1983), Nishigauchi (1993) argues that the verb *oe* typically requires an Agent as its subject, which can be the controller of the embedded subject. On the other hand, *das* and the ambiguous verbs *tsuzuke* and *hazime* are not subject to this restriction.

- (4) a. \*Ame-ga furi-oe-ta.  
rain-NOM fall-complete-PAST  
'Rain completed to fall.'
- b. Ame-ga furi-hazime/tsuzuke/owar/dashi-ta.  
rain-NOM fall-start/continue/complete/start-PAST  
'Rain started/continued/completed/started to fall.'

Given that pure control verbs typically require an Agent subject or a theta-marked subject, and whereas there is no such requirement for raising verbs, Nishigauchi argues that the contrast in grammaticality between (4a) and (4b) is due to 'rain' not being an Agent that initiates the action depicted by the verb. It therefore does not qualify as a Controller subject.

Shibatani presents an additional example that illustrates the same point. A presumed control verb *oe* 'complete' requires an animate subject and it is incompatible with an inanimate subject (Shibatani 1973: 69).

- (5) Buranko-ga yure hazime/tsuzuke/owar/\*oe-ta.  
swing-NOM swing start/continue/complete/complete  
'The swing started/continued/completed/completed swinging.'

Further support for the raising/control distinction comes from subject honorification (henceforth SH). Before presenting the detailed data, an example of SH is introduced in (6). SH is expressed by the form *o-V-ni naru*, in which a prefix *o* and a suffix *ni* followed by the verb *nar* 'become' frame the verb root. As the ungrammaticality of (6b) shows, the honorific complex verb is associated with the subject and not with the object (Harada 1976, Shibatani 1978).

- (6) a. Tanaka sensei-ga seeto-o o-home-ni natta.  
Tanaka professor-NOM pupil-ACC hon-praise-ni become.PAST  
'Professor Tanaka praised his pupil.'
- b. \*Seeto-ga Tanaka sensei-o o-home-ni natta.  
pupil-NOM Tanaka professor-ACC hon-praise-ni become.PAST  
'The pupil praised Professor Tanaka.'

SH takes place only when the subject is a person socially superior to the speaker (Harada 1976). In (6a) 'teacher' is the subject and so the verb is realized with the honorific morphemes. In contrast, (6b), with 'pupil' as the subject, does not allow the appearance of the honorific complex verb; 'pupil' is not sufficiently respected.

SH allows two word order patterns *o-V-V-ni naru* (matrix SH hereafter) and *o-V-ni nar-V* (embedded SH hereafter), depending on whether the honorific suffix attaches to the matrix verb or the embedded verb. A pure control verb like *oe* allows matrix SH but not embedded SH, while a pure raising verb like *das* allows embedded SH but not matrix SH. An ambiguous verb such as

*hazime*, on the other hand, allows both types of SH. Examples of matrix SH and embedded SH are given in (7) and (8).

- (7) Matrix SH
- a. Sensei-ga tegami-o o-kaki hazime-ni nar ta.  
 professor-NOM letter-ACC o-write start-ni become PAST  
 ‘The professor started to write a letter.’
  - b. \*Sensei-ga tegami-o o-kaki dashi-ni nar ta.  
 professor-NOM letter-ACC o-write start-ni become PAST  
 ‘The professor started to write a letter.’
  - c. Sensei-ga tegami-o o-kaki oe-ni nar-ta.  
 professor-NOM letter-ACC o-write complete-ni become-PAST  
 ‘The professor completed writing a letter.’
- (8) Embedded SH
- a. Sensei-ga tegami-o o-kaki-ni nari hazime-ta.  
 professor-NOM letter-ACC o-write become start-PAST  
 ‘The professor started/continued to write a letter.’
  - b. Sensei-ga tegami-o o-kaki-ni nari dashi ta.  
 professor-NOM letter-ACC o-write become start PAST  
 ‘The professor started to write a letter.’
  - c. \*Sensei-ga tegami-o o-kaki-ni nari oe-ta.  
 professor-NOM letter-ACC o-write become complete-PAST  
 ‘The professor completed writing a letter.’

Given that SH requires the presence of a subject, the control/raising analysis may partially accounts for the contrast between (8) and (7). According to the analysis, the verb *oe* is a control verb and hence contains an external argument. *Oe*, therefore, allows for matrix SH. The raising verb *das*, on the other hand, lacks an external argument, and hence disallows matrix SH. Since *das* contains an embedded external argument, embedded SH is possible. The control/raising analysis, however, does not seem to provide a straightforward account for the non-availability of embedded SH with the control verb *oe*. Under the PRO analysis of control, the verb *oe* contains PRO as an embedded subject, which may satisfy the agreement requirement. In order to exclude embedded SH, the control/raising analysis needs an additional assumption: that agreement does not hold between PRO and SH morphemes, for example.

Lastly, passivization classifies these aspectual verbs in the same way as the SH data does. A pure control verb *oe* ‘complete’ allows long passive, passivization of an embedded object with the passive morpheme following the matrix aspectual verb. On the other hand, it disallows a standard short passive. Ambiguous verbs like *hazime* allow both types of passive (Shibatani 1978, Nishigauchi 1993).

- (9) Long passive

- a. Sono ronbun-ga yomi hazime/tsuzuke rare-ta.  
that article-NOM read start/continue PASS-PAST  
'People began/continued to read that article. (People started reading the same article at the same time. A single event reading.)'
- b. Ronbun-ga yomi *oe* rare-ta.  
article-NOM read complete PASS-PAST  
'The paper ceased to be read.'
- c. \*John-ga (Mary-ni) nikumi-das-are-ta.  
John-NOM (Mary-by) hate-begin-PASS-PAST  
'(\*John was started to hate (by Mary).)' (Nishigauchi 1993: 94)
- (10) Short passive
- a. Sono ronbun-ga yom are hazime/tsuzuke-ta.  
that article-NOM read PASS start/continue-PAST  
'(That article has started to attract people's attention, and) People started/continued to read the article. (Not single event reading)'
- b. \*Ronbun-ga yom are *oe*-ta.  
article-NOM read PASS complete-PAST  
'The paper ceased to be read.'
- c. John-ga (Mary-ni) nikumi-are-dashi-ta.  
John-NOM (Mary-by) hate-PASS-begin-PAST  
'John started to be hated (by Mary).'  
(Nishigauchi 1993: 94)

Given the "external argument suppression" analysis of passive (Chomsky 1981), the control/raising analysis provides an explanation for the contrast among *oe*, *hazime* and *das* in terms of long/short passive formation. Nishigauchi (1993) assumes that, like the English passive morpheme *-en*, the Japanese passive morpheme *rare* absorbs the case structurally assigned by the V to which it attaches. He also assumes that it absorbs the theta role of the subject of its complement clause VP. Given these assumptions, a pure raising verb like *das*, which lacks an external argument, does not meet the prerequisite for a passive construction. Since *das* lacks an external argument, there is no theta role for *rare* to absorb. Long passive of *das* is therefore excluded for theta-theoretic reasons under the control/raising analysis. *Das* allows short passive, however, since it selects a VP with an external argument which can be dethematized by *rare*.

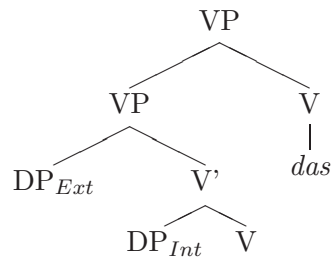
Contrastively, the pure control verb *oe* meets the prerequisite for a passive construction, since it contains a matrix external argument whose theta role can be absorbed by *rare*. *Oe*, therefore, allows matrix passivization. *Hazime* and *tsuzuke* are ambiguous between control and raising verbs, and hence allow both short passive (when they are raising verbs) and long passive (when they are control verbs).

The explanation provided by the control/raising analysis, however, is not satisfactory, since it is not clear how the analysis accounts for why a control verb *oe*, which contains a theta role assigned PRO as an embedded subject, disallows short passive.<sup>2</sup> Furthermore, it does not explain why long passive is grammatical with aspectual control verbs like *oe* ‘complete’. Given the PRO analysis of control in this approach, movement of an embedded object to the matrix subject position across the embedded PRO subject would be a minimality violation (Rizzi 1990) and hence incorrectly predicted to be ungrammatical. In order to solve this problem, Kageyama (1993, 1999) proposes the reduced/full complement approach for aspectual verbs.

### Reduced/full complement analysis (Kageyama 1993, 1999)

Kageyama proposes that aspectual verbs select either a full VP complement or a reduced V’ complement: ‘control verbs’ select a reduced V’ complement, whereas ‘raising verbs’ select a full VP complement.<sup>3</sup>

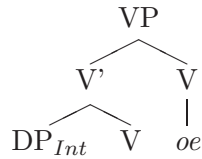
(11) ‘Raising’ structure



<sup>2</sup>Nishigauchi (1993: 93) suggests that the example of short passivization of a control verb like *oe* as in (10b) can be excluded for theta-theoretic reasons. Assuming that a control verb requires an Agent argument, (10b), which has a non-Agent subject, does not meet this requirement. Alternatively, assuming that a control verb like *oe* requires a telic complement, short passivization, which “intransitivizes” the embedded verb, would violate this requirement.

<sup>3</sup>A similar approach is found in Wurmbrand 2001. Wurmbrand (2001) hypothesizes that the lexical restructuring verbs lack the embedded structural Case position vP, and that these verbs take a bare VP infinitive as a complement. Her proposal is similar to Kageyama’s (1993, 1999) reduced/full complement analysis in that aspectual verbs like *hazime* ‘start’ and some modal predicates like *rare* ‘able’ in Japanese are ambiguous between non-restructuring verbs and restructuring verbs; when these verbs are restructuring verbs, they take a bare VP complement. Her arguments for the ambiguity come from the scope difference between a nominative object and an accusative object, originally observed in Tada (1992), and binding facts from Miyagawa (1987).

(12) ‘Control’ structure



Under his analysis, *oe* selects a reduced V' complement, which lacks an external argument. The matrix verb *oe*, however, contains a matrix external argument and hence it can be (long) passivized. This long passivization of an embedded object does not yield a minimality violation because there is no embedded subject across which the embedded object has to move. Given the “external argument suppression” analysis, short passivization of *oe* is excluded. Since there is no embedded external argument to suppress, no passivization of the embedded verb is allowed. On the other hand, when the verb is a raising verb like *das* there is no matrix external argument to suppress, and therefore no passivization of the matrix verb is allowed. Ambiguous aspectual verbs like *hazime* may take either the full VP or a reduced V'. Therefore, both embedded and long passive are possible. When the verb is a control verb, it allows movement of the embedded object. When the verb is a raising verb, it allows passivization of the embedded object.

Similar facts with respect to SH are explained under Kageyama's (1993, 1999) approach on the assumption that there is an agreement requirement between the subject and the SH morphemes. Since *oe* lacks an embedded external argument, a prerequisite for SH in terms of agreement is not satisfied. *Oe* therefore does not allow the embedded SH. On the other hand, *oe* contains a matrix external argument which can meet the agreement requirement so matrix SH is allowed. With respect to the ambiguous verb *hazime*, when it takes a full VP with an embedded external argument, it allows for embedded SH. When it takes a reduced V' complement, matrix SH is allowed.

Kageyama's (1993, 1999) analysis, which is an extension of a control/raising analysis, is not free from problems. Fukuda (2006; 2007) argues that Kageyama's control/raising distinction among the aspectual verbs is not supported by the standard diagnostics for control/raising. Fukuda demonstrates how a verb like *owar* ‘complete’, which behaves like a pure raising verb with respect to SH, passivization and subject selection, does not pass the standard diagnostics for control/raising. As exemplified in (16), *owar* allows embedded passive and embedded SH but not matrix passive and matrix SH. Additionally, it does not require an Agent subject. The behavior observed in (13) indicates that *owar* is a pure raising verb.



- (13) a. \*Shiai-no kekka-ga hyoozishi owar are-ta.  
 match-GEN results-NOM post complete PASS-PAST  
 ‘People completed posting the results of the match.’
- b. Shiai-no kekka-ga hyoozis are-owar-ta.  
 match-GEN result-NOM post PASS-complete-PAST  
 ‘People completed posting the results of the match.’
- c. \*Sensei-ga tegami-o o-kaki owari-ni nar-ta.  
 professor-NOM letter-ACC o-write complete-ni become-PAST  
 ‘The professor completed writing a letter.’
- d. Sensei-ga tegami-o o-kaki-ni nari-owar-ta.  
 professor-NOM letter-ACC o-write become-complete-PAST  
 ‘The professor completed writing a letter.’
- e. Ame-ga furi-owa-ta  
 rain-NOM fall-complete-PAST  
 ‘It finished raining.’

Despite these raising characteristics, Fukuda (2006; 2007) shows that the presumed raising verb *owar* does not pass two standard diagnostics for raising. The first diagnostic comes from idioms. Idioms have been used to argue for the control/raising distinction among the different verbs in Japanese. A raising verb, and not a control verb, can embed an idiomatic expression, preserving the idiomatic meaning. If *oe* and *owar* are a control and raising verb respectively, idioms are expected to be compatible with *owar* but not with *oe*. As expected, *oe* does not allow subject idioms. unexpectedly, however, *owar* is also incompatible with idioms, as illustrated in (14b,d).

- (14) a. Tonbi-ga taka-o un-da.  
 kite-NOM hawk-ACC give.birth-PAST  
 ‘A kite gave birth to a hawk. (=Parents have children who are much better than they are.)’
- b. Tonbi-ga taka-o umi hazime/tsuzuke/\*owar/\*oe-ta.  
 kite-NOM hawk-ACC give.birth start/continue/complete/complete-PAST  
 lit. ‘A kite started/continued/completed/completed to give birth to a hawk. (=Parents started/continued/completed to have children who are much better than they are.)’
- c. Uwasa-ga uwasa-o yon-da.  
 rumor-NOM rumor-ACC call-PAST  
 ‘Rumors spread in various directions exaggerated.’
- d. Uwasa-ga uwasa-o yobi hazime/tsuzuke/\*owar/\*oe-ta.  
 rumor-NOM rumor-ACC call start/continue/complete/complete-PAST  
 lit. ‘Rumors started/continued/completed/completed calling rumors. (=Rumors started/continued/completed/completed to exaggerate.)’ (Nishigauchi 1993: 89).

The idiom diagnostic, therefore, does not support the claim that *oe* is a control verb and *owar* is a raising verb.

Fukuda's (2006, 2007) second counter-argument comes from imperative formation. It is often argued that control verbs, but not raising verbs, form imperatives. Both *owar* and *oe* may form imperatives, however. The examples in (15) are taken from Fukuda (2007: 22).

- (15) a. Asu-madeni hon-o yomi owa-re!  
tomorrow-by book-ACC read complete-IMP  
'Finish the book by tomorrow!'  
b. Asu-made-ni hon-o yomi oe-ro!  
tomorrow-by book-ACC read complete-IMP  
'Finish the book by tomorrow!'

Thus the results of the two diagnostics fail to motivate a control/raising distinction between *oe* and *owar*.

According to Fukuda (2006; 2007), the selectional restriction imposed by *oe* 'complete' on its subject presents a puzzle. One of the arguments for the control analysis of *oe* is that it is incompatible with an inanimate subject and hence requires an animate or Agent subject in (4). Following Nishigauchi (1993), Fukuda claims that sentence in (4) is in fact ungrammatical due to the telicity requirement of the complement, and not due to the inanimate subject. According to Nishigauchi (1993), *oe* is different from *owar* 'complete' and other aspectual verbs as it requires its complement to be potentially telic. Thus *oe* can take a delimiting VP complement like 'walk up the hill' but not a non-delimiting VP like 'walk' as its complement. (The examples in (16) are taken from Fukuda 2007: 22)

- (16) a. Kodomotachi-ga aruki hazime/tsuzuke/owar/\*oe-ta.  
children-NOM walk start/continue/complete/complete-PAST  
'The children started/continued/completed/completed walking.'  
b. Kodomotachi-ga sakamimchi-o aruki oe-ta.  
children-NOM hill-ACC walk complete-PAST  
'The children completed walking (up) a hill.'

Fukuda points out that the example in (17) shows that *oe* can have an inanimate subject as long as its complement is a telic VP.

- (17) Basu-ga subete-no kaabu-o magari oe...  
bus-NOM all-GENcorner-ACC turn finish...  
'The bus finished turning all corners...'

Thus Fukuda demonstrates that the data set in (4) does not support the control/raising analysis. From these arguments, Fukuda concludes that a control/raising analysis of aspectual verbs in Japanese is untenable.

### New evidence against the bi-clausal approach

Following Fukuda (2006; 2007), I claim that aspect verbs do not introduce an embedded clause. I provide evidence for this claim on the basis of the recursion of adverbs. Japanese adverbs like *teinee-ni* ‘carefully’ and *iikagen-ni* ‘carelessly, in a slipshod manner’ are both manner adverbs that modify the event denoted by the verb. These two adverbs cannot cooccur in a single clause because of the meaning contradiction.<sup>4</sup>

- (18) a. Taro-ga teinee-ni shinamono-o tsutsunda.  
Taro-NOM careful-ADV article-ACC wrapped  
‘Taro wrapped an article carefully.’
- b. Taro-ga iikagen-ni shinamono-o tsutsunda.  
Taro-NOM careless-ADV article-ACC wrapped  
‘Taro wrapped an article carelessly.’
- c. \*Taro-ga iikagen-ni teinee-ni shinamono-o tsutsunda.  
Taro-NOM careless-ADV careful-ADV article-ACC wrapped  
‘Taro wrapped an article carefully carelessly.’

‘Carefully’ and ‘carelessly’ are manner adverbs which may modify an event like ‘wrap an article’. Accordingly, each adverb combines with the verb ‘wrapped’ in (18a) and (18b) without any problems. On the other hand, in (18c), the two adverbs cannot cooccur since it is not possible to wrap an article in both a careful and careless manner simultaneously.

Given a ban on the iteration of the antonymous adverbs in a single clause due to the meaning clash, if a sentence contains two antonymous adverbs of the same type without being ungrammatical, the sentence should be analyzed as bi-clausal in which each adverb modifies a different clause. A bridge verb construction with a CP complement clause in (19a) and a relative clause argument in (19b) support this prediction.

- (19) a. Taro-ga iikagen-ni [<sub>CP</sub> teinee-ni shinamono-o tsutsumu  
Taro-NOM careless-ADV careful-ADV article-ACC wrap.PRES  
to] itta.  
C said  
‘Taro carelessly said that he would wrap an article carefully.’

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<sup>4</sup>This does not mean that iteration of adverbs of the same type in the same clause is impossible in Japanese. In contrast to English, which does not allow iteration of adverbs of the same type (Jackendoff 1972), adverbs of the same type may iterate in Japanese. Endo (2004) observes, for example, that iteration of subject-oriented adverbs in a single clause without the coordinator is allowed. However, this does not harm the point that the single projection analysis but not the bi-clausal analysis may make a correct prediction with regard to the iteration of antonymous adverbs.

- b. Taro-ga iikagen-ni [<sub>DP</sub> teinee-ni shinamono-o tsutsumu  
Taro-NOM careless-ADV careful-ADV article-ACC wrap.PRES  
sagyoo]-o tsuzuketa.  
work-ACC continued  
'Taro carelessly continued the work of wrapping an article care-  
fully.'

In (19a,b), the first manner adverb 'carelessly' modifies the matrix predicate 'said' and 'continued' respectively, whereas the second manner adverb 'carefully' modifies the embedded predicate 'wrap'. Note that there is no concealed coordinator between the two instances of the adverbs. The fact that these adverbs can be separated by other constituents as a result of scrambling supports this point.

- (20) a. [<sub>CP</sub> teinee-ni shinamono-o tsutsumu to]<sub>i</sub> Taro-ga iikagen-ni  
careful-ADV article-ACC wrap.PRES C Taro-NOM careless-ADV  
t<sub>i</sub> itta.  
t said  
'(lit.)That he would wrap an article carefully, Taro said care-  
lessly.'
- b. [[<sub>DP</sub> Teinee-ni shinamono-o tsutsumu sagyoo]-o]<sub>i</sub> Taro-ga  
careful-ADV article-ACC wrap.PRES work-ACC Taro-NOM  
iikagen-ni t<sub>i</sub> tsuzuketa.  
careless-ADV t continued  
'(lit.)The work of wrapping an article carefully, Taro continued  
carelessly.'

Due to the Coordinate Structure Constraint, it is impossible to move a constituent out of a coordinate construction in Japanese. Given this, the grammaticality of the sentences in (20) implies that the two instances of the adverbs do not contain a concealed coordinator.

Under Kageyama's (1993, 1999) bi-clausal analysis, aspectual verbs like *owar* 'complete', *das* 'start', and *tuszu* 'continue' select a full VP. Assuming that manner adverbs adjoin to VP, the analysis predicts that these aspectual constructions will allow two antonymous manner adverbs, one modifying a higher VP and the other modifying a lower VP. Unlike the bridge verb with a CP complement, however, the aspectual verbs in question do not allow the two antonymous adverbs in (21).

- (21) a. \*Taro-ga iikagen-ni teinee-ni shinamono-o tsutsumi tsuzuketa.  
Taro-NOM careless-ADV careful-ADV article-ACC wrap continued  
'Taro continued carelessly to wrap an article carefully.'

- b. \*Taro-ga iikagen-ni teinee-ni shinamono-o tsutsumi dashita.  
Taro-NOM careless-ADV careful-ADV article-ACC wrap started  
'Taro started carefully to wrap an article carelessly.'
- c. \*Taro-ga iikagen-ni teinee-ni shinamono-o tsutsumi owatta.  
Taro-NOM careless-ADV careful-ADV article-ACC wrap completed  
'Taro carefully completed wrapping an article carelessly.'
- d. \*Taro-ga iikagen-ni teinee-ni shinamono-o tsutsumi oeta.  
Taro-NOM careless-ADV careful-ADV article-ACC wrap completed  
'Taro carefully completed wrapping an article carelessly.'
- e. \*Taro-ga iikagen-ni teinee-ni shinamono-o tsutsumi e-ru.  
Taro-NOM careless-ADV careful-ADV article-ACC wrap ABL-PRES  
'Taro can carefully wrap an article carelessly.'

Note that a verb like *tsuzuke* is compatible with a manner adverb 'carelessly', as illustrated by example (20b). Under Kageyama's bi-clausal analysis, it is therefore not clear why the two adverbs are not allowed to appear in these aspectual constructions. On the other hand, if the sentence with the verb 'continue' involves a mono-clausal structure, and hence there is only one VP, the impossibility of the two occurrences of the adverb is straightforwardly explained; the two antonymous adverbs cannot modify the same VP because of the meaning contradiction. A mono-clausal analysis, therefore, correctly predicts that these adverbs are prohibited from appearing together in (21).

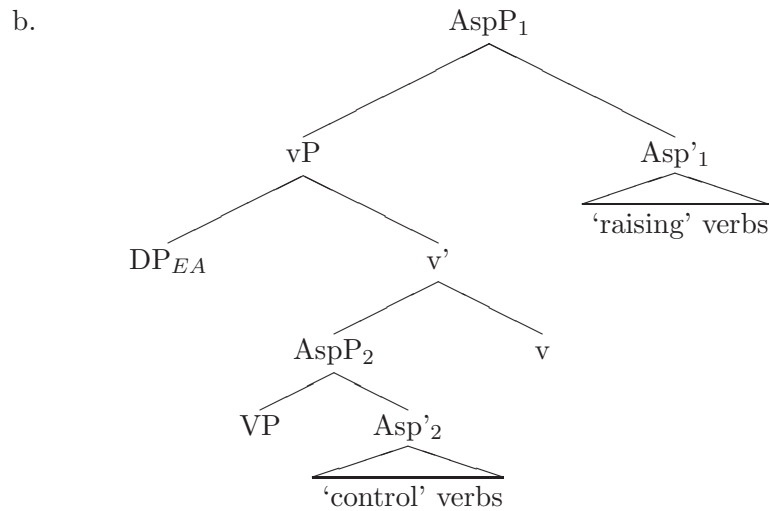
### 4.1.2 Functional projection analysis

Fukuda (2006; 2007) proposes that aspectual verbs are part of a mono-clausal structure in which the aspect heads project in two distinctive positions: Asp1, which is above vP, and Asp2, which is below vP.<sup>5</sup> When an aspectual verb is in Asp1, it provides its aspectual specification to vP. When an aspectual verb is in Asp2, it provides its aspectual specification to VP.

- (22) a. Asp1 (*das, owar, hazime, tsuzuke*) >vP > Asp2 (*oe, hazime, tsuzuke*) > VP

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<sup>5</sup>This proposal is similar to the proposal of Cinque (2006) in which aspectual verbs are distributed between the two positions, below and above VoiceP.



In example (16) of the previous subsection, it is observed that *oe* requires a telic complement, which functions to create a bound activity or an accomplishment. Given the assumption that an internal argument delimits an event (Tenny 1987), Fukuda assumes that the relevant domain for the composition of a delimited event is VP. From this he argues that *oe*, which needs a delimited complement, can only be the lower Aspect head, Asp2, since it must have access to VP. By elimination, *owar* is argued to be the higher Aspect head, Asp1.

Fukuda attributes the control or raising like properties of aspectual verbs to be the consequence of scope relations between the two positions of aspectual verbs and the position of the external argument in vP. Under his analysis, a verb like *oe* is in Asp2, and therefore under the scope of the external argument. It thus invokes a control-like interpretation. A verb like *owar* is in Asp1 and accordingly, takes scope over the external argument. It is therefore interpreted as raising-like.

Under Fukuda's (2006, 2007) analysis, passivization and honorification facts are the straightforward consequences of hierarchical relations between the two Asp positions and the passive morpheme in v. Given the assumption that passive involves an inactive v (Kratzer 1994, Chomsky 1995), *oe*, which is in Asp2, can be followed by passive morphology but cannot take a passive complement. In contrast, *owar*, which is in Asp1, can take a passive complement but cannot be followed by passive morphology.

Fukuda (2006; 2007) argues that the SH facts are also accounted for given an assumption that the SH verb *nar* 'become' occupies the v head. It has been argued that the honorific complex *o-V-ni* is a nominalized verbal projection with *ni* being a case marker (Suzuki 1989, Toribio 1990, Bobaljik and Yatsushiro 2006, Takita 2006). One argument for the nominal status of the honorific complex is that it can appear in an argument position (Takita 2006).

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- (23) a. [Sensei-no/\*ga nimotsu-no/\*o o-okuri]-ga okure-ta.  
 teacher-gen/nom package-GEN/ACC o-send-NOM delayed  
 ‘The teacher’s sending a package is delayed.’  
 b. Sensei-ga nimotsu-o o-okuri-ni nat-ta.  
 teacher-NOM package-ACC o-send-ni become-PAST  
 ‘The teacher sent a package.’

Note that the nominalized verb does not assign Accusative Case to its object in (23a). In contrast, the object is assigned Accusative Case when the honorific complex is followed by the verb *nar*. Fukuda takes this observation as an indication that *nar* ‘become’ is a type of *v*. Since *oe* occupies Asp2, it can precede honorific *nar* which is in *v* but cannot follow it. Hence, embedded SH is excluded. On the other hand, *owar* appears in Asp1, which is above *vP*. It therefore allows embedded SH and not matrix SH.

In this study, I adopt Fukuda’s (2006, 2007) functional projection approach for aspectual verbs with some modification and assume the following hierarchy. In Fukuda’s proposal the high Aspect head and the low Aspect head are structurally distinguished in terms of *vP*. Asp1 is above *vP*, while Asp2 is below *vP*. Since Fukuda assumes multiple functions of *v*, *v* in his analysis is responsible for passive voice, introduction of an external argument (cf. Kratzer 1996), etc. In contrast, I assume a *vP* decomposition approach (Ramchand 2008, among others) which argues that a *vP* is decomposed into a series of functional heads, each of which is associated with a single grammatical function. I also adopt Pylkkänen (2002) and assume that Voice P is divided into a voice head and a cause head. On the basis of these assumptions, I claim that the *vP* in Fukuda’s (2006, 2007) approach can be divided into two separate heads, a Voice P and *vP*. Voice P is responsible for the voice distinction and is located between Asp1 and Asp2, while *vP*, which is responsible for the external argument, is below Asp2, as illustrated in (24).

- (24) Asp1 ( *hazime, tsuzuke, das, owar* ) >Voice P >Asp2 ( *hazime, tsuzuke, oe* ) >*vP* >VP

## 4.2 Interaction between aspectual verbs and PPs

This section presents some compositionality facts observed between modifier PPs and the aspectual verbs *das* ‘start’, *tsuzuke* ‘continue’, and *oe* ‘complete’. From the compositionality tests, scope relations between the PPs and aspectual verbs in question were detected to be as per table in (25). *ND* means ‘not detectable’. *I/M* stands for ‘Inst/Means’.

(25)

	<i>das</i> Asp>PP	<i>das</i> PP>Asp	<i>tsuzuke</i> Asp>PP	<i>tsuzuke</i> PP>Asp	<i>oe</i> Asp>PP	<i>oe</i> PP>Asp
<b>Temp</b>	OK(s>T)	OK(T>s)	ND(c>T)	OK(T>c)	*(c>T)	OK(T>c)
<b>Loc</b>	OK	OK	ND	OK	OK	OK
<b>Com</b>	OK	*	ND	OK	OK	OK
<b>Reas</b>	OK	ND	ND	OK	*	OK
<b>Sour</b>	OK	*	ND	OK	OK	ND
<b>Goal</b>	OK	*	ND	OK	OK	ND
<b>I/M</b>	OK	*	ND	OK	OK	ND
<b>Mat</b>	OK	*	OK	*	OK	ND
<b>Man</b>	OK	*	OK	*	OK	ND

The results in (25) may indicate that the two highest PPs, Temp and Loc, can take wide scope in relation to ‘start’, but the lower PPs may not. Assuming a mono-clausal analysis of aspectual verbs à la Fukuda (2006, 2007), under which *das* ‘start’ manifests Asp1, and assuming also that an interpretation asymmetry between two constituents is reflected in a structural asymmetry, the fact that Temp and Loc may take wide scope indicates that the location of the two PPs is higher than Asp1. The location of the other PPs, however, is lower than Asp1. In what follows, I present the compositionality tests between the three aspectual verbs and each of the PPs.

### 4.2.1 Compositionality scope

Before presenting detailed data sets, clarification of the use of the term ‘scope’ is in order. What I call scope here is not the scope of operators, which is an interpretation of functions at the level of Logical Form. Rather I refer to an interpretational restriction between the constituents under composition. That the two are independent from each other is demonstrated by the next construction.

- (26) Sukunakutomo futari-no sensei-ga [<sub>Loc</sub> hotondo-no kyooshitsu-de]  
 at.least two-GEN teacher-NOM most-GEN classroom-LOC  
 oshie-dashi-ta.  
 teach-start-PAST  
 ‘At least two teachers started to teach in most of the classrooms.’
- at least two teachers>in most classrooms  
 ‘There are at least two teachers x such that x start teaching in most of the classrooms y.’
  - in most classrooms>at least two teachers  
 ‘For most of the classrooms y, there are at least two teachers x such that x start teaching in y.’



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The sentence in (26) contains a quantificational element both in the subject ‘at least two teachers’ and in the Loc PP ‘most of the classrooms’. As will be shown by example (41), the Loc PP in (26) must be interpreted within the domain of ‘start’. The quantified object ‘most of the classrooms’, which is embedded in the Loc PP, however, may be interpreted outside the domain of ‘start’, as indicated by the fact that ‘most of the classrooms’ scopes outside the quantified subject ‘at least two teachers’. This suggests that the quantifier may be moved out of the Loc PP, to a position higher than the subject, by Quantifier Raising, for example. Thus, the fact that the quantified object, which is embedded in a Loc PP, may take wide scope with respect to the subject, escaping from the domain of ‘start’, indicates that quantifier scope is different from compositionality scope, which is discussed in this section.

### 4.2.2 Temporal

Consider the pair consisting of a Temporal (Temp) PP and the aspectual morpheme *das* ‘start’. Assuming that scope is represented in structure, there are two scope readings depending on whether Temp appears above or below *das*, as schematized in (27).

- (27) a. [ [*Temp* at Time Z] [ X starts V ] ]  
b. [ X starts [ V [*Temp* at Time Z] ] ]

The reading in (27a), in which Temp appears above ‘start’, may be paraphrased as “At a specific time Z, X starts V”. The reading in (27b), in which Temp is below ‘start’, may be paraphrased as “What X starts is the following: V at a specific time Z”. A concrete example with Temp and ‘start’, possible scope readings, and two scenarios which are compatible with those readings are given in (28), (29) and (30), respectively. I assume that the verb *das* ‘start’ presupposes that the activity initiated is expected to continue for a certain period. Assuming this, the sentence in (28) presupposes that the jogging event on Monday, which is initiated by Taro, will continue for a while.

- (28) Taro-ga [*Temp* getsuyoobi-ni] zyogingu-o shi-dashi-ta.  
Taro-NOM Monday-TEMP jog-ACC do-start-PAST  
‘Taro started jogging on Monday.’

- (29) a. on Monday > start jogging  
b. start > jogging on Monday

- (30) S1: Taro has never jogged before. He decided to jog every Tuesday from now on. However, since he has to go on a business trip this Tuesday and hence has no time to jog, he initiated his jogging regime on Monday.  
S2: Taro has jogged on Fridays before. Recently, he has been working

late on Fridays. He therefore rescheduled his exercise and started to jog on Mondays.

Scenario 1 is compatible with a wide scope reading and not with a narrow scope reading of the Temp PP ‘on Monday’. Assuming that scope is represented in structure, scenario 1 can be associated with the structure in which Temp is higher than ‘start’, as schematized in (27a). It cannot be associated with the structure in which Temp is lower than ‘start’, as schematized in (27b). In contrast, scenario 2 is consistent only with the narrow scope reading of Temp. Hence it is consistent only with the structure in (27b). The fact that sentence in (28) is well-formed under either scenario indicates that Temp can be either higher or lower than ‘start’ as in (31).

(31) Temp > Asp<sub>1<sub>das</sub></sub> > Temp

Consider now the example with *tsuzuke* ‘continue’ in (32). Scenario 1 in (33) is consistent with a wide scope reading and not a narrow scope reading of Temp with respect to ‘continue’. On the other hand, scenario 2 in (33) is consistent with either of the readings and hence is not a conclusive scenario.

(32) Taro-ga [<sub>Temp</sub> kayoobi-ni] eego-o oshie-tsuzuketa.  
Taro-NOM Tuesday-TEMP English-ACC teach-continued  
‘Taro continued teaching English on Tuesday.’

(33) S1: Taro taught English on Wednesdays last semester. His schedule changed, and he kept teaching English this semester, but on Tuesdays.

S2: Taro has taught on Tuesdays before. He kept teaching English on Tuesday.

(34) a. on Tuesday > continued to teach  
b. continued > teach on Tuesday

That the sentence with Temp in (32) is fine under scenario 1 indicates that the Temp PP ‘on Tuesday’ can take wide scope with respect to the aspectual verb *tsuzuke*. Accordingly, it is inferred that Temp can be higher than *tsuzuke* as in (35).

(35) Temp > Asp<sub>Tsuzuke</sub>

Lastly, consider *oe* ‘complete’ in (36) under the two scenarios in (37).

(36) Taro-ga [<sub>Temp</sub> kayoobi-ni] tsuzuri-o oboe-oe-ta.  
Taro-NOM Tuesday-TEMP spelling-ACC memorize-complete-PAST  
‘Taro completed memorizing spellings on Tuesday.’

(37) S1: Taro has been memorizing English spellings since last Wednes-

#### 4.2. INTERACTION BETWEEN ASPECTUAL VERBS AND PPS113

day. On Tuesday he finished memorizing the spellings.

- S2: Taro joins a spelling course where he learns different spellings. The course has a series of regular tasks every day: French spellings on Monday, English spellings on Tuesday, etc. Taro has to complete the tasks in order to go on to the next level. He has worked hard and now he is done with the part of the course that happens on Tuesday, i.e. memorizing English spellings.

Scenario 1 is compatible with wide the scope reading of Temp. If we assume that the verb *oe* in (36) presupposes that Taro has been memorizing spellings on Tuesday up to now, scenario 1 becomes incompatible with the narrow scope reading of Temp. On the other hand, scenario 2 is compatible with only the narrow scope reading of Temp in relation to *oe*.

- (38) a. on Tuesday > finish memorizing spellings  
b. finish > memorizing spellings on Tuesday

The sentence is well-formed in scenario 1 but it is anomalous in scenario 2. From this, I infer that Temp must be higher than ‘complete’ as in (39).

- (39) Temp > Asp2<sub>Oe</sub>

The result of this subsection indicates that Temp may take either narrow or wide scope in relation to *das* ‘start’. Under the present mono-clausal analysis of aspectual verbs, *das* may manifest Asp1. The scope ambiguity of Temp in relation to *das* therefore indicates that Temp can be above or below Asp1. In contrast, Temp unambiguously scopes outside of *oe* ‘complete’ which manifests Asp2. This fact therefore indicates that Temp must be higher than Asp2. With respect to *tsuzuke* ‘continue’, Temp may scope outside of it. Since ‘continue’ may manifest either Asp1 or Asp2, it indicates that Temp can be higher than either Asp2 or Asp1. This agrees with the results from the scope test in relation to *das* ‘start’. The scope relation between Temp and the aspectual verbs studied is illustrated in (40).

- (40) Temp > Asp1<sub>Das/Tsuzuke</sub> > Temp > Asp2<sub>Oe/Tsuzuke</sub>

#### 4.2.3 Locative

Consider the verb *das* ‘start’ under the two scenarios in (42). Scenario 1 is compatible with only the wide scope reading of Locative (Loc), while scenario 2 is compatible with only the narrow scope reading of Loc.

- (41) Taro-ga [<sub>Loc</sub> shinshitsu-de] yoga-o renshuushi-dashita.  
Taro-NOM bedroom-LOC yoga-ACC practice.do-started  
‘Taro started practicing yoga in the bedroom.’

- (42) S1: Taro has never practiced yoga before. He planned to practice yoga regularly in the living room. Currently the living room is under renovation and he cannot use it. Therefore, he started his yoga regime in the bedroom (with a plan to keep practicing yoga in the living room after the renovation).  
 S2: Taro used to practice yoga in the living room, because it is spacious. Recently he found out that it is much easier to practice yoga on the bed. Therefore, he started practicing yoga in the bedroom.
- (43) a. in the bedroom >start practicing yoga  
 b. start > practicing yoga in the bedroom

The availability of sentence (41) under either scenario indicates Loc can be above or below ‘start’. In the present mono-clausal approach to aspectual verbs, *das* is unambiguously analyzed as Asp1. Loc can therefore be interpreted as either higher or lower than Asp1.

- (44) Loc > Asp1<sub>*das*</sub> > Loc

Consider a Loc PP in relation to *tsuzuke* ‘continue’. The sentence in (45) is well-formed in either of the scenarios in (46).

- (45) Taro-ga [<sub>Loc</sub> shinshitsu-de] hon-o yomi-*tsuzuke* ta.  
 Taro-NOM bedroom-LOC book-ACC read-continued  
 ‘Taro continued reading a book in the bedroom.’
- (46) S1: Taro was reading a book in the living room. His mother started to vacuum the living room. He therefore moved to the bedroom and continued reading the book there.  
 S2: Taro read a book in the bedroom yesterday and continued reading the book today, but in the bedroom.
- (47) a. in the bedroom > continued reading a book  
 b. continued > reading a book in the bedroom

Since scenario 1 in (46) is consistent with either the wide or narrow scope reading of Loc, it is not a conclusive scenario when deciding the position of Loc. Scenario 2 in (46), on the other hand, is more decisive, as it is compatible with only the wide scope reading of Loc. The fact that the sentence in (45) is fine under this scenario can be interpreted to show that Loc is higher than ‘continue’ as in (48).

- (48) Loc > Asp<sub>*Tsuzuke*</sub>

Lastly consider *oe* ‘complete’. The sentence in (49) is supposed to allow only the wide scope reading of Loc, in which ‘in Sapporo’ modifies the com-

#### 4.2. INTERACTION BETWEEN ASPECTUAL VERBS AND PPS115

pletion, and not the event, of the longitudinal marathon. The narrow scope reading of the Loc PP ‘in Sapporo’, which modifies the event of the longitudinal marathon, is contextually excluded since it is not possible to run through Japan in Sapporo. That the sentence in (49) is well-formed indicates that the Loc PP may take wide scope in relation to *oe*.

- (49) Taro-ga [*Loc* Sapporo-de] nihon-zyuudan marason-o hashiri-oe-ta.  
 Taro-NOM Sapporo-LOC Japan-longitudinal marathon-ACC run-complete-PAST  
 ‘Taro finished running the longitudinal marathon in Sapporo.’
- (50) a. Taro ran a longitudinal marathon in which he ran through Japan from Kyuushuu to Sapporo. He completed running the marathon in Sapporo.  
 b. #‘Taro completed an activity. The activity is to run a marathon through Japan ‘in Sapporo.’
- (51) a. in Sapporo > complete running the longitudinal marathon  
 b. complete > run the longitudinal marathon in Sapporo

The next example attempts to show that Loc may take narrow scope in relation to ‘complete’. Consider sentence (52) under the two scenarios in (53).

- (52) Taro-ga [*Loc* Kyoto-de] satsuee-o shi-oe-ta.  
 Taro-NOM Kyoto-LOC film-ACC do-complete-PAST  
 ‘Taro completed filming in Kyoto.’

In both scenarios, Taro, a movie director, makes a film in which a detective solves murders happening in Kyoto, Kobe and Osaka.

- (53) S1: Taro has been filming in Kyoto for a while. Today he is done with a murder scene in Kyoto. However, he has not filmed the murder scenes in Osaka and Kobe yet. In other words, he is done with the part of the film that happens in Kyoto.  
 S2: Taro finished filming in Osaka and Kobe yesterday. Today he filmed in Kyoto, which is a place he has never been to before. He is now done with all the filming.

Assuming that the sentence with the verb *oe* in (52) presupposes that Taro has filmed in Kyoto up to now, scenario 2 in (53) is compatible with only wide scope of Loc. On the other hand, scenario 1 in (53) is compatible with only a narrow scope reading of Loc.

- (54) a. complete > filming in Kyoto  
 b. in Kyoto > complete filming

Since the sentence in (52) is fine under either of the scenarios, it implies that Loc may be either higher or lower than ‘complete’. From this result and the result from the compositionality test in (49), I infer that Loc can appear either below or above ‘complete’ as in (55).

$$(55) \quad \text{Loc} > \text{Asp2}_{Oe} > \text{Loc}$$

The scope facts suggest that Loc may take wide scope in relation to *das*, implying that Loc may be higher than Asp1. The fact that Loc may scope over *oe* (which manifests Asp2) and *tsuzuke* (which manifests either Asp1 or Asp2) is consistent with this result. Since Loc may also take narrow scope in relation to *oe*, it indicates that Loc can be lower than Asp2. The resulting hierarchy is schematized in (56).

$$(56) \quad \text{Loc} > \text{Asp1}_{Das/Tsuzuke} > \text{Loc} > \text{Asp2}_{Oe/Tsuzuke} > \text{Loc}$$

#### 4.2.4 Comitative

Consider Comitative (Com) in relation to *tsuzuke* ‘continue’ in the sentence in (57). The two scenarios which are used to test scope are given in (58).

$$(57) \quad \text{Yamada sensei-wa } [Com \text{ Suzuki sensei-to}] \text{ kenkyuu-o shi-tsuzuketa.}$$

Yamada professor-TOP Suzuki professor-COM research-ACC do-continued

‘Professor Yamada continued to conduct research with professor Suzuki.’

- (58) S1: Professor Yamada and Professor Tanaka have been working on a research project. Last year Tanaka quit his job. and Yamada found a new collaborator, Professor Suzuki. This year, Yamada continued to work on the project, but now with Professor Suzuki.
- S2: Professor Yamada has been working on a research project with Professor Suzuki for a while and has continued to work on the research project with Professor Suzuki.

Scenario 2 is not a conclusive scenario because it is compatible with either scope reading. In contrast, scenario 1 is a more conclusive scenario since it is compatible with only the wide scope reading. Since sentence (57) is well-formed under this scenario, it is inferred that Com can be higher than ‘continue’.

$$(59) \quad \text{Com} > \text{Asp}_{Tsuzuke}$$

Consider Com with regard to *das* ‘start’ in (60). The scenario which is compatible with only narrow scope, and is hence a more decisive one, is scenario 2 in (61). On the other hand, scenario 1 in (61) is consistent only with wide scope of Com.

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- (60) Yamada-wa [<sub>Com</sub> Suzuki sensei-to] zyogingu-o shi-dashita.  
 Yamada-TOP Suzuki professor-COM jogging-ACC do-started  
 ‘Yamada started to jog with Suzuki.’
- (61) S1: Yamada has never jogged before. He planned to jog regularly. Since the gym teacher Suzuki gives good advice, Yamada initiated his jogging regime with Suzuki. He however plans to jog alone as soon as possible.  
 S2: Yamada jogged with Tanaka last year. This year he has started to jog with Suzuki.

Since the sentence in (60) is fine under scenario 2 but quite strange under scenario 1, it indicates that Com must be lower than ‘start’ as in (62).

- (62) Asp<sub>das</sub> > Comitative

Consider the sentence in (63) which contains both a Com PP and *oe* ‘complete’. The two scenarios involve the following situation: Taro sings a series of 9 songs in a concert. He decides to sing three songs with each of the following people: Mary, Hanako and John.

- (63) Taro-wa [<sub>Com</sub> Mary-to] uta-o utai-oe-ta.  
 Taro-TOP Mary-COM song-ACC sing-complete-PAST  
 ‘Taro completed singing songs with Mary.’
- (64) S1: Taro sang two songs with Mary and then one song with John. After that, he sang one song with Mary. He has now sung three songs with Mary and is therefore done with the part of the series that he sings with Mary. However, he has not sung with Hanako yet, and the singing part with John is not done yet, either. Thus, he has not finished with the whole series of songs.  
 S2: Taro has already sung three songs with John and another three songs with Hanako. He has now finished singing the last three songs with Mary, whom he just picked out from the audience (and hence had not sung with her before). Thus, he is done with the whole series of singing.

Scenario 1 in (64), where Taro is done with part of the singing activity, is compatible with only a narrow scope reading of Com with respect to ‘complete’. I assume that *oe* in (63) presupposes that Taro has sung with Mary before. In scenario 2 in (64), Taro has never sung with Mary before. Accordingly, this scenario is not compatible with a narrow scope reading of Com. What scenario 2 is compatible with, is therefore only wide scope of Com. Since the sentence in (63) is fine under either scenario, it indicates that Com can be higher or lower than ‘complete’.

The results of the scope facts in this subsection indicate that Com can take narrow scope in relation to all three functors. It cannot scope over *das* which manifests Asp1. The positions of Com in relation to the two Asp heads are therefore schematized as in (65).

$$(65) \quad \text{Asp1}_{Das/Tsuzuke} > \text{Comitative} > \text{Asp2}_{Tsuzuke/Oe} > \text{Comitative}$$

### 4.2.5 Reason

Consider Reason with respect to *tsuzuke* ‘continue’ in (66). Of the two scenarios in (67), scenario 1 is a conclusive scenario because it is compatible with only the wide scope reading of Reason in relation to ‘continue’. The availability of the sentence under this scenario indicates that Reason can be higher than *tsuzuke* ‘continue’.

$$(66) \quad \begin{array}{l} \text{Taro-ga} \quad [Reason \text{ tsukiai-de}] \quad \text{biiru-o} \quad \text{nomi-tsuzuke-ta.} \\ \text{Taro-NOM} \quad \text{to.be.nice-REASON} \quad \text{beer-ACC} \quad \text{drink-continue-PAST} \\ \text{‘Taro continued to drink beer to be nice.’} \end{array}$$

- (67) S1: At 5 PM Taro and his boss started drinking beer because they were thirsty. At 9 PM, Taro felt sick and did not want any more beer. His boss, however, wanted to drink more. To be nice to his boss, Taro continued drinking beer.
- S2: Taro has some bad habits. For example, although he dislikes the taste of beer, he drinks it to be nice to his friends. Taro’s wife has asked him to quit his bad habits. He has quit some of them, but he continues to drink beer to be nice.

$$(68) \quad \text{Reason} > \text{Asp } Tsuzuke$$

Consider now Reason in relation to ‘start’ in (69). Scenario 1 in (70) is compatible with either the wide scope or narrow scope reading of Reason in relation to ‘start’ and is therefore not decisive. On the other hand, scenario 2 in (70) is compatible only with a narrow scope reading of Reason. The fact that the sentence is fine under this scenario indicates that Reason can be lower than ‘start’.

$$(69) \quad \begin{array}{l} \text{Taro-ga} \quad [Reason \text{ tsukiai-de}] \quad \text{sake-o} \quad \text{nomi-dashi-ta.} \\ \text{Taro-NOM} \quad \text{to.be.nice-REASON} \quad \text{sake-ACC} \quad \text{drink-start-PAST} \\ \text{‘Taro started drinking sake to be nice.’} \end{array}$$

- (70) S1: Taro has never drunk sake before. His colleagues, however, like sake and they often invite Taro for drinks. To be nice, he started drinking sake.
- S2: Taro drinks a lot of sake and has many excuses to do so. Before, he drank sake because he thought it was good for his health.



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Now, he is often invited to a bar by his colleagues and drinks sake to be nice to them.

Lastly, consider the sentence with a Reason PP and *oe* ‘complete’ in (71). The two scenarios described in (72) presuppose the following: Taro is attending a Karate course. The course consists of two exercises where students learn techniques for two different purposes; one for self-protection, and the other for an attack. In order to complete the course, Taro has to finish both exercises.

- (71) Taro-wa [*Reason* goshin-no mokuteki-de] renshuu-o shi-oe-ta.  
 Taro-TOP self-defense-GEN purpose-REASON exercise-ACC do-complete-PAST  
 ‘Taro completed practicing the techniques for self-protection.’
- (72) S1: Taro finished practicing the techniques for an attack last week and has now finished practicing the techniques for self-protection. Thus, he has finished the entire course.  
 S2: Taro finished practicing the techniques for self-protection but he still has not finished practicing the techniques for an attack. Thus, he is done with half of the course.

The sentence is fine under scenario 1 in (72). Since scenario 1 is compatible with either a wide scope or narrow scope reading of Reason in relation to ‘complete’, it is not a decisive scenario. Scenario 2 in (72), on the other hand, is compatible with only narrow scope of Reason. Since the sentence is anomalous under this scenario, it indicates that Reason must be outside the scope of ‘complete’.

The results of this subsection indicate that Reason must be higher than Asp2. Assuming the position of Reason to be above Asp2 and below Asp1, this is consistent with the results which suggest that Reason may take wide scope in relation to ‘continue’ and narrow scope in relation to ‘start’.

- (73) Asp1<sub>Das/Tsuzuke</sub> > Reason > Asp2<sub>Oe/Tsuzuke</sub>

### 4.2.6 Source

#### Two types of Source

Source seems to be divided into at least two types, one type that modifies the Path of an object of motion (henceforth Source<sub>P(ath)</sub>) and the other type that modifies the control over an Agent (henceforth Source<sub>C(ontrol)</sub>), as exemplified in (74).

- (74) a. [*SourceP* Tenzyoo-kara] mizu-ga more tei-ru.  
 ceiling-SOURCE water-NOM leak asp-PRES  
 ‘Water is leaking from the ceiling.’

- b. Taro-ga [<sub>SourceC</sub> daidokoro-kara] ima-no TV-o mi-ta.  
 Taro-NOM kitchen-SOURCE living.room-GEN TV-ACC watch-PAST  
 ‘Taro watched the TV which is in the living room from the kitchen.’

In (74a), the Source PP ‘from the ceiling’ denotes the path of the leaking event of water. The sentence in (74b) roughly means that Taro was in the kitchen and watched a TV which was in the living room. As the interpretation indicates, the event denoted by the VP is a TV watching activity, which does not involve a directed motion. Here, what the Source PP ‘from the kitchen’ modifies, seems to be Taro’s control over the TV watching event. In this sense, the Source PP in (74b) is inferred to modify Agent control. Source<sub>P</sub> seems to be in a lower position of clause structure. Svenonius (In press) argues that a Path of an object of motion is associated with a functional head Path which is below V. I adopt this idea and assume that Source<sub>P</sub>, which denotes a Path, is below VP. If Source<sub>P</sub> is generated within VP, it is expected that Source<sub>P</sub> will behave like an object with respect to the compositionality test. For example, in relation to the Aspectual verb *tsuzuke* ‘continue’ (and in fact in relation to all three aspectual verbs), an object does not seem to take wide scope.

- (75) Taro-ga LGB-o yomi-tsuzuke-ta.  
 Taro-NOM LGB-ACC read-continue-PAST  
 ‘Taro continued to read LGB.’

The sentence in (75) is fine under scenario 1 in which Taro read *LGB* yesterday and kept on reading it today. The sentence, however, is not acceptable under scenario 2 in which Taro read *The minimalist Program* yesterday but read *LGB* today. Scenario 1 is compatible with either the wide or narrow scope reading of the object in relation to ‘continue’. Scenario 2 is compatible with only a wide scope reading. The ill-formedness of the sentence in (75) under scenario 2 thus indicates that the object must be lower than ‘continue’, which is consistent with a standard view that an object is below VP.

So far, the results of the compositionality tests in this section indicate that PPs Temp, Loc, Com, and Reason can be higher than ‘continue’. If Source<sub>P</sub> is in the Aspect domain where these PPs are presumed to be, Source<sub>P</sub> is expected to scope over ‘continue’. Like an object, however, Source<sub>P</sub> must scope under ‘continue’. Consider the example with Source<sub>P</sub> and *tsuzuke* in (76).

- (76) [<sub>SourceP</sub> Shinshitsu-no tenzyoo-kara] mizu-ga more-tsuzuke-tei-ru.  
 bedroom-GEN ceiling-SOURCE water-NOM leak-continue-TEI-PRES  
 ‘Water continues to leak from the bedroom ceiling.’

There are two scenarios to be considered. Scenario 1 is where water was leaking from the bedroom ceiling yesterday and is still leaking from it today.

## 4.2. INTERACTION BETWEEN ASPECTUAL VERBS AND PPS121

This scenario is compatible with either the wide or narrow scope reading of  $Source_P$ . On the other hand, scenario 2 goes as follows: water was leaking from the kitchen ceiling yesterday and is still leaking today, but from the bedroom ceiling. This scenario is compatible with only the wide scope reading of  $Source_P$ . Since the sentence in (76) is anomalous under scenario 2, it is inferred that  $Source_P$  must be lower than ‘continue’.

The fact that  $Source_P$  patterns with an argument in terms of the ‘continue’ compositionality test strongly suggests that the two Source PPs are in different positions.  $Source_P$  is presumed to be lower than V, while  $Source_C$  seems to be in a higher place, which will be demonstrated in the next paragraphs.

(77)  $Source_C > Asp_{T_{suzuke}} > vP > V > Source_P$

Given the presumed hierarchy in (77), what remains to be clarified is the position of  $Source_C$  in terms of the other two aspectual functors *das* ‘start’ and *oe* ‘complete’.

### Source<sub>C</sub>

Let us now consider *das* ‘start’. Of the two scenarios that are to be examined, scenario 1 goes as follows: Taro has never phoned his mother before. He has decided to call his mother regularly from Kyoto where he starts his new job next week. At the moment, however, he is on vacation in Hakone so he will initiate his new regime from Hakone (with the intention of calling his mother from Kyoto from next week on). This scenario is compatible with only the wide scope reading of  $Source_C$ . On the other hand, scenario 2 goes as follows: Taro used to call his mother from Osaka when he lived there. He recently moved to Hakone and regularly phones his mother from there. This scenario is compatible with only the narrow scope reading of  $Source_C$  with respect to ‘start’. The fact that the sentence in (78) is well-formed in scenario 2 but not in scenario 1 indicates that  $Source_C$  must be lower than *das* ‘start’.

(78) Taro-ga [ $Source_C$  Hakone-kara] haha-ni denwa-o kake-dashita.  
 Taro-NOM Hakone-SOURCE mother-DAT phone-ACC call-started  
 ‘Taro started to phone his mother from Hakone.’

Consider the sentence with ‘continue’ in (79) under two scenarios. Scenario 1 goes as follows: Taro has been calling his mother from Tokyo and has kept calling his mother from Tokyo. This scenario is compatible with either the wide or narrow scope reading of  $Source_C$ . On the other hand, scenario 2 goes as follows: Taro had been calling his mother from Osaka where he worked. Recently, he moved to Tokyo and has continued to call his mother but from there. This scenario is compatible with only wide scope of  $Source_C$ .

- (79) Taro-ga [*Source<sub>C</sub>* Tokyo-kara] haha-ni denwa-o kake-tsuzuketa.  
 Taro-NOM Tokyo-SOURCE mother-DAT phone-ACC call-continued  
 ‘Taro continued to phone his mother from Tokyo.’

Since the sentence is fine under scenario 2, it is inferred that *Source<sub>C</sub>* can be outside the scope of ‘continue’.

Let us consider lastly completive *oe* in the sentence in (80). There are two scenarios to be considered. In both scenarios Taro sets off a big set of fireworks to entertain his guests at a party. The fireworks must be ignited from both ends, one end of which hangs on the handrail of the veranda, the other end of which hangs over a branch of a tree in the garden. Imagine scenario 1 in which Taro ignited the end of the fireworks from the veranda, but not the other end from the garden. In other words, the setting off of the fireworks has only been half completed. The sentence in (80) is well-formed under this scenario, which is compatible with only a narrow scope reading of *Source<sub>C</sub>*.

- (80) Taro-ga [*Source<sub>C</sub>* beranda-kara] shikakehanabi-o tenkashi-oe-ta.  
 Taro-NOM veranda-SOURCE set.firework-ACC ignite.do-complete-PAST  
 ‘Taro completed igniting the fireworks from the veranda.’

In the second scenario, Taro ignited the fireworks from the garden first, and then from the veranda. That is to say, the setting of the fireworks has been completed. This scenario is compatible with either the wide or narrow scope reading of *Source<sub>C</sub>* and therefore is not decisive when determining the location of *Source<sub>C</sub>* in relation to ‘complete’. The availability of the narrow scope reading, which is detected from scenario 1, indicates that *Source<sub>C</sub>* can be below *Asp<sub>oe</sub>*.

The results of this subsection indicates that *Source<sub>C</sub>* can appear above *tsuzuke* ‘continue’. Since *tsuzuke* ‘continue’ may manifest either *Asp1* or *Asp2*, the potential positions of *Source<sub>C</sub>* are the one above *Asp1* and the one above *Asp2*. Since the results also indicate that *Source<sub>C</sub>* must be lower than *Asp1*, which is manifested by *das* ‘start’, it is inferred that *Source<sub>C</sub>* appears in between *Asp1* and *Asp2*. Taking into account the results of the compositionality test in relation to *oe* ‘complete’, which indicate that *Source<sub>C</sub>* can be below *Asp2*, the positions of *Source<sub>C</sub>* with respect to the three functors can be schematized as in (81).

- (81)  $Asp1_{Tsuzuke/Das} > Source_C > Asp2_{Tsuzuke/Oe} > Source_C$

#### 4.2.7 Goal

Consider sentence (82) under two scenarios. Scenario 1 goes as follows: A plane was flying from Tokyo to Tottori. On its way to Tottori, the captain was informed that the Tottori airport was closed due to a strike. He therefore

#### 4.2. INTERACTION BETWEEN ASPECTUAL VERBS AND PPS123

changed direction and continued to fly but to Osaka. This scenario is only compatible with wide scope of the Goal PP in relation to ‘continue’. Conversely, Scenario 2 goes as follows: A plane was flying from Okinawa to Osaka. On its way to Osaka, it had to stop in Fukuoka, since there was an engine problem which needed immediate repairs. After a short stop in Fukuoka, the plane continued to Osaka. This scenario is not conclusive because it is compatible with either reading. Since the sentence is fine under scenario 1, it is inferred that Goal can be higher than ‘continue’.

- (82) Kichoo-ga [*Goal* Osaka kuukoo-ni] hikooki-o tobashi-tsuzuketa.  
 captain-NOM Osaka airport-GOAL airplane-ACC fly-continued  
 ‘The captain continued flying the plane to Osaka airport’.

Consider now Goal in relation to *das* ‘start’ in (83). Scenario 1 goes as follows: Hankyu Airlines is a very small company that has never flown a big aircraft before. Since they got financial support from the government this year, they decided to fly a big aircraft regularly to Narita. The Narita airport, however, is fully booked this month. Hankyu can use the Narita airport starting next month only. Luckily, Hankyu got a temporary deal with the Haneda airport this month. Hankyu, therefore, initiated the regular route to Haneda with the intention of changing to Narita after a month. This scenario is compatible with only wide scope of Goal. Scenario 2 goes as follows: Hankyu has flown a big aircraft to Narita before. Recently, the fees Narita charges for the use of the airport have increased significantly, and Hankyu cannot afford them any longer. Therefore, they started flying the big aircraft to Haneda, which charges less fees. This scenario is consistent only with narrow scope of Goal in relation to ‘start’. Since the sentence in (83) is fine under scenario 2, but is anomalous under scenario 1, it is inferred that Goal must be in the scope of ‘start’.

- (83) Hankyu-kookuu-ga [*Goal* Haneda kuukoo-ni] oogatahikooki-o tobashi-dashita.  
 Hankyu.airline-NOM Haneda airport-GOAL big.airplane-ACC fly-started  
 ‘The Hankyu airline started flying a big aircraft to the Haneda airport’.

Lastly, consider Goal in the sentence with *oe* ‘complete’ in (84). Scenario 1 goes as follows: A plane was flying long distance from Taiwan to Osaka. Since the plane is small and has a small tank, it must stop at Naha, which is half way to Osaka, to refuel. The captain has flown the plane to Naha airport and so is done with half the distance. This scenario is compatible with only narrow scope of Goal in relation to ‘complete’. Scenario 2 goes as follows: A plane was flying long distance from Hong Kong to Naha. After many hours, the captain finally completed flying to Naha. This scenario is compatible with either scenario and hence it is not conclusive. The sentence

is fine under scenario 1 and therefore, I infer that Goal can be in the scope of ‘complete’.

- (84) Kichoo-ga [*Goal* Naha kuukoo-ni] hikooki-o tobashi-oeta.  
 captain-NOM Naha airport-GOAL airplane-ACC fly-completed  
 ‘The captain completed flying the plane to the Naha airport’.

From the results of this subsection, the following locations of Goal in relation to Asp1 and Asp2 are extracted in (85).

- (85) Asp1<sub>*Tsuzuke/Das*</sub> > Goal > Asp2<sub>*Tsuzuke/Oe*</sub> > Goal

### 4.2.8 Instrumental/Means

Consider a sentence with an Inst (Inst) PP and *tsuzuke* ‘continue’. This sentence in (86) is fine under either scenario in (87).

- (86) Taro-ga [*Inst* bunkaboochoo-de] sakana-o kiri-tsuzuke-ta.  
 Taro-NOM western.style.knife-INST fish-ACC cut-continue-PAST  
 ‘Taro continued to cut fish with a western style knife.’

- (87) S1: Taro started slicing fish with a sashimi slicer. When he finished half of the filet, the slicer broke. He therefore continued slicing the fish, but with a western style knife.  
 S2: Taro used a western style knife to cut fish while his sashimi slicer was under repair. He liked the western style knife very much, so he continued to cut fish with it when he got his sashimi slicer back.

Scenario 2 is compatible with either a wide or narrow scope reading of Inst in relation to ‘continue’ and is therefore not decisive. Scenario 1, on the other hand, is compatible only with the wide scope reading of Inst. The fact that the sentence in (86) is fine under scenario 1 indicates that Inst can be higher than ‘continue’.

Consider now the sentence with *das* ‘start’ in (88) under two scenarios in (89).

- (88) John-ga [*Inst* fooku-de] soba-o tabe-dashi-ta.  
 John-NOM fork-INST buckwheat.noodle-ACC eat-start-PAST  
 ‘John started to eat buckwheat noodles with a fork.’

- (89) S1: John has never eaten buckwheat noodles before. Recently, he learned that they are very healthy so he decided to eat them regularly, with chopsticks. However since he had no chopsticks at home, he initiated his regime with a fork (until he buys chopsticks).

## 4.2. INTERACTION BETWEEN ASPECTUAL VERBS AND PPS125

S2: John used to eat buckwheat noodles with chopsticks before. He broke his index finger and so could no longer use chopsticks. Therefore, he started eating buckwheat noodles with a fork.

Scenario 1 in (89) is compatible with only the wide scope reading of *Inst*. In contrast, scenario 2 in (89) is compatible with only the narrow scope reading of *Inst*. Since the sentence is fine under scenario 2, but not under scenario 1, it indicates that *Inst* must be lower than *das* ‘start’.

Lastly, consider *Inst* in relation to *oe* ‘complete’. The sentence is fine under either of the two scenarios in (91).

- (90) Taro-ga [*Inst* bunkaboochoo-de] sakana-o kiri-oe-ta.  
 Taro-NOM western.style.knife-INST fish-ACC cut-complete-PAST  
 ‘Taro completed to cut fish with a western style knife.’
- (91) S1: Taro is a sushi cook. When he slices fish, he uses different knives, depending on the type of fish. Today, he must slice an octopus with a western knife and a sea bream with a sashimi slicer. He took the octopus first and completed cutting it with a western knife. He still has to cut the sea bream with a slicer.  
 S2: Today Taro had to slice an octopus with a western knife and a sea bream with a sashimi slicer. He completed cutting the sea bream with a slicer an hour ago, and has now completed cutting the octopus with a western style knife.

Scenario 2 in (91) is consistent with either the wide or narrow scope reading of *Inst* and accordingly, is not decisive. In contrast, scenario 1 in (91) is consistent only with the narrow scope reading of *Inst*. Since the sentence is fine under this scenario, it indicates that *Inst* can be lower than ‘complete.’ The result of this last data set is in harmony with the result of the second data set that suggests that *Inst* must be lower than *Asp1*, which is manifested by *das* ‘start’.

- (92)  $Asp1_{TsuZuke/Das} > Inst/Means > Asp2_{TsuZuke/Oe} > Inst/Means$

According to the results of the first data set, *Inst* can be higher than ‘continue’, which manifests either *Asp1* or *Asp2*. This indicates that *Inst* can also appear in between *Asp1* and *Asp2* as in (92).

### 4.2.9 Material

Consider a Material PP with respect to *tsuzuke* ‘continue’ in sentence (93). There are two scenarios to consider. Scenario 1 goes as follows: Taro made ice cream from apples before, and he still makes ice cream from apples now. The sentence in (93) is fine under this scenario. This scenario is compatible with



either a wide or narrow scope reading of Material, and hence is not conclusive. On the other hand, scenario 2, where Taro made ice cream from strawberries before but makes ice cream from apples now, is consistent only with a wide scope reading of the Material PP. Since the sentence in (93) is not well-formed under scenario 2, it indicates that Material must be in the scope of ‘continue’. Material must therefore be lower than ‘continue’.

- (93) Taro-ga [*Material* ringo-kara] aisu-o tsukuri-tsuzuketa.  
 Taro-NOM apple-MATERIAL ice.cream-ACC make-continued  
 ‘Taro continued to make ice cream from apples.’

Consider now the sentence with Material and ‘start’ in (94) under two scenarios. Scenario 1 goes as follows: Taro has never made ice cream before. He decided to regularly make ice cream from strawberries from the garden. Since the strawberries in the garden were not yet ripe, he started making ice cream from apples (until the strawberries ripen). This scenario is consistent only with the wide scope reading of Material. Scenario 2 contains a situation where Taro has made ice cream from strawberries before but has now started to make ice cream from apples. This scenario is compatible with only a narrow scope reading of Material. Since the sentence is fine under scenario 2 but it is anomalous under scenario 1, it indicates that Material must be lower than *das*.

- (94) Taro-ga [*Material* ringo-kara] aisu-o tsukuri-dashita.  
 Taro-NOM apple-MATERIAL ice.cream-ACC make-started  
 ‘Taro started to make ice cream from apples.’

The last example of this subsection involves *oe* ‘complete’ in (95). The two scenarios to consider presuppose that Taro has to make a special soup stock that consists of two different brothes, one from seaweed and one from dried fish. Scenario 1 goes like this: Taro first made soup stock from dried fish and then from seaweed, finishing the whole soup stock making activity. The sentence in (95) is fine under this scenario. However, this scenario is not decisive, because it is compatible with either the wide or narrow scope reading of Material. Scenario 2 goes as follows: Taro made soup stock from seaweed but has not made soup stock from dried fish yet. Therefore, he is only half done with the soup making activity. This scenario is more decisive, since it is consistent with only a narrow scope reading of Material in relation to ‘complete’. The fact that the sentence in (95) is well-formed under scenario 2 fact indicates that Material can be lower than ‘complete’.

- (95) Taro-ga [*Material* konbu-kara] dashi-o tsukuri-oe-ta.  
 Taro-NOM seaweed-MATERIAL soup.stock-ACC make-complete-PAST  
 ‘Taro completed to make soup stock from seaweeds.’



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Since Material may take narrow scope in relation to *oe* ‘complete’, which manifests Asp2, it seems that Material is in a position lower than Asp2. With regard to the position in between Asp1 and Asp 2, it is consistent with the results of the test that indicate that Material must be lower than *das* ‘start’. This position, however, seems to be excluded by the results that indicate that Material must be lower than *tsuzuke* ‘continue, which manifests either Asp1 or Asp 2 as in (96).

$$(96) \quad \text{Asp1}_{T_{\text{tsuzuke}}/D_{\text{as}}} > \text{Asp2}_{T_{\text{tsuzuke}}/O_{\text{e}}} > \text{Material}$$

### 4.2.10 Manner

The sentence in (97) is well-formed under the scenario which contains a situation where I swam the breaststroke the day before yesterday and continued to swim the breaststroke yesterday. This scenario is compatible either with a wide or narrow scope reading of Manner, and therefore is not decisive. There is another scenario which is consistent only with the wide scope reading of Manner. In this scenario, I swam butterfly the day before yesterday and continued to swim yesterday, but used the breaststroke. The sentence is not well-formed under this scenario, and therefore indicates that Manner must be lower than ‘continue’.

$$(97) \quad \begin{array}{lll} \text{Watashi-wa} & [_{\text{Manner}} \text{hiraoyogi-de}] & \text{oyogi-tsuzuketa.} \\ \text{I-TOP} & \text{breaststroke-MANNER swim-continued} & \\ & \text{‘I continued to swim the breaststroke.’} & \end{array}$$

Let us now consider *das* ‘start’. The sentence in (98) is fine under the following scenario: I have never swum before. Recently, I decided to regularly swim the crawl. However, since I’m afraid of putting my face under water, I cannot do the crawl for now. Therefore, I started my swimming regime with the breaststroke, which is easy for me (until I manage to put my face under water). This scenario is compatible with only the wide scope reading of Manner. On the other hand, the second scenario where I swam butterfly before but now started swimming the breaststroke as a regular exercise, is compatible with only the narrow scope reading of Manner. The fact that the sentence in (98) is well-formed in the second scenario but is anomalous in the first scenario indicates that Manner must take narrow scope in relation to *das* ‘start’.

$$(98) \quad \begin{array}{lll} \text{Watashi-wa} & [_{\text{Manner}} \text{hiraoyogi-de}] & \text{oyogi-dashita.} \\ \text{I-TOP} & \text{breaststroke-MANNER swim-started} & \\ & \text{‘I started to swim breaststroke.’} & \end{array}$$

Lastly, consider *oe* ‘complete’. The context for the sentence in (99) is a situation where I have to swim two kilometers with two different swimming

styles, one kilometer in the manner of breaststroke and one kilometer in the manner of butterfly. Scenario 1 goes as follows: I swam one kilometer doing the butterfly first. I then swam one kilometer doing the breaststroke. Hence I am finished with the whole exercise. Sentence (99) is fine under this scenario. This scenario is consistent with either a wide or narrow scope reading of Manner, and therefore is not a decisive scenario. The second scenario goes as follows: I swam one kilometer of breaststroke, and have yet to swim one kilometer of butterfly. Thus, I am half done with the exercise. This scenario is a helpful one, since this is in agreement only with the narrow scope reading of Manner. The fact that the sentence is fine under the second scenario indicates that Manner can take narrow scope in relation to *oe* ‘complete’.

- (99)    Watashi-wa [*Manner* hiraoyogi-de]            ichikiro-o            oyogi-oeta.  
           I-TOP                                    breaststroke-MANNER one.kilometer-ACC swim-completed  
           ‘I completed swimming a kilometer with breaststroke.’

Since Manner seems to scope outside of *oe* ‘complete’, it seems that Manner can be lower than Asp 2. Like Material, Manner must take narrow scope in relation to *tsuzuke* ‘continue’ and *das* ‘start’. This excludes the possibility that Manner appears either in the position between Asp1 and Asp2 or above Asp1 as in (100).

- (100)    Asp1<sub>*Tsuzuke/Das*</sub> > Asp2<sub>*Tsuzuke/Oe*</sub> > Manner

### 4.2.11 Summary

The results of this section indicate the following positions for the PPs, which are schematized in (101).<sup>6</sup>

- (101)    Temp > Loc > **Asp1** > Temp > Loc > Com > Reason > Source<sub>C</sub> >  
           Goal > Inst/Means > **Asp2** > Loc > Com > Source<sub>C</sub> > Goal >  
           Inst/Means > Material > Manner

Based on the distribution of the PPs in (101), PPs can be divided into three classes in (102).

- (102)    a. PPs that have to be below Asp2 (Material and Manner)  
           b. PPs that have to be above Asp2 (Temp, Loc and Reason)  
           c. PPs that can be either below or above Asp2 (Loc, Com, Source<sub>C</sub>,  
           Goal, Inst/Means)

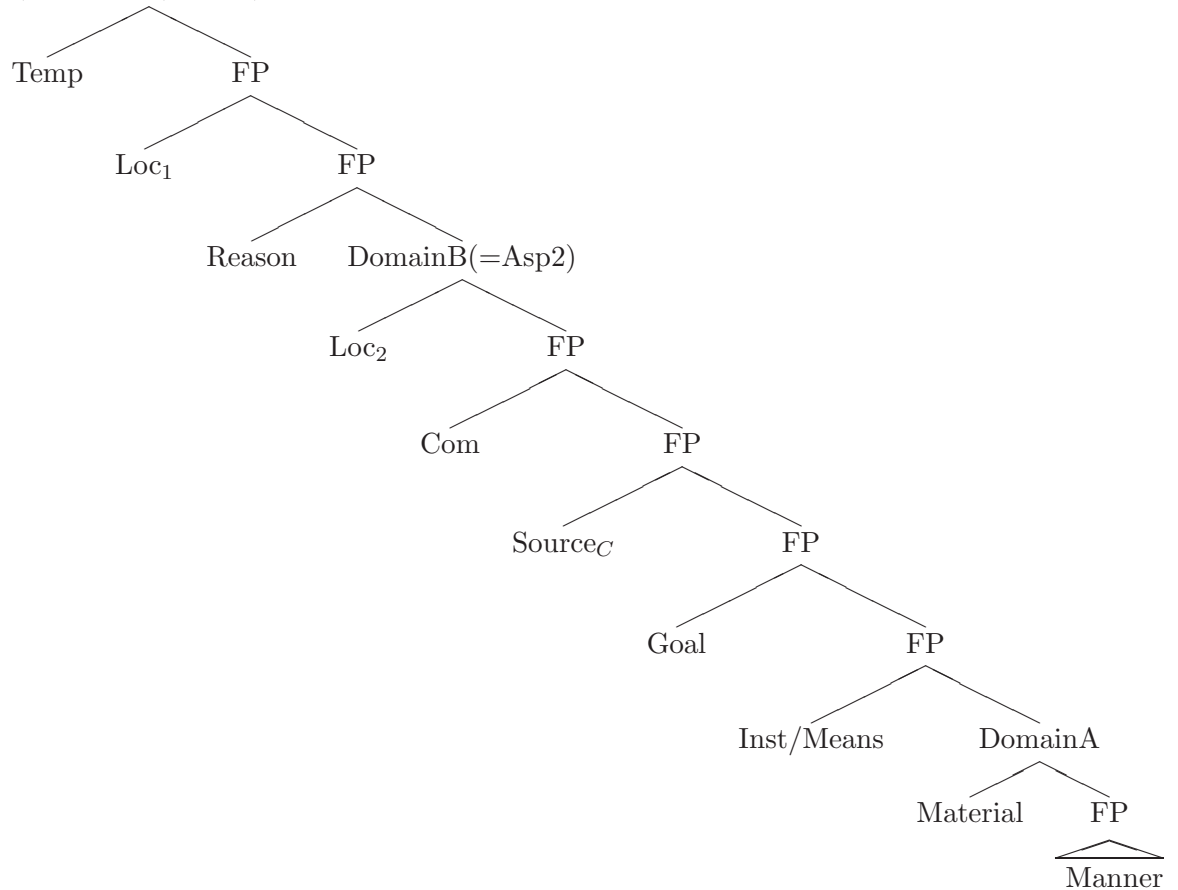
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<sup>6</sup>The results of the compositionality tests do not exclude the possibility that some of the PPs appear above Asp1. This possibility will be discussed in the later sections. At the moment, however, I would like to ignore this possibility for the sake of simplicity.

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One hypothesis which explains the distribution of the PPs (or the three-way classification of the PPs) in (102) is that the PPs are base-generated in different syntactic domains A, B, and C, as schematized in (103). In (103), *FP* represents an arbitrary functional phrase in which a PP is generated.

(103) DomainC(=Asp1)



One assumption which I need to make here is that *Loc* is ambiguous between *Loc 1* and *Loc 2*. Given this assumption, in the hypothesized structure in (103), *Temp* and *Loc 1* (and possibly *Reason*) are generated in domain C which roughly corresponds to *Asp1*. *Com*, *Source<sub>C</sub>*, *Goal* and *Inst/Means* are generated in domain B which roughly corresponds to *Asp2*. *Material* and *Manner* are generated in domain A which is below *Asp2*. The idea that different types of PPs belong to different domains is reminiscent of the proposal by Ernst (2002) in which predicational adverbs take different semantic arguments such as a proposition and an event. In the following chapter, I will give an outline of my proposal where PPs select for a different type of semantic object, which is similar to Ernst's proposal.

In this hypothesis, the distributional properties of Material and Manner in (102a) and the distributional properties of Temp, Loc and Reason in (102b) are straightforwardly captured. One way to account for the distributional properties of the intermediate PPs, Com, Source<sub>C</sub> and Inst/Means in (102a), is to say that these PPs can only move to the positions right above Asp2, where they are generated.

If this hypothesis is on the right track, the prediction which arises is that the intermediate PPs, Com, Source<sub>C</sub>, Goal and Inst/Means, cannot appear in a position higher than Asp1, for example, in the modal domain. In the following sections, I will demonstrate that this prediction is confirmed. To be more specific, I will show that Temp and Loc, and not Com and Inst/Means, can appear in the modal domain, which is higher than Asp1. Assuming that modal markers are generated in a hierarchical fashion, roughly schematized as Mod<sub>Evidential</sub> > Mod<sub>Epistemic</sub> > Mod<sub>Obligation</sub> > Mod<sub>Volitional</sub> > Mod<sub>Abl</sub> (cf. Narrog 2009), I will argue, based on scope facts, that Temp and Loc may appear in several positions below Mod<sub>Obligation</sub>. Before examining the scope relation between the modal functors and Temp and Loc, however, the position of Asp1 and Asp2 in relation to the Modal heads must be clarified. In the next section, I will argue that Asp1 and Asp2 are below the Aspect head that is associated with a progressive and result state reading Asp<sub>Result/Prog</sub>, which is below the modal functors (cf. Narrog 2009).

## 4.3 Aspect

### 4.3.1 Result/Progressive aspect

In this section, based on morpheme order restrictions and VP-fronting facts, I argue that the aspectual verbs that I discussed in the previous section, *tsuzuke* ‘continue’, *das* ‘start’ and *oe* ‘complete’, are in the scope of the aspectual marker *tei*, which expresses a result state and a progressive interpretation. I also present scope data which show that the higher PPs, Temp and Loc, can be either above or below Asp<sub>Result/Prog</sub>, while the lower PPs, Com and Inst, must be below Asp<sub>Result/Prog</sub>. Before presenting the detailed data, a short description of the Asp<sub>Result/Prog</sub> marker *tei* is presented. As exemplified in (104), *tei* yields a progressive interpretation when it combines with an activity verb, while it yields a result state or a perfect interpretation when it combines with an achievement verb.<sup>7</sup>

- (104) a. Taro-ga hashi tei-ru.  
           Taro-NOM run TEI-PRES  
           ‘Taro is running.’

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<sup>7</sup>Some formal analyses of these readings can be found in Ogihara (1998), Kusumoto (2003), among others.

- b. Inu-ga shin dei-ru.  
 dog-NOM die TEI-PRES  
 ‘A dog is dead.’

(104a), in which *tei* is attached to an activity verb ‘run’, denotes that the activity of running is in progress. (104b), in which *tei* combines with an achievement verb ‘die’, describes that the dog is in a state of being dead.

Aspectual verbs *das* ‘start’, *oe* ‘complete’ and *tsuzuke* ‘continue’ must precede the aspectual marker *tei*, as illustrated by the examples in (105a,c,e). The reverse order is not available, as exemplified in (105b, d,f).

- (105) a. Kensaku-enzin-no riyoo-kaisuu-ga heri-tsuzuke  
 search-engine-GEN use-number.of.times-NOM decrease-continue  
*tei-ru*.  
 TEI-PRES  
 ‘The use of the search engine has continued to decrease.’  
 (zen.seesaa.net/article/110207018.html)
- b. \*Kensaku-enzin-no riyoo-kaisuu-ga her-tte(i) tsuzuke-ru.  
 search-engine-GEN use-number.of.times-NOM decrease-TEI continue-PRES  
 ‘(lit.)The use of the search engine starts to have decreased.’
- c. Taro-wa sono hon-o moo yomi-oe *tei-ru*.  
 Taro-TOP that book-ACC already read-complete TEI-PRES  
 ‘Taro has already completed reading that book.’
- d. \*Taro-wa sono hon-o moo yon-dei oe-ta.  
 Taro-TOP that book-ACC already read-TEI complete-PRES  
 ‘(lit.)Taro already completed having read that book.’
- e. Yuki-ga toke-dashi *tei-ru*.  
 snow-NOM melt-start TEI-PRES  
 ‘Snow has started to melt.’
- f. \*Yuki-ga toke-*tei* dasu-u.  
 snow-NOM melt-TEI start-PRES  
 ‘Snow starts to have melted.’

Assuming the Mirror Principle, the morpheme order between the aspectual verbs and the state/progressive morpheme *tei* indicates that  $Asp_{Result/Prog}$ , which is manifested by *tei*, is structurally higher than the Asp head, which is manifested by verbs like *das*.

The sequence like *V-dashi-TEI* in (105e) is not a mere linear order effect but it is rather a reflection of the hierarchical properties of the morphemes, as schematized in (106).

- (106) ..[[[V] dashi] *tei*]...

The structure in (106) is supported by a constituency test like “VP-fronting”. Given that only a constituent undergoes movement, what is moved by VP-

fronting can be concluded to be a constituent. Aspectual verbs like *das* ‘start’ can be fronted together with the VP, leaving the aspectual marker *tei* behind, as in (107b). This suggests that *das* forms a constituent with the verb root, excluding the aspectual marker *tei*. On the other hand, sentence (107c), in which *tei* pied-pipes the fronted VP, leaving the aspectual verb *das*, is ungrammatical. This indicates that there is no constituent with *...yon-dei* ‘...read-tei’ that excludes the aspectual verb *das*.

- (107) a. Taro-wa sono hon-o moo yomi-dashi tei-ru.  
Taro-TOP that book-ACC already read-start TEI-PRES  
‘Taro has already started reading that book.’
- b. [Sono hon-o moo yomi-dashi]-sae Taro-wa shi-tei-ru.  
that book-ACC already read-start-FOC Taro-TOP do-TEI-PRES  
‘What Taro has done is already started reading that book.’
- c. \*[Sono hon-o moo yon-dei]-sae Taro-wa shi-dashi-ta.  
that book-ACC already read-TEI-FOC Taro-TOP do-start-PAST  
‘What Taro has started doing is already reading that book.’

*Tsuzuke* ‘continue’ and *oe* ‘complete’ behave like *das* with respect to VP-fronting. They can pied-pipe the fronted VP, leaving the aspectual marker *tei* behind. The reverse, i.e. fronting the VP together with *tei*, leaving the aspectual verbs behind, is not allowed as in (108).

- (108) a. Taro-wa sono hon-o moo yomi-oe tei-ru.  
Taro-TOP that book-ACC already read-complete TEI-PRES  
‘Taro has already completed reading that book.’
- b. [Sono hon-o moo yomi-oe]-sae Taro-wa shi-tei-ru  
that book-ACC already read-complete-FOC Taro-TOP do-TEI-PRES  
‘What Taro has done is already completed reading that book.’
- c. \*[Sono hon-o moo yon-dei]-sae Taro-wa shi-oe-ta.  
that book-ACC already read-TEI-FOC Taro-TOP do-complete-PAST  
‘What Taro has completed doing is already reading that book.’
- d. Taro-wa sono hon-o yomi-tsuzuke tei-ru.  
Taro-TOP that book-ACC read-continue TEI-PRES  
‘Taro has already continued reading that book.’
- e. [Sono hon-o yomi-tsuzuke]-sae Taro-wa shi-tei-ru.  
that book-ACC read-continue-FOC Taro-TOP do-TEI-PRES  
‘What Taro has done is continued reading that book.’
- f. \*[Sono hon-o yon-dei]-sae Taro-wa shi-tsuzuke-ta.  
that book-ACC read-TEI-FOC Taro-TOP do-continue-PAST  
‘What Taro has continued doing is reading that book.’

The VP-fronting facts together with the morpheme order restrictions indicate that the aspectual head  $Asp_{Result/Prog}$  manifested by *tei* is structurally

higher than the aspectual head, Asp1, which is manifested by the verb *das* (or *tsuzuke*). The data sets also suggest that *tei* is higher than *tsuzuke* and *oe*. Since *oe* and the ambiguous verb *tsuzuke* manifest Asp2, one may claim that *tei* may also appear in between Asp1 and Asp2. This, however, predicts that *tei* may form a constituent with the VP to the exclusion of the aspectual verb, i.e. it predicts that (107) and (108c,f) would be grammatical. This is an incorrect prediction and therefore I infer that *tei* does not appear in the position in between Asp1 and Asp2, but rather above Asp1, as schematized in (109).

(109)  $Asp_{Result/Prog} > Asp1_{Das} > \dots V$

### 4.3.2 Interaction between result/progressive aspect and PPs

Assuming the position of  $Asp_{Result/Prog}$  to be higher than Asp1, the question that arises from the previous section is whether the higher PPs, those which appear above Asp1, can be higher than  $Asp_{Result/Prog}$ . In order to provide an answer to this question, I examine the location of the higher PPs, Temp and Loc, and the location of the two lower PPs, Com and Inst/Means, with respect to the aspectual marker *tei*. The result of the examination is summarized in table (110). (In the table (110), *A* stands for ‘ $Asp_{Result/Prog}$ ’.)

(110)

	Temp	Loc	Com	Inst/Means
<i>tei</i>	T>A, A>T	L>A, A>L	*C>A, A>C	* I/M>A, A>I/M

According to the results, both Temp and Loc exhibit scope ambiguity, while Com and Inst/Means display only narrow scope in relation to the state/progressive morpheme *tei*. The detailed data are found below.

#### Temp

A state reading refers to a state resulting from an event that has occurred at some point. When this reading combines with a temporal interpretation represented by a Temp PP, there are at least two possible interpretations available depending on which constituent the Temp PP combines with. (111a) represents a narrow scope interpretation of Temp in relation to  $Asp_{Result/Prog}$  in which the Temp PP combines with the VP first. (111b), on the other hand, represents a wide scope reading of Temp in relation to  $Asp_{Result/Prog}$  in which the Temp PP combines with the aspectual construction.

(111) Result state readings

- a. [X is in a state resulting from an event denoted by [ V that has occurred [ $T_{emp}$  at Time Z]]]
- b. [[ $T_{emp}$  at Time Z] [ X is in a state resulting from an event denoted by V that has occurred]]

Consider the sentence in (112) with respect to the two scenarios which are compatible with the readings in (111). The scenario compatible with the narrow scope reading of Temp in (111a) goes as follows: The leaves fell on Wednesday morning, and on Thursday the tree was in a state of having no leaves. Contrastively, the scenario that is compatible with the wide scope reading of Temp in (111b) is as follows: The leaves fell on Tuesday night, and on Wednesday morning the tree was in a state of having no leaves.

- (112) [ $T_{emp}$  Suiyoo-no asa-ni] happa-ga ochi-TEI-ta.  
 Wednesday-GEN morning-TEMP leaf-NOM fall-TEI-PAST  
 ‘The leaves had fallen on Wednesday morning.’

Since the sentence is fine under either of the scenarios, it is inferred that Temp can be either higher or lower than  $Asp_{Result/Prog}$ .

### Locative

Consider the sentence with a Loc PP in (113). The sentence is well-formed under scenario 1, where an old man died on the shore. Since this scenario is compatible with either the wide or narrow scope reading of Loc, it is not conclusive. A more conclusive scenario is where an old man died offshore last night when his boat capsized due to high waves and the current carried his body this morning to the shore. This scenario is compatible with only the wide scope reading of Loc.<sup>8</sup>

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<sup>8</sup>On the other hand, in the sentence in (i), a Loc PP does not seem to scope outside *tei*. Consider the sentence in (i).

- (i) Kisha-ga [ $Loc$  kantee-no kaigishitsu-de] shitsumon-o  
 reporter-NOM official.residence-GEN conference.room-LOC question-ACC  
 zyunbishi-tei-ru.  
 prepare.do-TEI-PRES  
 ‘The reporters have prepared for questions in a conference room at the official residence of the prime Minister.’

The sentence in (i) is anomalous under the scenario where the reporters prepared for the questions at home and they are in a state, in the conference room, resulting from preparing for the questions. Since this scenario is compatible with only wide scope of Loc, it is inferred that Loc must be lower than  $Asp_{Result/Prog}$  in contradiction of the result of the compositionality test in 113. I have at the moment no explanation as to why the sentence in (i) disallows wide scope of Loc.



- (113) Roozin-ga [<sub>Loc</sub> namiuchigiwa-de] shin-dei-ru.  
 old.man-NOM shore-LOC die-TEI-PRES  
 ‘An old man is dead on the shore.’  
 or, ‘An old man has died on the shore.’

That the sentence is fine under this scenario indicates that *Loc* can be higher than *Asp<sub>Result/Prog</sub>*.

### Comitative

Consider a *Com* PP the sentence (114) with respect to two scenarios. The first scenario is where Taro is in a state resulting from doing homework with his teacher. This scenario is at least compatible with the narrow scope reading of the *Com* PP ‘with the teacher’. The second scenario is as follows: Taro’s teacher always forces him to do the homework. When he is with his teacher, Taro is in a state resulting from doing homework. The second scenario is compatible with only wide scope of *Com*.

- (114) Taro-ga [<sub>Com</sub> sensee-to] shukudai-o shi-tei-ru.  
 Taro-NOM teacher-COM homework-ACC do-TEI-PRES  
 ‘Taro has done the homework with the teacher.’

Since the sentence is fine under the first scenario and not under the second scenario, I infer that *Com* must be lower than *Asp<sub>Result/Prog</sub>*.

### Instrumental/Means

Lastly, consider *Inst* in relation to *tei* in sentence (115). There are two scenarios to be considered. The first scenario is where Taro did a rough sketch in pastels and then finished the picture in watercolor. This scenario is compatible with a narrow scope reading of *Inst*. The second scenario goes as follows: Taro goes to a drawing course, where he learns how to draw step by step. The first step is to make a rough sketch with a pencil and the second step is to finish drawing with pastels. This scenario is compatible with only a wide scope reading of *Inst*, i.e. with a pastel, he will be in a state resulting from making a rough sketch.

- (115) Taro-ga [<sub>Inst</sub> pasuteru-de] shitae-o kai-tei-ru.  
 Taro-NOM pastel-INST rough.sketch-ACC draw-TEI-PRES  
 ‘Taro has made a rough sketch with pastels.’

Since the sentence is fine under the first scenario but is unacceptable under the second scenario, it is inferred that *Inst* must be lower than *Asp<sub>Result/Prog</sub>*. To sum up, the results of the compositionality tests indicate that the highest PP *Temp* may appear above *Asp<sub>Result/Prog</sub>*. In contrast, *Loc*, *Com* and

Inst/Means cannot appear above  $\text{Asp}_{\text{Result/Prog}}$  but rather below it. Overall, the results of the compositionality test suggest the hierarchy in (116).

$$(116) \quad \text{Asp}_{\text{Result/Prog}} > \text{Temp} > \text{Loc} > \text{Asp}_{\text{Result/Prog}} > \text{Com} > \text{Inst/Means}$$

In the next section, I argue that the aspect marker *tei* is linked to two different positions in the lower part of the modal hierarchy extracted from Narrog's (2009) study on Japanese modals. I will then examine where these PPs appear in the modal hierarchy.

## 4.4 Modals

Narrog (2009) presents a study of fine-grained Modal categories in which the traditional modal types like epistemic, evidential, deontic, etc are further divided into subtypes. This section presents (i) Narrog's typology of modals as well as the modal hierarchy extracted from his study and (ii) modifications to the modal hierarchy in terms of the location of the aspectual marker *tei*. More specifically, I argue against Narrog who proposes five positions for the same aspect functor,  $\text{Asp}_{\text{Result/Comp(/Prog)}}$ , which is manifested by the morpheme *tei*. Adopting an ambiguity approach to *tei* (Ogihara 1998, Sugita 2008, among others), I argue that the morpheme *tei* lexicalizes two different aspectual functors. One is responsible for the experiential aspect reading while the other is responsible for the current situation reading (or the result state/progressive reading). Each of these functors appears in a unique position in the hierarchy.

### 4.4.1 Fine-grained modal types: Narrog (2009)

In his corpus study, Narrog (2009) examines the (mutual) embedding possibilities between the different types of modal markers as well as the embedding possibilities between the modal markers and the other grammatical categories like Aspect and Tense. Narrog observes that there is an asymmetry in the embedding possibilities between different types of modals. For example, both the volitional modal *hoshii* 'want' and the deontic strong necessity modal *nakerebanaranai* 'must' must be outside the scope of the abilitative *rare*. As the ungrammaticality of the (b)-sentences in (117) and (118) indicates, the reverse order between the abilitative morpheme and the volitional morpheme, and between the abilitative morpheme and the deontic strong necessity morpheme, are not possible.<sup>9</sup>

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<sup>9</sup>*Deki* in (117) is a lexically frozen potential word that are not produced by adding the *rare* suffix. Most of the instances of *deki* is the potential version of the light verb *su* 'do'.

- (117) a. ...hanashi-o kichinto kiku koto-ga *deki* te *hoshi-i*  
 ...talk-ACC properly listen thing-NOM do.ABL te want-PRES  
 shi...  
 and...  
 ‘I want them to be able to listen to someone talking, and...’  
 (Narrog 2009: 179)
- b. \*...hanashi-o kichinto kiku koto-ga *hoshi-ku* te *deki-ru*  
 ...talk-ACC properly listen thing-NOM want te do.ABL-PRES  
 shi..  
 and...  
 ‘(lit.) I am able to want them to listen to someone talking,  
 and...’
- (118) a. kairo-o yonde rikai-suru koto-ga *deki-nakerebanarana-i*.  
 circuit-ACC read.and understand-do thing-NOM do.ABL-must-PRES  
 ‘You must be able to read and understand electrical circuits.’  
 (Narrog 2009: 181)
- b. \*kairo-o yonde rikai-suru koto-o *shi-nakerebanarana-rare-ru*.  
 circuit-ACC read.and understand-do thing-NOM do-must-ABL-PRES  
 ‘(lit.) You are able to have to read and understand electrical  
 circuits.’

Given the mirror principle, the examples in (117) and (118) therefore indicate that the deontic strong necessity modal head  $\text{Mod}_{DN2}$  (the label is taken from Narrog 2009) and the volitional modal head  $\text{Mod}_{Volitional}$  are structurally higher than the abilitative modal head  $\text{Mod}_{Abl}$ .

On the other hand, deontic and volitional modals are in the scope of epistemic and evidential modals, but not vice versa. The examples in (119a,c) show that *nakerebanaranai* ‘must’ and *tai* ‘want’ must be embedded by an epistemic modal like *hazu* ‘must’. The reverse is not possible, as illustrated by the examples in (119b,d).

- (119) a. Asu Tokyo-ni ik-*anebanaranai rashii*.  
 tomorrow Tokyo-GOAL go-must seem  
 ‘(He/she) seems to have to go to Tokyo tomorrow.’
- b. \*Asu Tokyo-ni ik-u *rashii nebanaranai*.  
 tomorrow Tokyo-GOAL go-seem must  
 ‘(lit.) He/she must seem to go to Tokyo tomorrow.’
- c. Taro-wa mizu-ga nomi-*tai-hazu-da*.  
 Taro-TOP water-NOM drink-want-should-COPL  
 ‘Taro should want to drink water.’
- d. \*Taro-wa mizu-ga nomu-*hazu-dei-tai*.  
 Taro-TOP water-NOM drink-should-TEI-want  
 ‘(lit.) Taro wants to be expected to drink water.’

The asymmetry in embedding possibilities indicates that  $\text{Mod}_{DN2}$  and  $\text{Mod}_{Volitional}$  are structurally lower than epistemic and evidential modal heads. The data sets so far suggest the following hierarchy of modals.

$$(120) \quad \text{Mod}_{Epistemic} > \text{Mod}_{DN2} > \text{Mod}_{Volitional} > \text{Mod}_{Abl}$$

Under the Cartographic approach to syntactic structure (cf. Cinque 1999; 2006), the results of Narrog's study may be presented in a hierarchical fashion, as exemplified in (121). The lowest number signals the highest position in the hierarchy.

- (121) (Adopted from Narrog 2009: 235)
1. **Mod**<sub>SA1</sub> Imperative *e, re, ro*
  2. **Mod**<sub>SA2</sub> Hortative *yoo* 'let's!'
  3. **Mod**<sub>EP1</sub> Speculative *daroo* 'probably'
  4. **Mod**<sub>EV1</sub> Reportive *soo* 'allegedly'
  5. **Mod**<sub>EP2</sub> Epistemic possibility *kamoshirenai* 'may', 'could'
  6. **Mod**<sub>EV2</sub> Inferential evidentiality *yoo* 'appear', *mitai*, (non-reportive) *rashii* 'look like'
  7. **Mod**<sub>EP3</sub> Epistemic necessity *hazu* 'must'
  8. **Mod**<sub>DN1</sub> Weak deontic necessity *beki* 'should' *rebaai*
  9. **Asp**<sub>Result/Compl</sub> *tei*
  10. **Mod**<sub>DN2</sub> Strong deontic necessity: *nakerebanaranai* 'must'
  11. **Asp**<sub>Result/Compl</sub> *tei*
  12. **Mod**<sub>Vol</sub> *tai* 'want', *te hoshii* 'wish'
  13. **Asp**<sub>Result/Compl</sub> *tei*
  14. **Mod**<sub>EV3</sub> Predictive *soo* 'look'
  15. **Asp**<sub>Result/Compl/Progress</sub> *tei*
  16. **Mod**<sub>Abl</sub> *e* 'able', *(ra)re* 'able'
  17. **Asp**<sub>Result/Compl/Progress</sub> *tei*

Narrog eventually abandons the cartographic approach to his Japanese data (121) due to the overlapping positions of the aspectual marker *tei*. As shown in (121), the modal hierarchy extracted from Narrog's study exhibits large areas of scope overlap between modal markers and other grammatical markers like Aspect. For example, an aspect marker *tei* which manifests **Asp**<sub>Result/Compl</sub> can either precede or follow **Mod**<sub>Abl</sub>, **Mod**<sub>EV3</sub>, **Mod**<sub>Vol</sub>, and **Mod**<sub>DN2</sub>. Consider the following examples with *tei* and an abilitative modal *rare*. *Tei* can either precede (122a) or follow (122b) the abilitative morpheme *(ra)re*, which is in the lowest part of the Modal domain.

- (122) a. Tomeru mono-dake-ga anshin-shi-te kurashi-*tei-rare*-ru.  
 rich person-only-NOM safety-do-GER live-TEI-ABL-PRES  
 ‘Only rich people can live free from care (these days).’  
 (Narrog 2009: 234)
- b. 58 kyuu-de maundo-o ori-ta. Ii kanzi-de nage-*rare*  
 58 ball-ADV mound-ACC step.down.PAST good feeling-ADV pitch-ABL  
*tei*-ta-node zannen desu.  
 TEI-PAST -REASON regret COPL  
 ‘I left the mound after throwing 58 pitches. As I was being able  
 to pitch feeling pretty good, it’s a disappointment.’  
 (Narrog 2009: 234)

Narrog claims that *tei* in (122a) and *tei* in (122b) do not have a significant meaning difference and hence they are manifestations of a single aspectual head. Because of the optionality of ordering in (122), Narrog claims that this aspectual head can occupy a slot either above or below  $\text{Mod}_{Abl}$ . This idea, however, is not compatible with the cartographic approach. Under Cinque’s (1999, 2006) cartographic approach, with the exception of negation, each functional head which is associated with a different meaning, is rigidly fixed. Therefore only one functor can, in principle, occur in any unique position of the hierarchy. Since the Japanese data indicate that there are multiple positions for an aspect head, Narrog claims that there is no evidence for distinct positions in a functional hierarchy of categories, at least with respect to the aspectual marker *tei*. He therefore does not adopt the cartographic approach.<sup>10</sup>

In this study, I adopt Narrog’s (2009) presumed modal hierarchy in (121) with some modification. With regard to the “overlapping” problem of the aspectual marker *tei*, I argue against Narrog’s multiple positions of  $\text{Asp}_{Result/Compl}$  and propose that there is only one position for each of the different types of aspectual markers. More specifically, with regard to the position below and above  $\text{Mod}_{Abl}$ , I adopt an ambiguity approach for *tei* and argue that experiential *tei* (henceforth  $\text{Asp}_{Exp}$ ) occupies the position directly above  $\text{Mod}_{Abl}$ . The progressive or the result state *tei* or the current situation reading (henceforth  $\text{Asp}_{Prog/Result}$ ) occupies the position between  $\text{Mod}_{Abl}$  and  $\text{Asp}1$  (Ambiguity

<sup>10</sup>Narrog’s second argument against Cinque’s cartographic approach is that there are some mismatches between the Japanese hierarchy in (121) and Cinque’s hierarchy which is presumed to be universal in terms of the placement of some categories. The first mismatch is observed with respect to the placement of evidential modals and epistemic modals. In Cinque’s hierarchy there is one position for the evidential modals, which is higher than all epistemic modals. The results of Narrog’s investigation suggest that in Japanese there are three positions for the evidential modals, which are ranked lower than (at least one of the) epistemic modals. The second mismatch is found in relation to volitional and deontic modals. Cinque’s hierarchy ranks the volitional modal higher than deontic modals, while Narrog’s study suggests the reverse ordering.

analyses of *tei* between the experiential reading and the current situation reading are found in Ogihara 1998, Shirai 2000, Sugita 2008). I will then argue that there is one more position for *tei*, a position for a resultant state *tei* (henceforth *Asp<sub>Resultant</sub>*), between *Mod<sub>DN1</sub>* and *Mod<sub>DN2</sub>*

- (123) Mood<sub>SA1</sub> >... Mod<sub>DN1</sub> > **Asp<sub>Resultant</sub>** > Mod<sub>DN2</sub> > Mod<sub>Vol</sub> > Mod<sub>EV3</sub>  
> **Asp<sub>Exp</sub>** > Mod<sub>Abl</sub> > **Asp<sub>Prog/Result</sub>** > Asp1

#### 4.4.2 Clearing the aspect positions in the modal field

##### Two aspect markers: the Experiential *tei*

In the previous section, the main readings of the morpheme *tei*, the progressive and result state readings, were introduced. In what follows, I present another reading of *tei*, the experiential reading (“perfect” reading in Shirai 2000), which has not received as much attention in the literature as the other two readings of *tei* have. Some examples of the experiential *tei*, which are taken from Sugita (2008: 346), are given in (124).

- (124) a. Mari-wa ima made-ni san kai kono kawa-de oyoi-dei  
Mari-TOP now up.to-ni three time this river-LOC swim-TEI  
ru.  
PRES  
‘Mari has swum in this river three times up to now.’  
(Mari has the experience of swimming in this river three times up to now.)
- b. Mari-wa ima made-ni san kai igirisu-ni it-tei ru.  
Mari-TOP now up.to-ni three time England-GOAL go-TEI PRES  
‘Mari has gone to England three times up to now.’  
(Mari has the experience of going to England three times up to now.)

As the translations may suggest, the experiential *tei* gives rise to a meaning in which the event denoted by the verb occurred prior to the reference time; the event is not ongoing at the reference time. These sentences are therefore anomalous if Mari is still swimming in the river or is still in England now. In this sense, the meaning of the experiential *tei* is distinguished from both the meaning of the progressive and the result state *tei*, which are exemplified in (125). Both progressive and result state *tei* yield a meaning in which the event denoted by the verb must hold at the reference time. For instance, in the sentence with the progressive *tei* in (125a), Mari’s swimming activity must go on at the reference time ‘now’. Similarly, in the sentence with a result state reading of *tei* in (125b), Mari’s state that resulted from going to

England which took place in the past must still hold now. These sentences are, therefore, anomalous if Mari is not swimming now or if she is not in England now.

- (125) a. Mari-wa ima kawa-de oyoidei ru.  
 Mari-TOP now river-LOC swim-TEI PRES  
 ‘Mari is swimming in the river now.’  
 b. Mari-wa ima igirisu-ni it-tei ru.  
 Mari-TOP now England-GOAL go-TEI PRES  
 ‘Mari has gone to England and she is there now.’

Thus, with respect to interpretation, progressive *tei* and result state *tei* can be grouped together as opposed to experiential *tei*. This two-way classification is further supported by syntactic evidence in the literature (e.g., Fujii 1966, Kudo (1995), Ogihara 1998, Sugita 2008).<sup>11</sup> One criteria for the distinction between the two types of *tei* comes from the distribution of co-occurring adverbials. Based on Fujii’s (1966) observation, Sugita (2008) shows that experiential *tei* is compatible with a past-time adverbial in the non-PAST tense form, whereas result state *tei* and progressive *tei* are not.

- (126) Mari-wa kyonen kono kawa-de oyoidei ru.  
 Mari-TOP last.year this river-LOC swim-TEI PRES  
 Exp: ‘Mari has had an experience of swimming in this river last year.’  
 Prog: # ‘Mari was swimming in this river last year.’ (Sugita 2008: 353)  
 (127) Mari-wa kyonen igirisu-ni it-tei ru.  
 Mari-TOP last.year England-GOAL go-TEI PRES  
 Exp: ‘Mari has had an experience of going to England last year.’  
 Res: # ‘Mari was in England last year.’ (Sugita 2008: 353)

As the translations suggest, the sentences with the present tense morpheme in (126) and (127) do not contain either the progressive reading or the result state reading, indicating that these readings are incompatible with the past-time adverbial.

Sugita (2008) observes that if there is tense agreement between an adverbial and tense, the experiential reading must disappear. Thus the sentences in (128) and (129) unambiguously contain the progressive and result state reading, respectively.

- (128) Mari-wa kyonen kono kawa-de oyoidei ta.  
 Mari-TOP last.year this river-LOC swim-TEI PAST

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<sup>11</sup>A unified view of *tei* can be found in Nishiyama 2004.

Exp: #‘Mari had an experience of swimming in this river last year.’  
 Prog: ‘Mari was swimming in this river last year.’ (Sugita 2008: 354)

- (129) Mari-wa kyonen igirisu-ni it-tei ta.  
 Mari-TOP last.year England-GOAL go-TEI PAST

Exp: #‘Mari had an experience of going to England last year.’  
 Res: ‘Mari was in England last year.’ (Sugita 2008: 354)

Another criteria which is presented in the literature comes from the interpretation of the subject. Sugita (2008) observes that experiential *tei* requires the exhaustive reading of the subject, while the exhaustive reading of the subject is not obtained with the progressive or the result state *tei* construction. Kuroda (1965; 2005) first recognizes that there are two interpretations of the *ga*-marked subjects in Japanese: an exhaustive listing reading and a non-exhaustive (or descriptive) reading. The example of each reading is illustrated in (130).

- (130) a. Taro-ga nihonjin da.  
 Taro-NOM Japanese COPL  
 ‘(Of all the people we are talking about) Taro (and only Taro) is Japanese.’  
 b. Oya, Taro-ga soko-ni iru.  
 oh, Taro-NOM there-LOC exist  
 ‘Oh, Taro is there.’

In the exhaustive reading in (130a), the subject *Taro-ga* is picked out among the people in the definite list of the speaker. On the other hand, the *ga*-marked subject in (130b) does not contain the exhaustive listing. (130b) simply describes the fact that Taro is there. Some diagnostics that are used to distinguish these two readings are found in the literature. Kiss (1988) observes that a sentence with an exhaustive subject coordination does not entail the sentence without one of the coordinates, as illustrated by the example in (131). In contrast, a sentence with a non-exhaustive subject coordination entails the sentence without one of the coordinates, as in (132). Consider the examples in (131) and (132).

- (131) a. Taro-to Ziro-ga nihonjin da.  
 Taro-and Ziro-NOM Japanese COPL  
 ‘(Of all the people we are talking about) Taro and Ziro (and only Taro and Ziro) are Japanese.’  
 b. #Taro-ga nihonjin da.  
 Taro-NOM Japanese COPL  
 ‘(Of all the people we are talking about) Taro (and only Taro) is a Japanese.’



- (132) a. Taro-to Ziro-ga soko-ni iru.  
 Taro-and Ziro-NOM there-LOC exist  
 ‘Taro and Ziro are there.’  
 b. Taro-ga soko-ni iru.  
 Taro-NOM there-LOC exist  
 ‘Taro is there.’

Sentences in (131a), in which the coordinated subjects *Taro* and *Ziro* contain an exhaustive reading, does not entail sentence (131b), which lacks one of the coordinated subjects *Ziro*. In contrast, the sentence in (132a), which contains the coordinated subjects with a non-exhaustive reading, may entail the sentence in (132b) without *Ziro*. Thus the entailment test distinguishes the sentence with an exhaustive reading from the one without an exhaustive reading.

Sugita (2008) observes that the exhaustive listing reading is obtained with the experiential *tei* construction, while the non-exhaustive reading of the subject is obtained with the resultative and the progressive *tei* construction.

- (133) a. Mari-ga ima made-ni san kai kono kawa-de oyoi-dei  
 Mari-NOM now up.to-ni three time this river-LOC swim-TEI  
 ru.  
 PRES  
 ‘Mari and only Mari has the experience of swimming in this  
 river three times up to now.’  
 b. Mari-ga ima made-ni san kai igirisu-ni it-tei ru.  
 Mari-NOM now up.to-ni three time England-GOAL go-TEI PRES  
 ‘Mari and only Mari has the experience of going to England  
 three times up to now.’
- (134) a. Mari-ga ima kawa-de oyoi-dei ru.  
 Mari-NOM now river-LOC swim-TEI PRES  
 ‘Mari is swimming in the river now.’  
 b. Mari-ga ima igirisu-ni it-tei ru.  
 Mari-NOM now England-GOAL go-TEI PRES  
 ‘Mari went to England and she is there now.’

The experiential *tei* constructions in (133) do not pass the coordination entailment test, as illustrated by the examples in (135) and (136).

- (135) a. Mari-to Taro-ga ima made-ni san kai kono kawa-de  
 Mari-and Taro-NOM now up.to-ni three time this river-LOC  
 oyoi-dei ru.  
 swim-TEI PRES  
 ‘Mari and Taro and only Mari and Taro have the experience of  
 swimming in this river three times up to now.’

- b. #Mari-ga ima made-ni san kai kono kawa-de oyoidei  
 Mari-NOM now up.to-ni three time this river-LOC swim-TEI  
 ru.  
 PRES  
 ‘Mari and only Mari has the experience of swimming in this  
 river three times up to now.’
- (136) a. Mari-to Taro-ga ima made-ni san kai igirisu-ni  
 Mari-and Taro-NOM now up.to-ni three time England-GOAL  
 it-tei ru.  
 go-TEI PRES  
 ‘Mari and Taro and only Mari and Taro have the experience of  
 going to England three times up to now.’
- b. #Mari-ga ima made-ni san kai igirisu-ni it-tei ru.  
 Mari-NOM now up.to-ni three time England-GOAL go-TEI PRES  
 ‘Mari and only Mari has the experience of going to England  
 three times up to now.’

Conversely, the result state and progressive *tei* constructions in (134) and (134b) pass the coordination tests, as illustrated by the examples in (137).

- (137) a. Mari-to Taro-ga ima kawa-de oyoidei ru.  
 Mari-and Taro-NOM now river-LOC swim-TEI PRES  
 ‘Mari and Taro are swimming in the river now.’
- b. Mari-ga ima kawa-de oyoidei ru.  
 Mari-NOM now river-LOC swim-TEI PRES  
 ‘Mari is swimming in the river now.’
- c. Mari-to Taro-ga ima igirisu-ni it-tei ru.  
 Mari-and Taro-NOM now England-GOAL go-TEI PRES  
 ‘Mari-and Taro-NOM have went to England and they are there  
 now.’
- d. Mari-ga ima igirisu-ni it-tei ru.  
 Mari-NOM now England-GOAL go-TEI PRES  
 ‘Mari went to England and she is there now.’

The results of the entailment tests thus support Sugita’s claim that experiential *tei* involves an exhaustive list reading while progressive and result state *tei* involve a non-exhaustive reading.

Lastly, Kudo (1995) observes experiential *tei*, but not result state *tei*, is compatible with a Loc PP with *de*, which only modifies a dynamic predicate. In (138a), the Loc PP ‘at church in Switzerland’ denotes the location of the event of getting married, which took place in the past, but it does not denote the location of the result state of being married.

- (138) a. Kanozyo-wa suisu-no kyookai-de kekkon-shi tei-ru.  
 she-TOP Switzerland-GEN church-LOC marriage-do TEI-PRES  
 ‘she has gotten married at church in Switzerland.’
- b. \*Genzai kanozyo-wa suisu-no kyookai-de kekkon-shi  
 now she-TOP Switzerland-GEN church-LOC marriage-do  
 tei-ru.  
 TEI-PRES  
 ‘she is married at church in Switzerland.’ (Kudo 1995: 119)

Thus, the data sets above strongly indicate that experiential *tei* should be distinguished from result state and progressive *tei*, which form a natural class.

### The Current situation *tei*

In this study, I propose that experiential *tei* occupies the position above abilitive modal  $\text{Mod}_{Abl}$  whereas the progressive and result state *tei* occupy the position below  $\text{Mod}_{Abl}$ . The example of each reading in relation to  $\text{Mod}_{Abl}$  is given in (139). I claim that *tei* in (139a) contains a current situation (in this case, a progressive) interpretation, while *tei* in (139b) contains an experiential interpretation.<sup>12</sup>

- (139) a. Taro-wa 10 pun mogut-TEI-re-ru.  
 Taro-TOP 10 minutes dive-TEI-ABL-PRES  
 ‘Taro is able to be dive for 10 minutes.’
- b. (Zenkai-no sensui-de) Taro-wa 10 pun mogu-re-tei-ru.  
 (previous diving-at) Taro-TOP 10 minutes dive-ABL-TEI-PRES  
 ‘(At the previous diving) Taro has been able to dive for 10 minutes.’  
 (Taro has the experience of being able to dive for 10 minutes.)

My initial motivation for the distinction between (139a) and (139b) comes from interpretational difference between the two. It seems that like the experiential *tei* statement, the sentence in (139b) gives rise to a meaning in which the event denoted by the verb occurred prior to the reference time. Further, the event does not hold at the reference time. The sentence in (139a), on the other hand, does not give rise to such a reading. In fact, the sentence in (139a) does not have to presuppose that the event denoted by the verb occurred at all. This point is supported by the examples in (140). The sentence in (139a) is fine in the context where the event denoted by the verb has not happened before. Consider the context and the examples in (140). The sentence in (139a) with *te-re* is fine in the context given in (140).

<sup>12</sup>Japanese abilitive predicates are formed either by attaching *rare* to a verb stem which ends with an open syllable or by attaching *e* to a verb stem which ends with a closed syllable. *Rare*, furthermore, can alternate with *re*, as illustrated in (139).

- (140) ‘Taro is training to become a diver who dives without an air tank. After many months of hard training his lungs became very strong and he can dive for longer periods of time. Although he has not dived for more than 5 minutes up to now, if he keeps up this tempo, he will soon be able to dive for up to 10 minutes.’
- a. Taro-wa 10 pun mogut-TEI-re-ru.  
Taro-TOP 10 minutes dive-TEI-ABL-PRES  
‘Taro is able to dive for 10 minutes (since he has trained to do this.’ (= (139a))
- b. #Taro-wa 10 pun mogu-re-tei-ru.  
Taro-TOP 10 minutes dive-ABL-TEI-PRES  
‘Taro has been able to dive for 10 minutes.’ (= (139b))

Unlike (140a), the sentence in (140b) becomes anomalous under the given context. If *tei* in (140b) is an experiential *tei*, and if the experiential reading crucially presupposes the event to have occurred at some point in the past, the ill-formedness of the sentence in (140b) is accounted for.

That an experiential reading is obtained with the sequence *re-tei*, while a current reading is obtained with the sequence *tei-re* is supported by the tests which were presented above. First, in terms of compatibility with a past-adverbial, the sequence *re-tei* patterns with an experiential *tei* and the sequence *tei-re* patterns with the current situation *tei*. Like experiential *tei*, *re-tei* is compatible with a past-adverbial ‘last year’, as illustrated by the example in (141b). On the other hand, like a current situation *tei*, *tei-re* cannot co-occur with ‘last year’, as exemplified in (141a).

- (141) a. Mari-wa (\*kyonen) ikitsuginashi-de 100 meetoru-o  
Mari-TOP last.year breathe.without-MANNER 100 meters-ACC  
oyoi-dei-rare-ru.  
swim-TEI-ABL-PRES  
‘Mari is able to be swim 100 meters without breathing (\*last year).’
- b. Mari-wa kyonen ikitsuginashi-de 100 meetoru-o  
Mari-TOP last.year breathe.without-MANNER 100 meters-ACC  
oyog-e-tei-ru.  
swim-ABL-TEI-PRES  
‘Mari has an experience of managing to swim 100 meters without breathing last year.’

If *tei* in (141a) is an instance of current situation *tei*, the sentence is predicted to become grammatical with tense agreement. The predication is borne out. If the present tense *ru* is replaced with a past tense *ta*, the sentence in (141a) becomes perfectly grammatical under the progressive reading.

- (142) Mari-wa kyonen ikitsuginashi-de 100 meetoru-o oyoi-dei-rare-ta.  
 Mari-TOP last.year breathe.without-MANNER 100 meters-ACC swim-TEI-ABL-PAST  
 ‘Mari was able to be swim 100 meters without breathing last year.’

Thus the behavior of *tei-re* and *re-tei* patterns with the behavior of a current situation *tei* and the behavior of an experiential *tei* respectively.

Furthermore, the exhaustive *ga* test supports the same pattern. When the subject is marked by *ga*, the subject of the *re-tei* statement requires an exhaustive reading, whereas the subject of the *tei-re* statement requires a non-exhaustive reading, as the translation of the sentences may suggest in (143).

- (143) a. Taro-ga 10 pun mogut-TEI-re-ru.  
 Taro-NOM 10 minutes dive-TEI-ABL-PRES  
 ‘Taro is able to dive for 10 minutes.’  
 b. Taro-ga 10 pun mogu-re-tei-ru.  
 Taro-NOM 10 minutes dive-ABL-TEI-PRES  
 ‘Taro (and only Taro) has been able to dive for 10 minutes.’  
 (Taro and only Taro has the experience of being able to dive for 10 minutes.)

The coordination test supports the claim that (143a) requires a non-exhaustive reading whereas (143b) requires an exhaustive reading. Like the current situation *tei*, the coordinated subjects of the *tei-re* statement in (144a) may entail the sentence without one of the coordinates in (144b).

- (144) a. Mari-to Taro-ga 10 pun mogu-TEI-re-ru.  
 Mari-and Taro-NOM 10 minutes dive-TEI-ABL-PRES  
 ‘Mari and Taro are able to dive for 10 minutes.’  
 b. Mari-ga 10 pun mogu-TEI-re-ru.  
 Mari-NOM 10 minutes dive-TEI-ABL-PRES  
 ‘Mari is able to dive for 10 minutes.’

In contrast, the coordinated subjects of the *re-tei* statement in (145a) do not entail the sentence without one of the coordinates in (145b), indicating that the subjects in (145a) require an exhaustive reading.

- (145) a. Mari-to Taro-ga 10 pun mogu-re-tei-ru.  
 Mari-and Taro-NOM 10 minutes dive-ABL-TEI-PRES  
 ‘Mari and Taro (and only Mari and Taro) have able to dive for 10 minutes.’ (Mari and Taro and only Mari and Taro have the experience of being able to dive for 10 minutes.)  
 b. #Mari-ga 10 pun mogu-re-tei-ru.  
 Mari-NOM 10 minutes dive-ABL-TEI-PRES  
 ‘Mari and only Mari has been able to dive for 10 minutes.’

Thus the results of the coordination tests strongly indicate that an exhaustive reading is obtained with the *re-tei* statement while a non-exhaustive reading is obtained with the *tei-re* statement.

As a result of the two diagnostics performed above, *tei* in the *re-tei* statement and *teü* in the *tei-re* statement are argued to be an experiential *tei* and a current situation *tei* respectively. Since the experiential *tei* follows and current situation *tei* precedes *re* which manifests  $\text{Mod}_{Abl}$ , the aspectual functors manifested by each *tei* morpheme are assumed to be in the following structural positions in (146).

$$(146) \quad \mathbf{Asp}_{Exp} > \text{Mod}_{Abl} > \mathbf{Asp}_{Prog/Result}$$

### The Embedded *tei*

In Narrog's hierarchy, the aspect head which is associated with the result state may be generated in five different positions. The relevant part of Narrog's (2009) hierarchy from (121) is repeated in (147).

$$(147) \quad \text{Mod}_{DN1} > \text{Asp}_1 > \text{Mod}_{DN2} > \text{Asp}_2 > \text{Mod}_{Vol} > \text{Asp}_3 > \text{Mod}_{EV3} > \text{Asp}_4 > \text{Mod}_{Abl} > \text{Asp}_5$$

Of the five positions, I have argued that the lowest two Asp positions are in fact two different aspect heads:  $\text{Asp}_5$  is for the current situation aspect, while  $\text{Asp}_4$  is for the experiential aspect. In this subsection, I will argue that the remaining three positions for aspect head, i.e.  $\text{Asp}_1$ ,  $\text{Asp}_2$  and  $\text{Asp}_3$ , can be eliminated from the hierarchy all together. I propose that the aspect morpheme *tei* that follows modal markers, which corresponds to the *tei* that appears in  $\text{Asp}_1$ ,  $\text{Asp}_2$  and  $\text{Asp}_3$  in (147), is actually an instance of the current situation aspect which belongs to the matrix clause. Thus, in the propose analysis, the positions for the aspect morpheme *tei* are the one below the abilitative modal and the one above the abilitative modal, as schematized in (148).

$$(148) \quad \dots[\text{Asp}_{Exp} \ \mathbf{Asp}_{Exp} \ [\text{Mod}_{ABL} \ [\text{Asp}_{Result/Prog} \ \mathbf{Asp}_{Result/Prog} \ \dots]]]]$$

Narrog supports the positions,  $\text{Asp}_1$ ,  $\text{Asp}_2$  and  $\text{Asp}_3$ , based on the observation that the aspect morpheme *tei* can either precede or follow the evidential modal, the volitional modal and the deontic strong necessity modal. The examples in (149) show that aspect morpheme *tei* can precede or follow the deontic strong necessity modal *nakerebanaranai* 'must'.

- (149) a. Gozenchuu zutto terebi-o tsukeppanashini shi-*tei*-nakerebanaranai.  
morning through TV-ACC leave.on do-TEI<sub>4</sub>-must.PRES  
(Context: Taro monitors a TV program from 7 AM to 12 PM,  
and therefore)  
'(He) has to leave the TV on throughout the whole morning.'

- b. Gogo zutto terebi-o tsukeppanashini shi-nakerebanaranaku-nar-*tei*-ru.  
 afternoon through TV-ACC leave.on do-must-become-TEI<sub>5</sub>-PRES

(Context: Taro is used to leaving the TV on in his room whenever his parents quarrel. Recently, they been quarreling almost the whole afternoon, every day. Therefore)  
 ‘(He is) in a state of being obliged to leave the TV on throughout the whole afternoon.’

Thus the location of *tei* in terms of the modal functor in (149) is straightforwardly predicted in his analysis.

His analysis, however, cannot account for the distribution of *tei* in the following sentence (150). (150) illustrates that *tei* can appear simultaneously both below and above the deontic strong necessity modal *nakerebanaranai* ‘must’.

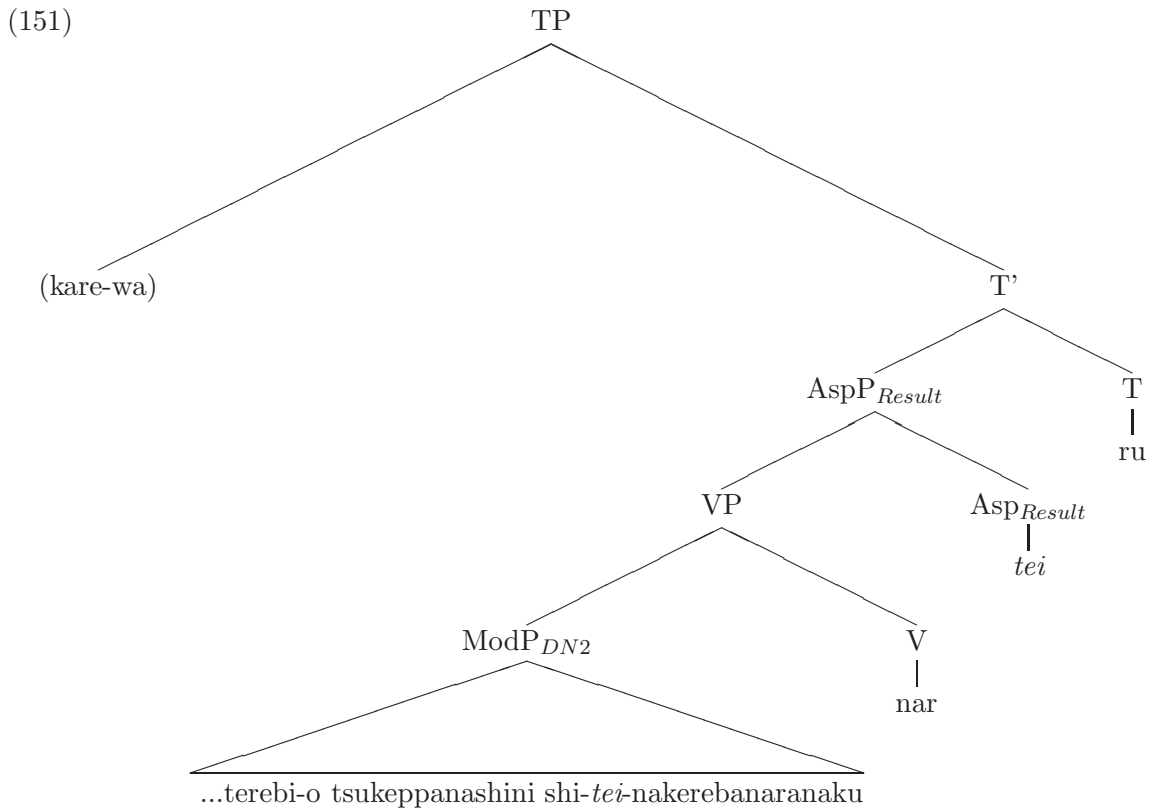
- (150) Ichinichizyuu zutto terebi-o tsukeppanashini shi-*tei*-nakerebanaranaku  
 all.day through TV-ACC leave.on do-TEI<sub>4</sub>-must  
 nar-*tei*-ru.

become-TEI<sub>5</sub>-PRES

(Context: Since Taro monitors a TV program in the morning and since his parents recently quarrel through the whole afternoon,)  
 ‘(He is) in a state of being obliged to leave the TV on all day long.’

In Narrog’s (2009) analysis, *tei* can appear either above or below a modal functor. His analysis therefore does not predict that the simultaneous occurrence of *tei* below and above ‘must’ is possible.

I argue that sentence (150) involves an embedding structure. More precisely, in (150), the verb *nar* ‘become’ takes the ModP<sub>DN2</sub> as a complement, making *tei*<sub>4</sub> part of an embedded clause. *Tei*<sub>5</sub>, on the other hand, belongs to the matrix clause, as schematized in (151).



The first indication that *tei*<sub>4</sub> is actually embedded in a complement clause as in (151) comes from the obligatory presence of the verb *nar* ‘become’. *Nar* ‘become’ must precede *tei* whenever *tei* follows the deontic strong necessity modal, the volitional modal or the evidential predicative modal. Omission of the verb *nar* turns the sentence ungrammatical, as illustrated in (152).

- (152) Ichinichizyuu zutto terebi-o tsukeppanashini shi-*tei*-nakerebanaranaku  
 all.day through TV-ACC leave.on do-TEI<sub>4</sub>-must  
 \*(*nar*)-*tei*-ru.  
 become-TEI<sub>5</sub>-PRES  
 ‘(He is) in a state of being obliged to leave the TV on all day long.’

This can be contrasted with the behavior of *tei* which cooccurs with the abilitative modal *rare*. Unlike the instances of *tei* following ‘must’ in (152), the *tei* following the abilitative modal *rare* cannot be split by the verb *nar* as in (153).

- (153) (Zenkai-no sensui-de) Taro-wa 10 pun mogu-re-(\**nar*)-*tei*-ru.  
 (previous diving-at) Taro-TOP 10 minutes dive-ABL-become-TEI-PRES  
 ‘(At the previous diving) Taro has come to be able to dive for 10 minutes.’



In my analysis, the contrast between (152) and (153) with respect to the availability of the verb *nar* can be straightforwardly explained. Under my proposal, there are only two positions for the morpheme *tei* in a single clause, right below and right above the abilitative ‘rare’, as schematized in (148). The position above ‘must’ is not a position for *tei*, therefore *tei* cannot immediately follow ‘must’. The only way to stack *tei* on top of ‘must’ is to start a new sequence of functional projections which contains *tei*, i.e. to have an embedded structure. Therefore, in (152), the presence of the verb *nar* ‘become’ is obligatory. On the other hand, in (153), *tei* can immediately follow the abilitative *rare*, since this is the right position for the experiential aspect marker. Assuming that the verb *nar* selects a complement which is larger than  $\text{ModP}_{\text{Abl}}$ , *nar* cannot immediately follow *rare*. Hence the presence of *nar* is not allowed in (153). Furthermore, if *nar* takes  $\text{ModP}_{\text{DN2}}$  as a complement clause, it explains the fact that the *tei*, following *nakerebanaranai* ‘must’, is obligatorily interpreted as a result state.

As presented in the previous section, *tei* unambiguously gives rise to a progressive reading when combined with a durative verb (roughly corresponding to an activity verb), while *tei* unambiguously yields a result state interpretation when combined with an instantaneous punctual verb (roughly corresponding to an achievement). My explanation is that since the verb *nar* is an instantaneous verb, the *tei* that combines with it yields a result state reading. In the next few paragraphs, I will demonstrate that *nar* is an instantaneous verb.

Achievement verbs are defined as denoting an event that has a definite endpoint but of a very short duration or of no duration at all (Tenny 1987). The verb *nar* describes that an entity undergoes a change of state. That the verb *nar* is an instantaneous verb is shown by an adverbial test taken from Shirai (2000). Adverbs like *sanzyuppun-de* ‘in 30 minutes’ and *sanzyuppun-go-ni* ‘after 30 minutes’ refer to the end and beginning point of an event, respectively. Therefore, with a verb like *wakas* ‘heat’ which denotes an event of a definite duration of some length, the sentence yields a different meaning depending on the use of the adverbial. For example, the sentence with ‘after 30 minutes’ in (154a) only refers to the beginning point of Ken’s heating event of the bath water, while the sentence with ‘in 30 minutes’ in (154b) only refers to the end point of the same event.

- (154) a. Ken-wa sanzyuppun-go-ni huro-o wakas-u.  
 Ken-TOP 30.minutes-after-TEMP bath-ACC boil-PRES  
 ‘Ken will heat the bath water after 30 minutes.’ (Shirai 2000: 340)
- b. Ken-wa sanzyuppun-de huro-o wakas-u.  
 Ken-TOP 30.minutes-in bath-ACC boil-PRES  
 ‘Ken will heat the bath water in 30 minutes.’

On the other hand, in both (155a) and (155b), the sentences with the instantaneous verb ‘leave’ express the same situation. They do not differ in meaning like sentences in (154a) and (154b).

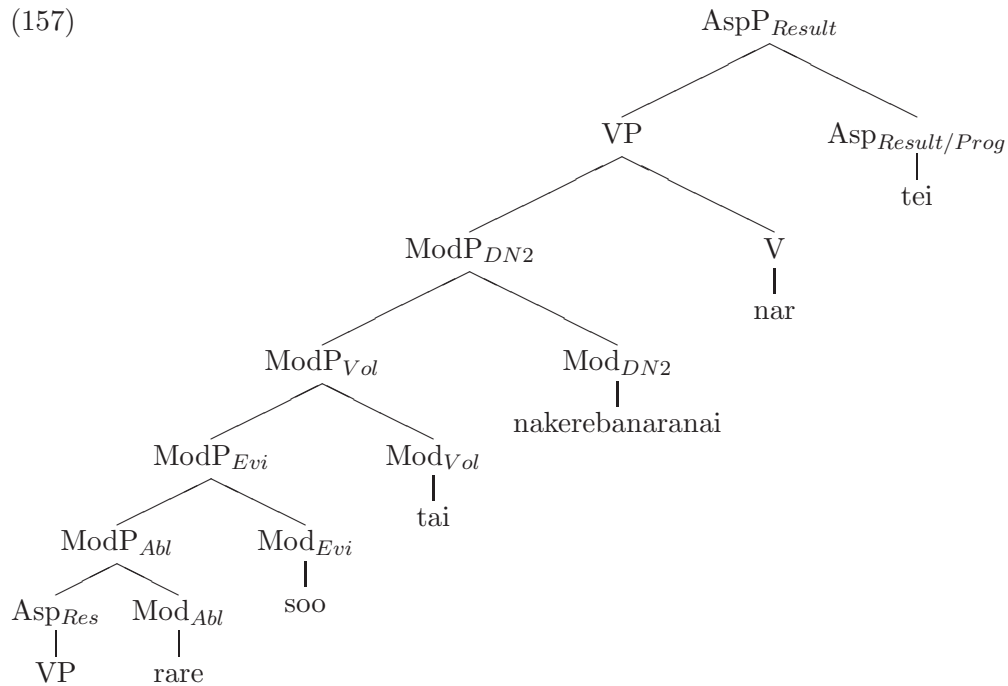
- (155) a. Ken-wa sanzyuppun-go-ni dekake-ru.  
 Ken-TOP 30.minutes-after-TEMP leave-PRES  
 ‘Ken will leave after 30 minutes.’ (Shirai 2000: 340)
- b. Ken-wa sanzyuppun-de dekake-ru.  
 Ken-TOP 30.minutes-in leave-pre  
 ‘Ken will leave in 30 minutes.’

Shirai (2000) points out that an instantaneous verb, since it is a punctual verb and lacks duration, yields the same meaning with either adverbial. The verb *nar* behaves like an instantaneous verb in terms of the adverbial test as in (156).

- (156) a. Heya-ga sanzyuppun-go-ni atataka-ku nar-u  
 room-NOM 30.minutes-after-TEMP warm-ADJ become-PRES  
 ‘The room will be warm after 30 minutes.’
- b. Heya-ga sanzyuppun-de atataka-ku nar-u  
 room-NOM 30.minutes-in warm-ADJ become-PRES  
 ‘The room will be warm in 30 minutes.’

If the verb *nar* ‘become’ contains duration like the verb ‘heat’ in (154a) and (154b), the adverbial phrases ‘after 30 minutes’ and ‘in 30 minutes’ must refer to the different points (i.e. the beginning point or the end point) of the event denoted by the verb. Unlike (154a) and (154b), however, the sentences in (156) do not give rise to the two separate readings. Rather, they describe the same situation where the room undergoes a change from a cold to a warm state, indicating that the verb *nar* is an instantaneous verb. Given that *nar* is an instantaneous verb, it necessarily gives rise to a result state reading when combined with *tei*.

Under the current proposal, the verb *nar* takes a deontic strong necessity modal phrase,  $\text{ModP}_{DN2}$ , as a complement, as schematized in (157).



If we assume the structure in (157), the following predictions arise: (i) it should be possible for the lower modals like the abilitative, evidential and volitional modals to embed the deontic strong necessity modal, and (ii) it should be possible for the deontic strong necessity modal to embed another deontic strong necessity modal. Both predictions are borne out. The examples in (158a) and (158b) show that either the predictive evidential modal *soo* or the volitional modal *tai* can embed the deontic strong necessity modal *nakerebanaranai* ‘must’ when *nar* ‘become’ is present.

- (158) a. Rainen kekkon-shi-<sub>[DN2 nakerebanaranaku]</sub>-\*(nar)-TEI-<sub>[Ev3 soo]</sub>-da.  
 next.year marry-do- must-become-TEI-  
 look-COPL  
 ‘Next year it seems that I will be in a state of being obliged to get married.’
- b. Rainen-ni-wa saishuu shiken-o uke-<sub>[DN2 nakerebanaranaku]</sub>  
 next.year-TEMP-TOP final exam-ACC take- must  
 \*(nar)-TEI-<sub>[Vol tai]</sub>.  
 become-TEI- want  
 ‘Next year I want to be in a state of being obliged to take the final exam.’

Similarly, the example in (159) shows that the deontic *nakerebanaranai* ‘must’ can embed another deontic *nakerebanaranai*, when *nar* ‘become’ is

present.

- (159) Ichigatsu-ni-wa ketsuron-o kak-<sub>[DN2]</sub> anakerebanaranaku]  
 January-TEMP-TOP conclusion-ACC write- must  
 \*(nar)-TEI-<sub>[DN2]</sub> nakerebanaranai].  
 become-TEI- must  
 ‘In January I must be in a state of being obliged to write a conclusion.’

Thus the current embedding analysis is superior to Narrog’s (2009) approach. Not only does it dispense with the multiple positions of the aspect head but also gives correct predications with respect to the modal doubling phenomenon, something which Narrog’s analysis cannot account for straightforwardly. In the next subsection, I will briefly mention an alternative approach for the multiple occurrences of the aspectual marker *tei*.

### An alternative approach: the Resultant *tei*

There is one more alternative to Narrog’s (2009) multiple occurrences of *tei* approach in (147), which I call the ‘single projection’ analysis. The single projection analysis assumes that there is a third aspect head which is associated with a resultant state,  $\text{Asp}_{\text{Resultant}}$ , in addition to the two Aspect heads,  $\text{Asp}_{\text{Exp}}$  and  $\text{Asp}_{\text{Result/Prog}}$ . Under this analysis, the morpheme *tei* manifests three different aspectual heads, as schematized in (160).

- (160)  $\text{Mod}_{DN1} > \mathbf{Asp}_{\text{Resultant}} \text{tei} > \text{nar}$  ‘become’  $> \text{Mod}_{DN2} > \text{Mod}_{Vol}$   
 $> \text{Mod}_{EV3} > \mathbf{Asp}_{\text{Exp}} \text{tei} > \text{Mod}_{Abl} > \mathbf{Asp}_{\text{Prog/Result}} \text{tei} > \text{Asp1}$

The single projection analysis assumes that  $\text{Asp}_{\text{Resultant}}$  is generated in between  $\text{Mod}_{DN1}$  and  $\text{Mod}_{DN2}$ . According to this analysis, therefore, the *tei* which follows the strong deontic necessity modal *nakerebanaranai* ‘must’, shown in (149b), is a manifestation of  $\text{Asp}_{\text{Resultant}}$ . The sentence in (149b) will therefore be given a structure as schematized in (161).

- (161) [<sub>TP</sub> Gogo zutto [<sub>AspPResultant</sub> [<sub>BecomeP</sub> [<sub>ModPDN1</sub> [<sub>VP</sub> terebi-o  
 afternoon through TV-ACC  
 tsukeppanashini shi] nakerebanaranaku] nar] *tei*] ru].  
 leave.on do must become TEI PRES  
 ‘(He is) in a state of being obliged to leave the TV on through the whole afternoon.’

The hierarchy in (160) is, in my opinion, still superior to Narrog’s hierarchy, since it reduces the five positions of *tei* to three positions, dispensing with the two positions for Aspect heads, one between  $\text{Mod}_{DN2}$  and  $\text{Mod}_{Vol}$ , and the other between  $\text{Mod}_{Vol}$  and  $\text{Mod}_{EV3}$ .

However, the single projection analysis cannot be the right approach to *tei* in Japanese due to the following three problems. The first problem is that the position of the verb *nar* ‘become’ is a stipulation. In the single projection analysis in (161), the verb *nar* is forced to occur in the position between the Asp head and the deontic strong necessity modal head in the modal domain. This is not a standard position for the verb to appear. Under the single projection analysis, one might claim that the *nar* that follows the deontic strong necessity modal is an instance of a dummy verb whose function is to support Tense like the dummy verb *su* ‘do’. (cf. the differences between the dummy verb *su* and the full verb/light verb *su* are discussed in Ivana and Sakai 2007).

- (162) Taro-ga marason-o hashiri-wa *shi-ta* ga, saigo made hashirikirenakatta.  
 Taro-NOM marathon-ACC run-TOP do-PAST but, last until run.finish.NEG.PAST  
 ‘Taro did run in the marathon, but could not run till the end.’  
 (Ivana and Sakai 2007: 174)

In (162), the main verb ‘run’ is present in the tenseless form followed by the topic marker, and the past tense is carried by the dummy verb *su*. The *nar* ‘become’ in question, however, is not a dummy verb like *su* in (162). Consider sentence (163). As in example (162), the verb *nar* is present in the tenseless form followed by a topic marker. Tense is manifested by the dummy verb *su*. Assuming that there can be only one tense marker in one clause, there should be only one dummy verb in (163).

- (163) Taro-ga marason-o hashir-anakerebanaranaku-*nari-wa shi-ta*  
 Taro-NOM marathon-ACC run-must-become-TOP do-PAST  
 ga...  
 but...  
 ‘Taro did become to be obliged to run in the marathon, but...’

I therefore reject the idea that *nar* in (163) is a dummy verb.

The second problem is that the two aspect heads in (163) are still redundant. In (163) the lowest Asp head is associated with either the progressive or the result state reading, while the highest Asp head is associated with the resultant state. It is not clear whether the *tei* that manifests the highest Asp and the *tei* which manifests the lowest Asp yield different result state readings. One possible solution to this is to associate the highest *tei* position with the resultant state reading and the lowest *tei* position with a target state reading in the sense of Kratzer (2000). In the literature, it is argued that there are two subtypes of result state which are found in stative passive constructions, ‘Target state’ and ‘Resultant state’ (Parsons 1990, Kratzer 2000). According to Parsons (1990), a target state reading expresses a state that is in principle reversible, and hence can be a transitory state, whereas a resultant state

expresses a state that is irreversible and hence has to hold for good. Given the two types of the state, in the single projection analysis, one might argue that there is a resultant state aspect head, an experiential aspect head and an aspect head for progressive and target state readings. These heads would appear in the following hierarchical order in (164).

- (164)  $\text{Mod}_{DN1} > \mathbf{Asp}_{Resultant} > \text{Mod}_{DN2} > \text{Mod}_{Vol} > \text{Mod}_{EV3} > \mathbf{Asp}_{Exp}$   
 $> \text{Mod}_{Abl} > \mathbf{Asp}_{Prog/Target} > \text{Asp1}$

Even if the redundancy between the highest Asp and the lowest Asp in terms of its reading would be solved, there is a major shortcoming with the single projection analysis. This analysis gives incorrect predictions with respect to the modal doubling phenomena. As I have presented in the previous section, it is possible to have two instances of the deontic modal ‘must’ in a sentence. A similar example with the volitional modal ‘want’ is given in (165). The examples in (165a) and (165b) show that the volitional *tai* can be embedded either under another *tai* or the deontic necessity *nakerebanaranai*, when the verb *nar* is present.

- (165) a. Sanzikan-go-ni-wa gohan-ga tabe-<sub>[Vol taku]</sub>-\*(nar)-tei-<sub>[EV3</sub>  
 3.hour-after-TEMP-TOP meal-NOM eat- want-become-TEI-  
 soo]-da.  
 seem-COPL  
 ‘(I ate very little this morning. Therefore) after three hours, it  
 seems that I will be in a state of desiring to have a meal.’
- b. Sanzyuu madeni-wa kekkon-shi-<sub>[Vol taku]</sub>-\*(nar)-tei-<sub>[Vol tai]</sub>.  
 30 by-TOP marry-do- want-become-TEI- want  
 ‘I want to be in a state of desiring to get married by the age of  
 thirty.’

Furthermore, I demonstrated that the lower modal like *soo* and *tai* can follow the higher modal *nakerebanaranai*. Under the single projection analysis, both phenomena, i.e. the doubling phenomena of the modal like ‘must’ and ‘want’, and the fact that the lower modal follows the higher modal, are predicted not to occur. Thus, I reject the single projection analysis.

This subsection has attempted to clarify the location of Aspectual marker *tei* in relation to Modal functors. Narrog’s (2009) study indicates that *tei* appears in five positions. I have argued that the five positions of *tei* can be reduced to two positions, each of which is associated with different readings, the experiential reading and the progressive/result state readings. In the next section, I will present the scope interaction between some of the modal functors and PPs which are observed to interact with the aspect marker *tei*.

## 4.5 Interaction between modals and PPs

In section 3, I showed that Temp and Loc may appear either above or below the aspectual head  $Asp_{Result/Prog}$ , while Com and Inst/Means must appear below  $Asp_{Result/Prog}$ . In section 4, I argued that the position of  $Asp_{Result/Prog}$  must be below  $Mod_{Abl}$ , which is the lowest modal in the modal hierarchy extracted from Narrog's (2009) study. Given these two results, the predictions that arise in terms of the distribution of PPs are that (i) Com and Inst/Means should not appear in the higher positions of the modal hierarchy, and (ii) Temp and Loc may appear in the higher positions of the modal hierarchy. In this subsection, based on the compositionality tests, I will demonstrate that both predictions are borne out. With respect to the prediction in (ii), I will show that the highest positions in which Temp and Loc may appear are the positions below and above the deontic strong necessity modal  $Mod_{DN2}$ , which is in the middle of the modal hierarchy. Next, I will examine the scope relations between the four PPs and the abilitative modal *rare* 'able', the volitional modal *tai* 'want', the deontic strong necessity modal *nakerebanaranai* 'must', and the deontic weak necessity modal *beki* 'should'.

### 4.5.1 Temporal

#### Abilitative modal *rare*

Consider the sentence with the abilitative modal *rare* in (166) and the two possible readings in (167).

(166) (Atarashii chiryoohoo-no okagede) Taro-wa [ $Temp$  12gatsu-ni]  
 (new treatment-GEN thanks.to) Taro-TOP December-TEMP  
 ato san nen-kan iki-rare-ru.  
 next three year-period live-ABL-PRES  
 '(Thanks to the new treatment) Taro can live for the next three years  
 in December.'

(167) a. [ [ $Temp$  in December ] [ Taro is able to live for the next three  
 years ] ]  
 b. [ Taro is able to [ live for the next three years [ $Temp$  in December  
 ] ] ]

Of the two readings schematized in (167), only the wide scope reading of the Temp PP 'in December' in (167a) should be available for sentence (166). The narrow scope reading of Temp, which is schematized in (167b), should be excluded by the context, since it is not possible to live for three years in a month. The sentence is fine under the scenario which is compatible with the reading in (167a): in November the remaining life of Taro is a month, but in December his remaining life is three years, thanks to a new and an effective

treatment. Thus, I infer that Temp can be outside the scope of  $\text{Mod}_{Abl}$ .

Let us now consider sentence (168). The sentence in (168) is fine under the following scenario: Taro has been sick and has not been exercising for a long time. Recently, his health has been improving due to a new treatment. Therefore, he will be able to start exercising in December. This scenario is compatible with the narrow scope reading of Temp, and not with the wide scope reading of Temp, in relation to the abilitative modal *rare*. Since the sentence is fine under this scenario, it is inferred that Temp can be lower than  $\text{Mod}_{Abl}$ .

- (168) (Atarashii chiryoo-hoo-no okagede) Taro-wa [ $T_{emp}$  12gatsu-ni]  
 (new treatment-GEN thanks.to) Taro-TOP December-TEMP  
 undooshi-hazime-rare-ru.  
 exercise.do-start-ABL-PRES  
 ‘(Thanks to the new treatment) Taro can start exercising in December.’ go-ABL-PRES

The above two data sets suggest therefore that Temp can be either higher or lower than  $\text{Modal}_{Abl}$ .

### Volitional modal *tai*

Consider sentence (169) with a Temp PP and the volitional morpheme *tai* under the two scenarios in (170).

- (169) Watashi-wa [ $T_{emp}$  getsuyoobi-ni] mensetsu-ga uke-takatta.  
 I-TOP Monday-TEMP interview-NOM receive-wanted  
 ‘I wanted to undergo an interview on Monday.’

- (170) Scenarios

Temp	Sunday	Monday	Tuesday
S1	dreaded interview	felt ready to undergo an interview on	Tuesday interview
S2	eager for inter- view on Monday	no longer wanted to be interviewed	

Scenario 1 in (170) is compatible with only the wide scope reading of Temp, whereas scenario 2 is compatible with only the narrow scope reading of Temp in relation to the volitional modal. Since the sentence is fine under either scenario, it is inferred that Temp can be either higher or lower than  $\text{Mod}_{Vol}$ .



**Deontic strong necessity modal *nakerebanaranai***

Consider the deontic strong necessity modal *nakerebanaranai* ‘must’ in sentence (171) under the following two scenarios. In both scenarios, Taro is a computer engineer and his job is to travel to the subsidiary companies to fix computer problems. The first scenario is where Taro is told by his boss on Sunday to go to the Seoul office on Monday, which is compatible with only the narrow scope reading of Temp over ‘must’. The second scenario goes as follows: on Monday Taro’s boss tells him to go to the Seoul office to fix their computer problem. Taro therefore books a plane ticket to Seoul for the following day. On Tuesday, however, the Seoul office reports that they have fixed the problem themselves, so Taro does not have to go to the Seoul office after all. This scenario is compatible with only the wide scope reading of Temp.

- (171) Taro-wa [<sub>Temp</sub> getsuyoobi-ni] shucchoo-shi-nakerebanaranakatta.  
 Taro-TOP Monday-TEMP business.trip-do-must  
 ‘Taro was obliged to go on a business trip on Monday.’

Since the sentence in (171) is fine under either scenario, it indicates that Temp can be either lower or higher than Mod<sub>DN2</sub>.

**Deontic weak necessity modal *beki***

Consider the sentence in (172) under two scenarios. Scenario 1 goes as follows: Influenza is prevalent now. Therefore, Taro should get vaccination on Monday, when they start performing the vaccinations. Scenario 2 goes as follows: On Monday, Taro’s parents told him that it is very important to get vaccinated in order to avoid the swine flu. On Tuesday, however, his parents told him not to get vaccinated, because they heard about many occurrences of harmful side effects. Taro went to get vaccinated on Tuesday anyway.

- (172) Taro-wa [<sub>Temp</sub> getsuyoobi-ni] yoboosesshu-o uke-ru-beki-datta.  
 Taro-TOP Monday-TEMP vaccination-ACC receive-PRES-should-COPL.PAST  
 ‘Taro was mildly obliged to get vaccinated on Monday.’

The sentence in (172) is fine under scenario 1, which is compatible with either reading of Temp in relation to the weak necessity modal. On the other hand, the sentence is anomalous under scenario 2, which I believe to be compatible with only the wide scope reading of Temp. I therefore infer that Temp must be lower than Mod<sub>DN1</sub>.

## 4.5.2 Locative

### Abilitative modal *rare*

Consider sentence (173). It should be compatible with the wide scope reading of Loc in (174a) and not with the narrow scope reading in (174b). The narrow scope reading is excluded by context since it is not possible to return to the earth on the moon.

- (173) Sono roketto-wa tsuki-de chikyuu-ni kikan-dekiru.  
 that rocket-TOP moon-LOC earth-GOAL return-do.ABL.PRES  
 ‘That rocket can return to the earth on the moon.’
- (174) a. [[*Loc* on the moon] [ the rocket is able to return to the earth ]]  
 b. [the rocket is able to [return to the earth [*Loc* on the moon ]]]

The sentence in (173) is fine under the scenario: On Earth, the rocket is not able to launch because of the dense atmosphere and high gravity. On the moon, however, the rocket is able to launch and return to Earth because of low gravity. It is therefore inferred that Loc can be higher than Mod<sub>Abl</sub>.

Consider sentence (175). It is fine under the following scenario: Taro is in Japan and training hard. Since he is well-trained, he is able to swim in the very cold waters of the Arctic Ocean. This scenario is compatible with only the narrow scope reading of Loc in relation to the abilitative modal. I therefore infer that Loc can be lower than Mod<sub>Abl</sub>.

- (175) Taro-wa [*Loc* hokkyokukai-de] oyog-e-ru.  
 Taro-TOP Arctic.Ocean-LOC swim-ABL-PRES  
 ‘Taro can swim in the Arctic Ocean.’

The above two data sets indicate that Loc can be either above or below Mod<sub>Abl</sub>.

### Volitional modal *tai*

Consider the sentence with the volitional modal *tai* and a Loc PP. Of the two possible readings, the narrow scope reading of the Loc PP should not be available in (176). There is no sea in the Sahara Desert, and accordingly the Loc PP ‘in the Sahara Desert’ cannot modify the VP ‘have a bath in the sea’ because of the interpretation clash.

- (176) Watashi-wa [*Loc* Sahara-sabaku-de] tamaranaku kaisuiyoku-ga  
 I-TOP Sahara-LOC unbearably sea.bathing-NOM  
 shi-takatta.  
 do-wanted  
 ‘I could not help having a desire to bathe in the sea in the Sahara.’

Sentence (176) is fine under the scenario where, while in the Sahara, I desire to bathe in the sea of Japan. This is compatible with the wide scope reading of the Loc PP. Loc PP is therefore inferred to be higher than  $\text{Mod}_{Vol}$  in (176).

The sentence in (177) potentially gives rise to ambiguity in terms of scope of the Loc PP in relation to ‘want’. The context ‘I was in Norway on a business trip’, however, should eliminate the wide scope reading of the Loc PP. The grammaticality of the sentence in (176) demonstrates that the narrow scope reading of Loc PP is available in (177).

- (177) (Watashi-wa shuchoo-de Noruee-ni iru toki-ni,) tamaranaku  
 I-TOP business.trip-LOC Norway-LOC stay time-TEMP, unbearably  
 Tokyo-no sushiya-de sushi-ga tabe-takatta.  
 Tokyo-GEN sushi.restaurant-LOC sushi-NOM eat-wanted  
 ‘(When I was in Norway on a business trip,) I could not help having  
 a desire to eat sushi at a sushi restaurant in Tokyo.’

The data sets suggest that Loc can appear either above or below  $\text{Mod}_{Vol}$ .

### Deontic strong necessity *nakerebanaranai*

The example in (178) should contain only the wide scope reading of the Loc PP in relation to the deontic modal *nakerebanaranai* ‘must’. The narrow scope reading, in which the Loc PP modifies the tying event and not the obligation to do so, contradicts the sentence ‘therefore Taro tied his dog at home before he came to the park.’ The narrow scope reading of Loc PP, therefore, is eliminated in (178). That the sentence in (178) is well-formed indicates that Loc is outside the scope of the deontic strong necessity modal.

- (178) (Shi-no kisoku-dewa) kooen-de inu-o roopu-ni tsunag-anakerebanaranai(-node,  
 city-GEN rule-according.to park-LOC dog-ACC rope-to tie-must-because,  
 Taro-wa arakazime ie-de inu-o tsunai-de kita).  
 Taro-TOP in.advance home-LOC dog-ACC tie-TEI came  
 ‘(According to the rules of the city) one must tie a dog in the park,  
 (therefore Taro tied his dog at home before he came to the park).’

Consider the sentence in (179). This sentence is fine under the following scenario: When Taro went to the library it was closed. He therefore was obliged to read in the park next to the library. Since this reading is compatible with the narrow scope reading of Loc in relation to the deontic strong necessity modal, it indicates that Loc may be in the scope of  $\text{Mod}_{DN2}$ .

- (179) Kooen-de hon-o yom-anakerebanaranakatta.  
 park-LOC book-ACC read-must.PAST  
 ‘(I) was obliged to read a book in the park.’

These facts indicate that *Loc* can be either above or below  $\text{Mod}_{DN2}$ .

### Deontic weak necessity modal *beki*

Consider a *Loc* PP in relation to the deontic weak necessity modal ‘should’ in (180).

- (180) Kooen-de bebiishittaa-o tsukau-beki da.  
 park-LOC babysitter-ACC use-should COPL  
 ‘(Taro) should use a babysitter in the park.’

There are two scenarios to consider. Scenario 1 goes as follows: Taro leaves his child unattended at home while he is in the park, which is right next to his house. He thinks that he will hear the child if something happens at home. However, he really should have a baby sitter at home when he is in the park. This scenario is compatible with only the wide scope reading of *Temp* in relation to ‘should’. Scenario 2 goes as follows: Taro goes to the park with his child everyday. When they are in the park, Taro is usually very busy with talking to other parents, leaving his child unattended. He should really use a baby sitter in the park. This scenario is compatible with either reading. The sentence is fine under scenario 2, but it is anomalous under scenario 1. I therefore infer that *Loc* must be lower than  $\text{Mod}_{DN1}$ .

### 4.5.3 Comitative

#### Abilitative modal *rare*

Consider a *Com* PP in relation to the abilitative *rare* under two scenarios. Scenario 1 goes as follows: Hanako is scared of water. However, with her hero Taro waiting for her on shore, Hanako is able to dive (alone). In other words, Hanako is not able to dive without Taro’s presence on shore. This is compatible with only the wide scope reading of *Com* PP. Scenario 2 goes as follows: Hanako usually dives alone. Today, however, she is asked to teach Taro who is new to diving. Fortunately, she is free today so she can dive with Taro. This scenario is compatible with narrow scope of *Com*.

- (181) Hanako-wa Taro-to umi-ni mogur-e-ru.  
 Hanako-TOP Taro-COM sea-GOAL dive-ABL-PRES  
 ‘Hanako can dive in the sea with Taro.’

Since the sentence is fine under scenario 2 but not under scenario 1, I infer that *Com* must be lower than  $\text{Mod}_{Abi}$ .

**Volitional modal *tai***

Consider the sentence in (182) under two scenarios. The first scenario goes as follows: Taro has such a good influence on me. When he is around, even though he is doing nothing, I have a desire to study. This scenario is compatible with only the wide scope reading of Com PP. The second scenario is where I have a desire to study, but together with Taro. This scenario, on the other hand, is compatible with only the narrow scope reading of the Com PP.

- (182) Watashi-wa Taro-to benkyoo-ga shi-takatta.  
 I-TOP Taro-COM study-NOM do-wanted  
 ‘I wanted to study with Taro.’

That the sentence is fine under the second scenario but it is anomalous under the first scenario indicates that Com must be lower than  $\text{Mod}_{Vol}$ .

**Deontic strong necessity *nakerebanaranai***

Sentence (183) is fine under the scenario where I want to study together with the teacher. On the other hand, the sentence is anomalous under the following scenario: The teacher has authority over his students. When he is standing in front of me, I am obliged to study.

- (183) Watashi-wa sensei-to benkyoo-o shi-nakerebanaranai.  
 I-TOP teacher-COM study-ACC do-must.PRES  
 ‘I must study with the teacher.’

The first scenario is compatible with only the narrow scope reading of Com PP while the second scenario is compatible with only the wide scope reading. The fact that the sentence is fine under the first scenario but not the second indicates that Com must be lower than  $\text{Mod}_{DN2}$ .

**Deontic weak necessity *beki***

Consider the sentence in (184) under two scenarios. The first scenario is where I feel mildly obliged to study together with the teacher. The second scenario is as follows: Our teacher is good at making us feel guilty when we don’t study. When he is around, therefore, I feel mildly obliged to study.

- (184) Watashi-wa sensei-to benkyoo-o su-ru-beki-da.  
 I-TOP teacher-COM study-ACC do-PRES-should-COPL  
 ‘I should study with the teacher.’

The sentence is fine under the first scenario which is compatible with only the narrow scope reading of Com. The sentence is unaccepted, however, under

the second scenario, which is compatible with only the wide scope reading of Com. I therefore infer that Com must be lower than  $\text{Mod}_{DN1}$ .

#### 4.5.4 Instrumental/Means

##### Abilitative *rare*

Example (185) should be compatible with the wide scope reading of the Means PP ‘by means of a drug’ in (186a) and not with the narrow scope reading of the Means PP in (186b). The narrow scope reading of the sentence should be excluded contextually, since it is not possible to perform a ski jump by means of a drug.

- (185) ??Taro-wa kusuri-de 120 meetoru tob-e-ru.  
 Taro-TOP drug-means 120 meters fly-ABL-PRES  
 ‘(Taro is a ski jumper.) Taro is able to fly 120 meters by means of an illegal drug.’
- (186) a. [Taro is able to [fly 120 meters [*Means* by means of an illegal drug]]]  
 b. [ [*Means* by means of an illegal drug] Taro is able to [fly 120 meters]]

The unacceptability of the sentence in (185) suggests that Inst/Means does not take wide scope in relation to  $\text{Mod}_{Abl}$ .

The sentence in (187) indicates that the narrow reading of Inst in relation to an abilitative modal is fine. The sentence is fine under the scenario where Taro is able to make a drawing with pastels. This scenario is compatible with the narrow scope reading of Inst in relation to the abilitative modal.

- (187) Taro-ga pasuteru-de e-o kak-e-ru.  
 Taro-NOM pastel-INST picture-ACC draw-ABL-PRES  
 ‘Taro can draw a picture with pastels.’

Thus I infer that Inst/Means must be lower than  $\text{Mod}_{Abl}$ .

##### Volitional *tai*

Consider sentence (188). The sentence is fine under the scenario where I have a desire to fly a hang glider. This scenario is compatible with the narrow scope reading of Inst in relation to the volitional modal, indicating that Inst may take narrow scope in relation to *tai* ‘want’.

- (188) Watashi-wa hanguraidaa-de sora-o tobi-tai.  
 I-TOP hang.glider-means sky-ACC fly-want  
 ‘I want to fly a hang glider.’

Consider now the sentence in (189) under the following two scenarios. The first scenario is where I have a desire to eat a meal using a hang glider as an Inst. However, it does not make sense to eat a meal with a hang glider, and thus this scenario is contextually excluded. The second scenario goes as follows: When I fly with a hang glider, I always get very hungry and have a desire to eat a meal. I believe that this scenario is only compatible with the wide scope reading of Inst in relation to the volitional modal.

- (189) #Watashi-wa hanguraidaa-de gohan-ga tabe-tai.  
 I-TOP hang.glider-means meal-NOM eat-want.  
 ‘I want to eat a meal with a hang glider.’

The fact that the sentence is anomalous under this scenario indicates that Inst must be lower than  $\text{Mod}_{Vol}$ .

### Deontic strong necessity *nakerebanaranai*

Consider the sentence under the scenario which goes as follows: Among the various diet methods, Mary’s doctor strongly believes that the power yoga diet is the only method which works. Therefore, as the doctor strongly recommends, Mary is obliged to reduce her weight using the power yoga diet method. This scenario is compatible with only the narrow scope reading of Inst/Means. Since the sentence is fine under this scenario, I infer that Inst/Means can be lower than  $\text{Mod}_{DN2}$ .

- (190) Mary-wa pawaayoga daietto-hoo-de yase-nakerebanaranai.  
 Mary-TOP power.yoga diet-methods-means lose.weight-must.PRES  
 ‘Mary must lose weight by means of the power yoga diet.’

Consider a similar sentence in (191) under a different scenario. The scenario to consider goes as follows: When Mary practices power yoga, she gets very tired and must take a rest. This scenario is compatible with the wide scope reading of Inst/Means in relation to the deontic necessity modal.

- (191) #Mary-wa pawaayoga-de kyuukeeshi-nakerebanaranai.  
 Mary-TOP power.yoga-means rest-must.PRES  
 ‘Mary must take a rest by means of a power yoga.’

Since the sentence is anomalous under this scenario, it can be concluded that Inst/Means must be lower than  $\text{Mod}_{DN2}$ .

### Deontic weak necessity *beki*

Consider example (192) under the following scenario: Mary’s coach knows many different diet methods. He considers the methods focusing on physical exercises to be the most natural way to reduce one’s weight. Therefore, he

recommends that Mary reduce her weight by means of the power yoga diet. This scenario is compatible with only a narrow scope reading of Inst/Means. Since the sentence is fine under this scenario, it is inferred that Inst/Means can be lower than  $\text{Mod}_{DN1}$ .

- (192) Mary-wa pawaayoga daietto-hoo-de yase-ru-beki-da.  
 Mary-TOP power.yoga diet-methods-means loos.weight-PRES-should-COPL  
 ‘Mary should lose weight by means of the power yoga diet.’

Consider the sentence in (193) under the following scenario: Power yoga is very exhausting. It is therefore recommended that Mary take a rest when practicing power yoga. This scenario is compatible with wide scope of Inst/Means in relation to the deontic weak necessity modal. That the sentence is not acceptable under the scenario described above indicates that Inst/Means must be lower than  $\text{Mod}_{DN1}$ .

- (193) #Mary-wa pawaayoga-de kyuukeesu-ru-beki-da.  
 Mary-TOP power.yoga-means rest-should-COPL.PRES  
 ‘Mary should take a rest by means of power yoga.’

The results of the compositionality tests are presented in table (194).

(194)

	Temp	Loc	Com	Inst/Means
SHOULD	*T>S, S>T	*L>S, S>L	*C>S, S>C	*I>S, S>I
MUST	T>M, M>T	L>M, M>L	*C>M, M>C	*I>M, M>I
VOL	T>V, V>T	L>V, V>L	*C>V, V>C	*I>V, V>I
ABL	T>A, A>T	L>A, A>L	*C>A, A>C	*I>A, A>I

Both Com and Inst/Means allow a narrow scope reading but not a wide scope reading in relation to all the four modals. Thus, the prediction that Com and Inst/Means do not appear above  $\text{Mod}_{Abl}$  is confirmed. Furthermore, the results show that both Temp and Loc can be outside the scope of  $\text{Mod}_{Abl}$ ,  $\text{Mod}_{Vol}$  and  $\text{Mod}_{DN2}$ . The prediction that Temp and Loc appear in the higher positions of the modal hierarchy is also confirmed. From the results of the tests, the following positions for the PPs, with respect to the modal hierarchy, are proposed.

- (195)  $\text{Mod}_{DN1} > \mathbf{Temp} > \mathbf{Loc} > \text{Mod}_{DN2} > \mathbf{Temp} > \mathbf{Loc} > \text{Mod}_{Vol} > \mathbf{Temp} > \mathbf{Loc} > \text{Mod}_{Abl} > \mathbf{Temp} > \mathbf{Loc} > \mathbf{Com} > \mathbf{Inst/Means}$

## 4.6 Summary

This chapter attempts to map individual PPs onto the aspect and modal domain on the basis of scope facts. Based on the results of the compositionality



tests in this chapter, I propose the following positions for the PPs with respect to the modal and aspect markers (196).

- (196)  $\text{Mod}_{DN1} > \mathbf{Temp} > \mathbf{Loc} > \text{Mod}_{DN2} > \mathbf{Temp} > \mathbf{Loc} > \text{Mod}_{Vol} > (\text{Asp}_{Exp}) > \mathbf{Temp} > \mathbf{Loc} > (\text{Asp}_{Exp}) > \text{Mod}_{Abl} > \mathbf{Temp} > \mathbf{Loc} > \text{Asp}_{Result/Prog} > \text{Asp}_{1\_start/continue} > \mathbf{Temp} > \mathbf{Loc} > \mathbf{Com} > \mathbf{Reason} > \mathbf{Source} > \mathbf{Goal} > \mathbf{Inst/Means} > \text{Asp}_{2\_complete/continue} > \mathbf{Loc} > \mathbf{Com} > \mathbf{Source} > \mathbf{Goal} > \mathbf{Inst/Means} > \mathbf{Material} > \mathbf{Manner}$

The results of the compositionality tests indicate that the two highest PPs, Temp and Loc, can appear in several positions between the lowest Asp head and the middle high modal head  $\text{Mod}_{DN1}$ . The two lowest PPs, Material and Manner, on the other hand, must stay in the positions below the lowest Asp head. The remaining PPs have more mobility than the two lowest PPs, but they still have to stay in the Aspect domain. In the next chapter, I will outline a possible analysis for the distribution of the PPs observed in this chapter.



# Chapter 5

## Conclusion

### 5.1 Towards a possible analysis

This short chapter presents an outline of a possible analysis for the findings from the previous chapters. Then, in conclusion, the adopted analysis will be briefly compared to the previous analyses discussed in Chapter 2.

#### 5.1.1 Movement analysis

If all the results of the compositionality tests in the previous chapter are combined, the positions of the PPs with respect to modal and aspect markers can be represented as in (1). (An account for the positional facts of the PPs represented in (1) will be presented later in this section.)

- (1) ...Mod<sub>DN1</sub> > **Temp** > **Loc** > Mod<sub>DN2</sub> > **Temp** > **Loc** > Mod<sub>Vol</sub> > **Temp** > **Loc** > Mod<sub>Abl</sub> > **Temp** > **Loc** > Asp<sub>Result/Prog</sub> > Asp1 > **Temp** > **Loc** > **Com** > **Reason** > **Source<sub>C</sub>** > **Goal** > **Inst/Means** > Asp2 > **Loc** > **Com** > **Source<sub>C</sub>** > **Goal** > **Inst/Means** > **Material** > **Manner**...

Descriptively speaking, PPs can be divided into three groups, *A*, *B* and *C*, on the basis of their distributional properties in the hierarchy in (1). The classification of PPs is given in (2).<sup>1</sup>

- (2) a. [Group A: ] Material and Manner must occur in the low domain *A*.  
b. [Group B: ] Com, Reason, Source<sub>C</sub>, Goal, and Inst/Means must be in the intermediate domain *B*.  
c. [Group C: ] Temp and Loc can appear in the high domain *C*.

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<sup>1</sup>(2) is a revised classification of the one discussed in Chapter 4 102.

The distributional properties summarized in (1) and (2) call for at least three questions in (3).

- (3)
- a. How are the positions of the PPs in (1) derived?
  - b. Why are the PPs grouped into the three different domains in (2)?
  - c. Why can the PPs appear relatively freely among the functional head in their domain?

With regard to the question in (3a), there are at least three ways to account for the derivation of the PPs. The first approach, a base-generation analysis, is to assume that the multiple positions of the PPs in (1) are base-generated. The second approach, a head-movement analysis, is to assume that PPs are base-generated in unique positions. The multiple positions for the PPs are then created by scope movement of modal and aspect heads across the rigidly ordered PPs. The third approach, a PP movement analysis, is to assume that PPs are generated in unique positions and move across rigidly ordered modal and aspect heads.

In this thesis, I argue for the third approach and propose that the PPs can undergo scope movement within the domain which they belong to. Before presenting details of my analysis, I will demonstrate that the other two approaches, the base-generation analysis and the head-movement analysis due to their respective shortcomings. Let us consider how the distribution of Temp and Loc, for example, can be explained under the first two approaches.

In the base-generation analysis, Temp and Loc are base-generated in multiple positions between modal and aspect functors, as schematized in (4).

- (4) The base-generation analysis  

$$[\text{Mod}_{DN1}[\mathbf{Temp1}[\mathbf{Loc1}[\text{Mod}_{DN2}[\mathbf{Temp2}[\mathbf{Loc2}[\text{Mod}_{Vol}[\mathbf{Temp3}[\mathbf{Loc3}... [\text{Asp1}[\mathbf{Temp}_n[\mathbf{Loc}_n[\text{Asp2} \dots ]]]]]]]]]]]]]]]]$$

This approach can be immediately eliminated. The analysis has no clear reasons to prohibit the multiple occurrences of Temp and Loc, and hence overgenerates a sentence with multiple appearances of these PPs. For example, this analysis predicts that the aspect verb ‘continue’ and the volitional modal marker *tai* ‘want’ can each cooccur with a modifying Loc PP in the same clause. This is wrong.

Consider first example in (5), where a Loc PP modifies *tai* ‘want’.

- (5) Watashi-wa [<sub>Loc</sub> byooshitsu-de] dooshiyoomonaku chookyori marason-ga  
 I-TOP sick.room-LOC unbearably long.distance marathon-NOM  
 hashiri-takatta.  
 run-want.PAST  
 ‘(When I was in the hospital) I wanted to run a long distance marathon  
 unbearably in the sick room.’

The Loc PP ‘in the sick room’ is assumed to unambiguously modify the volition. Loc PP’s modification of the event of running a long distance is excluded due to interpretational clash.

On the other hand, a Loc PP can modify the initiation manifested by *das* in the example in (6).

- (6)    *Watashi-wa* [<sub>Loc</sub> *guraundo-de*] *chookyori*    *marason-o*    *hashiri-dashita*.  
          I-TOP                    ground-LOC    long.distance marathon-ACC run-start.PAST  
          ‘I started running a long distance marathon on the (sports) ground.’

Consider now the sentence in (7). On the basis of the example in (5) and (6), I assume that the Loc PP ‘in the sick room’ and ‘on the ground’ in (7) modify the volition and the initiation, respectively. Contrary to the prediction given by the base-generation approach, such a sentence is anomalous.

- (7)    \**Watashi-wa* [<sub>Loc</sub> *byooshitsu-de*] [<sub>Loc</sub> *guraundo-de*] *chookyori*    *marason-o*  
          I-TOP                    sick.room-LOC    ground-LOC    long.distance marathon-ACC  
          *hashiri-dashi-takatta*.  
          run-start-want.PAST  
          ‘I wanted to started running a long distance marathon on ground in  
          the sickroom.’

The intended meaning of the sentence in (7) is something like ‘When I was in the sick room I had a desire to start running along distance marathon on the sports ground’. As far as I can see, there is no meaning clash between the Loc PP and the Aspect verb ‘start’ or between the Loc PP and the modal ‘want’. The unacceptability of the sentence (7), therefore, seems to be syntactic in nature, not semantic.

Let us now consider the head-movement analysis. In this analysis, Temp and Loc are base-generated in the modal domain, and modal and aspect heads optionally move across Temp and Loc, changing the scope relations between PPs and modal or aspect operators. (8) represents the base-structure of modal and aspect heads, where Temp and Loc are generated between  $\text{Mod}_{DN1}$  and  $\text{Mod}_{DN2}$ .

- (8)    The head movement analysis  
          [ $\text{Mod}_{DN1}$  [**Temp** [**Loc** [ $\text{Mod}_{DN2}$  [ $\text{Mod}_{Vol}$  ... [ $\text{Asp}_{Result/Prog}$  [ $\text{Asp1}$   
          [ $\text{Asp2}$  ... ]]]]]]]]]]]

The head-movement analysis contains at least two problems. In this analysis, movement of the heads would yield the so-called ‘Bobaljik’s Paradox’ (Bobaljik 1999) in which the crossing of head positions is inevitable to derive the right word order (cf. A similar problem is discussed independently in Svenonius 2002).

Bobaljik's Paradox comes from his argument against Cinque's (1999, 2006) analysis of an adverb order which assumes that the  $H_{Participle}$ -Adv1-Adv2 order is derived by head movement of the participle across the two rigidly ordered adverbs. What Bobaljik argues is that in order to derive the  $H_{Aux}$ - $H_{Participle}$ -Adv order (in which the order between Aux and Participle is fixed), one has to make either of the following assumptions: (i) an adverb must move across the heads, giving rise to a paradox, or (ii) the heads move across the Adv, violating locality constraints due to crossing paths.

In what follows, I demonstrate that under the head movement analysis, derivation of the configuration  $\text{Mod}_{DN2} > \text{Asp}_{\text{Result/Prog}} > \text{Loc}$ , where *Loc* is in the scope of both  $\text{Mod}_{DN2}$  and  $\text{Asp}_{\text{Result/Prog}}$ , would yield Bobaljik's Paradox. Before discussing this, let me confirm scope relations in this configuration.

Consider first the scope relations between *Loc* and  $\text{Asp}_{\text{Result/Prog}}$  in (9). The sentence in (9) is fine under the scenario where Taro did homework at home and therefore is in a state of completing his homework wherever he is now. This scenario is compatible only with the narrow scope reading of *Loc* in relation to the result state. The sentence, on the other hand, is anomalous under the scenario where Taro did homework at school and, at home, is in a state of having completed his homework. This scenario is compatible only with the wide scope reading of *Loc*.

- (9) Taro-wa [*Loc* ie-de] shukudai-o shi-oe-TEI-ru.  
 Taro-TOP home-LOC homework-ACC do-complete-TEI-PRES  
 'Taro has finished his homework at home.'

Thus, the scope facts indicate that, in sentence in (9), *Loc* must be in the scope of  $\text{Asp}_{\text{Result/Prog}}$  and therefore, it must be lower than  $\text{Asp}_{\text{Result/Prog}}$ .

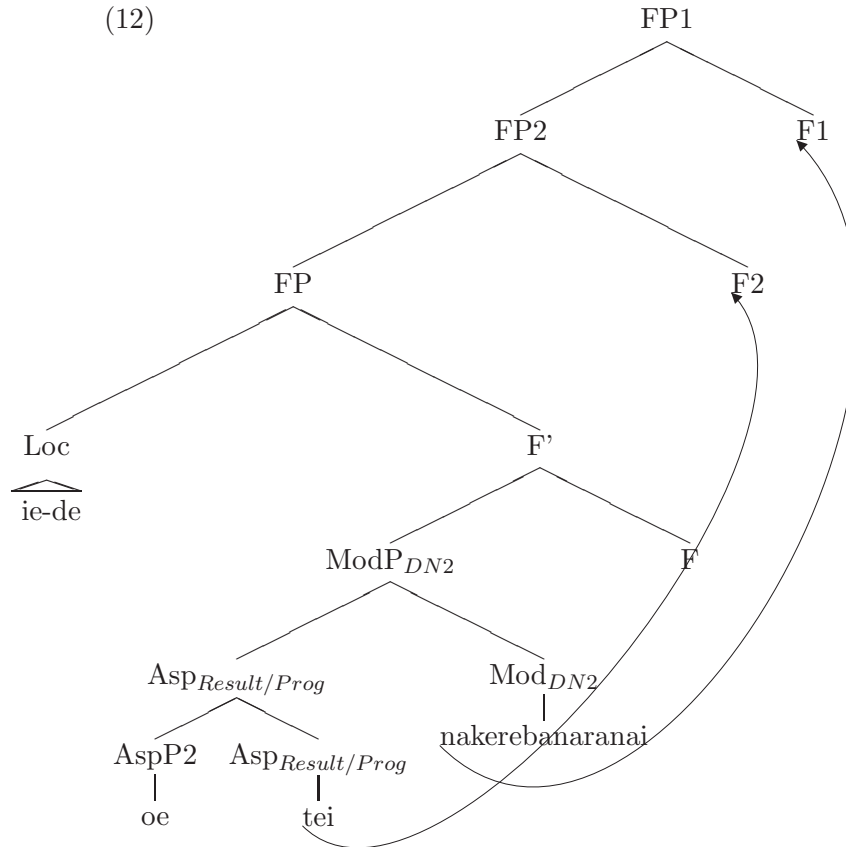
Consider now the scope relations between *Loc* and  $\text{Mod}_{DN2}$  in (10). The sentence is fine under the scenario where, at school, Taro was told by his teacher to finish his homework at home. Since this scenario is only compatible with a narrow scope reading of *Loc* in relation to 'must', *Loc* is inferred to be lower than 'must' in example (10).

- (10) Taro-wa [*Loc* ie-de] shukudai-o shi-oe-nakerebanaranai.  
 Taro-TOP home-LOC homework-ACC do-complete-must  
 'Taro must finish his homework at home.'

From the two examples in (10) and (9), I infer that in sentence (11), *Loc* is below both the result state and 'must'.

- (11) Taro-wa [*Loc* ie-de] shukudai-o shi-oe-tei-nakerebanaranai.  
 Taro-TOP home-LOC homework-ACC do-complete-TEI-must  
 'Taro is obliged to be in a state of completing his homework at home.'

In the head movement analysis, the derivation of sentence (11) would be schematized as in (12) ((12) shows only a relevant part of the derivation).



In order to derive the right structure,  $\text{Mod}_{DN2}$  must move to the higher position F1 and  $\text{Asp}_{Result/Prog}$  must move to the lower position F2. The movement of  $\text{Asp}_{Result/Prog}$  to F2, however, crosses the closest head position  $\text{Mod}_{DN2}$ . Thus, this movement violates strict locality constraints. In order to avoid crossing paths, one would have to assume that Loc PP moves across  $\text{Mod}_{DN2}$  and  $\text{Asp}_{Result/Prog}$ , giving rise to a paradox.

Furthermore, if heads undergo movement, it suggests that in (12),  $\text{Asp}_{Result/Prog}$  can move across  $\text{Mod}_{DN2}$ . Given that this movement changes the scope relations, one may predict that  $\text{Asp}_{Result/Prog}$  could scope over  $\text{Mod}_{DN2}$  when  $\text{Mod}_{DN2}$  does not move. This prediction, however, is not borne out. As I demonstrated in chapter 4, for independent reasons,  $\text{Asp}_{Result/Prog}$  cannot appear above  $\text{Mod}_{DN2}$  in a single clause. Due to the aforementioned theoretical problems, the head movement analysis in (8) is rejected. By elimination, the PP movement analysis, which I will lay out below in (13), is the optimal one.

The PP movement analysis does not suffer from the aforementioned problems. First, it can give a straightforward account for the ban on multiple appearances of the same types of PPs. In the PP movement analysis, there is one unique position for each PP type in a clause. The same PP type, therefore, cannot appear in more than one position in a single clause.

Second, the PP movement analysis is free from the theoretical problems that the head-movement analysis contains. It can account for the scope facts represented by the configuration  $\text{Mod}_{DN2} > \text{Asp}_{\text{Result/Prog}} > \text{Loc}$  in (11). In the PP movement analysis, this configuration can be derived by a cyclic movement of the Loc PP to a specifier position below  $\text{Asp}_{\text{Result/Prog}}$ . This movement does not violate locality constraints and hence the derivation does not induce the Bobaljik's Paradox.

Lastly, the PP movement analysis does not suffer from the second problem of the head-movement analysis, i.e., it does not wrongly predict that an aspect head can scope over a modal head, allowing flexible scope relations. Under the present analysis, heads do not move and hence, they preserve a rigid scope relation. I thus argue that the PP movement analysis is superior to the two analyses.

Let me now expand on the PP movement analysis. In this analysis, PPs are base-generated in the unique positions below Asp1. They can then undergo movement across aspect and modal heads, changing the scope relations between the PPs and the modal/aspect operators. (13) exemplifies the base structure of Temp and Loc, before scope movement takes place.

- (13) The PP movement analysis  

$$[\text{Mod}_{DN1} [\text{Mod}_{DN2} [\text{Mod}_{Vol} \dots [\text{Asp}_{\text{Result/Prog}} [\text{Asp1} [ \text{Temp} [\text{Loc} [\text{Asp2} \dots ]]]]]]]]]]$$

This analysis makes a prediction with regard to the scope relations between PPs and aspect and modal operators. If Temp and Loc in (13) undergo movement across the operators in a cyclic fashion, it should be possible to have Temp and Loc in other positions between  $\text{Mod}_{DN1}$  and  $\text{Asp1}_{\text{Start/Continue}}$ . For example, the analysis predicts that Temp can move to the position above  $\text{Asp}_{\text{Result/Prog}}$  and below  $\text{Mod}_{DN2}$ , yielding the following configuration.

- (14) 
$$[\text{Mod}_{DN2} [ \text{Temp}_j [ \text{Asp}_{\text{Result/Prog}} [ t_j [ V ] ] ] ] ]]$$

In what follows, I will demonstrate that this is indeed the case. Let me first show that Temp can be above  $\text{Asp}_{\text{Result/Prog}}$ . Consider sentence i(15) under the scenario where Taro dried the paint with a drier at five o'clock and the paint was still in a dried state at six o'clock. This scenario is compatible only with the wide scope reading of Temp in relation to the result state. Since the sentence in (15) is fine under this scenario, it indicates that the Temp PP 'at six o'clock' is outside the scope of the result state manifested by *tei*.



- (15) Penki-ga [<sub>Temp</sub> rokuzi-ni] kawai-*tei*-ru.  
 paint-NOM 6.o'clock-temp dry-TEI-PRES  
 'The paint was dry at 6 o'clock.'

It is possible to add the strong necessity deontic modal morpheme *nakerebanaranai* to the aspectual morpheme *tei*, as in (16).

- (16) Penki-ga [<sub>Temp</sub> rokuzi-ni] kawai-*tei-nakerebanaranai*.  
 paint-NOM 6.o'clock-temp dry-TEI-must.pres  
 'The paint must be dry at 6 o'clock.'

Consider the following scenario: Taro is preparing the chairs that will be used at the party which starts at 6 P.M. It is therefore obligatory that the paint on the chairs is dry at 6 P.M. What is important in this scenario is that the paint is in a dried state when the party starts at 6 o'clock. It does not matter whether it dried yesterday or at 5 o'clock today. Since the sentence in (16) is fine under this scenario, it indicates that the Temp PP modifies the result state and not the event of drying. From this, I infer that the sentence in (16) contains the scope relations schematized as  $\text{Mod}_{DN2} > \text{Temp} > \text{Asp}_{\text{Result/Prog}}$ . Assuming that scope is reflected in structure, the scope facts indicate that in sentence (16), Temp PP is in the position between  $\text{Mod}_{DN2}$  and  $\text{Asp}_{\text{Result/Prog}}$ . Thus the prediction that Temp can move to a position between  $\text{Asp}_{\text{Result/Prog}}$  and  $\text{Mod}_{DN2}$  (14) is borne out, giving support to the movement analysis of the PPs in (13).

### 5.1.2 Constraints on scope movement

The movement analysis, so far, gives an answer to the question posed in (3a). What remains to be answered are the question in (3b) and (3c); why are PPs divided into three groups and why do they appear relatively freely in the positions either above or below functional heads in their domain? Put differently, what constraints are there on PP movement? In order to provide answers to the questions, there are some assumptions I need to make. First, I suggest that each domain hypothesized in (2) contains different types of semantic variables. Domain A contains an inner event variable *i*, Domain B contains an outer event variable *o*, and Domain C contains a situation variable *s*, as schematized in (17). (cf. For a theory that brings together situation semantics and Davidsonian event semantics, see Kratzer 1989; 2007, etc). (*M.* in (17) stands for 'modifier', and *I/M* stands for 'Inst/Means'.)

- (17) [<sub>Mod<sub>DN2</sub>...</sub>[<sub>Asp1</sub>[Temp[Loc1[(Reas) [<sub>Asp2</sub>[Com[Sour[Goal[I/M [Mat[Man]]]]]]]]]]]]]]  
 —DomainC— —DomainB— —DomainA—  
 —Situation M.— —Outer Event M.— —Inner EventM.—

The introduction of the different semantic variables in (17) provides an answer to the question in (3b). Assuming that PPs are modifiers of semantic variables, the introduction of the different types of semantic variables imposes limits on which head the different PPs can scope over and under. For example, in (17), Com selects the outer event variable  $o$  as its semantic argument, and not the situation variable  $s$ . It is therefore correctly predicted that Com can scope both over and under the Asp2 head, but it cannot scope over higher aspect and modal heads, as observed in the previous chapter.

The second assumption concerns the semantic composition process. I assume that operators like Aspect and Modal denote a relation between two elements of sort  $s$ . Let us assume, for example, that an aspect operator denotes that one  $s$  is the result state of another  $s$ , called  $s'$  or one  $s$  is an ongoing subpart of a larger, potentially unrealized  $s'$ . In this view, an aspect operator can be represented as  $\text{Asp}(s, s')$ , which is a two-place relation between  $s$  and  $s'$ .<sup>2</sup> Under this approach, the semantic composition of a PP, call it Q, with an aspect operator would be either (18a) or (18b).

- (18) a.  $\text{Asp}(s, s') \ \& \ \text{Q}(s)$   
 b.  $\text{Asp}(s, s') \ \& \ \text{Q}(s')$

In (18a), Q modifies the first argument of Asp  $s$ , and this is translated as narrow scope of the PP in relation to the aspect operator, Asp. In (18b), on the other hand, Q modifies the second argument of Asp  $s'$ , and this is translated as wide scope of the PP with respect to the aspect operator. In the PP movement analysis, then, whether a PP scopes over or under an operator depends on whether the PP modifies the  $s$  or the  $s'$ . This is the answer to question (3c).

Let us now analyze semantic composition of a sentence with a Temp PP as an example. With respect to semantic composition, I adopt a standard view of event semantics in which a basic event involves an event variable. In the standard view, a sentence without a modifier PP in (19a) can be represented in a semantic notation as in (19b).

- (19) a. Happa-ga ochi-ru.  
 leaf-NOM fall-PRES  
 'The leaves fall.'  
 b.  $\exists e [ \text{fall}(l, e) ]$

Consider sentence (20) in which Temp either scopes over or under the  $\text{Asp}_{\text{Result}/\text{Prog}}$  head (see Chapter 4). In (20), the Temp PP 'on Wednesday morning' may take either wide or narrow scope in relation to  $\text{Asp}_{\text{Result}/\text{Prog}}$  manifested by *tei*. In the PP movement approach, the wide scope reading

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<sup>2</sup>I assume that  $\text{Asp}(s, s')$  is equivalent to  $\text{Asp}(x, y)$  where variables are restricted to sort  $s$ .

of Temp PP is represented in semantic notation in (20a). The narrow scope reading is represented in (20b). (In (20a) and (20b),  $R$  is a relation between the two semantic objects,  $e$  and  $s$ .)

- (20)  $[_{Temp}$  Suiyoo-no      asa-ni]      happa-ga ochi-*tei*-ta.  
          Wednesday-gen morning-temp leaf-NOM fall-TEI-PAST  
          ‘The leaves had fallen on Wednesday morning.’
- a.  $\exists s, s', e[ \text{fall}(l, e) \ \& \ R(e, s) \ \& \ \text{Asp}(s, s') \ \& \ \text{on Wednesday morning}(s') ]$
- b.  $\exists s, s', e[ \text{fall}(l, e) \ \& \ R(e, s) \ \& \ \text{Asp}(s, s') \ \& \ \text{on Wednesday morning}(s) ]$

In (20a), the PP ‘on Wednesday morning’ modifies the second semantic argument  $s'$ . That translates into wide scope of the PP in relation to the result state, which is manifested by the aspect morpheme *tei*. In contrast, in (20b), ‘on Wednesday morning’ modifies the first argument  $s$ . Since  $s$  is related to the argument  $e$  by the relation  $R$ ,  $s$  must be the innermost of the two  $s$  variables. The modification of  $s$  in (20b) therefore, gives rise to a narrow scope reading of the Temp PP. Thus, the present approach can describe the scope facts in (20) correctly.

### 5.1.3 Summary

In this section, based on the results of the compositionality tests in the previous chapter, I have argued for a PP movement approach to the positioning properties of modifier PPs in Japanese. I argued that PPs are generated below Asp 1 and that (some of them) undergo movement across aspect heads and modal heads, changing their scope in relation to these heads. With regard to the question as to why there are three PP classes, I gave an outline of a possible analysis in which PPs are modifiers of different semantic variables, an inner event variable  $i$ , an outer event variable,  $o$  and a situation variable  $s$ . Lastly, the relatively free scope relations between PPs and operators in their domains is explained in the following manner. Assuming that operators like Aspect are two-place relations between two semantic objects of sort  $s$ . Whether a PP scopes over or under the operator is determined by which semantic object the PP selects for.

## 5.2 Comparing different approaches

This thesis is comprised of three main parts: (i) a comparison of selected previous approaches to modifier PPs, (ii) an investigation of the underlying order of modifier PPs and (iii) an exploration of the mapping of modifier PPs onto clause structure. With regard to the investigation in (ii), I have applied

three tests to all possible combinations of different PP types in Japanese. The results of the quantifier scope test, the focus neutral order test and the informational focus test reveal that a given PP pair, PP1-PP2, shows the same asymmetry with respect to all three diagnostics. Based on this fact, I have argued that modifier PPs in Japanese are generated in a hierarchical fashion, schematized in (21).

- (21) Temp > Loc > Com > Reason > Source<sub>C</sub> > Goal > Inst/Means > Material > Manner

The findings from the investigation in (ii) imply that any successful theory of modifier PPs must explain the rigid ordering of the PPs in (21).

Given the hierarchy in (21), the investigation in (iii) attempts to discover the mapping of modifier PPs to clause structure. Compositionality scope is used to determine structural relations between different PP types and modal/aspect functors. The results of this investigation indicate that there are three domains, each of which contains different types of modifier PPs. Temp and Loc belong to the highest domain. Com, Reason, Source<sub>C</sub>, Goal, and Inst/Means belong to the intermediate domain. And, finally, Mat and Manner belong to the lowest domain. The results, furthermore, show that the PPs may appear either above or below aspect/modal heads within their domain. Thus, the findings from the investigation in (iii) require the theories on modifier PPs to explain the relative freedom that PPs enjoy within their respective domains.

As a possible analysis for the derivation of the PPs, I have argued for a PP movement analysis in which PPs are base-generated between Asp1P and the positions right below Asp2P. From these positions PPs undergo scope movement across aspect and modal heads. In order to account for what constrains the movement of PPs, I have made two assumptions. One is that PPs are modifiers predicated of different semantic variables which belong to different syntactic domains. The other is that an aspect operator and a modal operator serve as a two-place relation between two semantic objects  $s$  and  $s'$ . Given these two assumptions, a modifier PP like Temp can successfully scope either over or under Asp<sub>Result/Prog</sub>, depending on which semantic object it selects.

In conclusion, I would like to briefly compare the analyses presented in Chapter 1 with the PP movement analysis. Let me start with the VP-shell analysis of Larson (1988) in which modifier PPs are generated at the bottom of the VP-shell. In Chapter 1, I state that Larson's analysis cannot explain either constituency facts, e.g., a VP and a Loc PP, can form a constituent to the exclusion of a Temp PP, or binding facts, e.g., an antecedent embedded in a Loc PP can bind an anaphor in a Temp PP. Due to its failure in accounting for these facts, Larson's approach is argued not to be the optimal theory for modifier PPs. In addition to the aforementioned problems, my investigation in Chapter 4 reveals that most PPs can scope over aspect heads and that some

can even scope over modal heads which are assumed to be above VP. This presents another challenge to the Larsonian approach.

Pesetsky (1995) proposes a unique theory in which every construction is assigned two parallel structures, a cascade structure and a layered structure. His cascade structure explains the binding facts, and the layered structure explains the constituency facts. Due to its explanatory power, his analysis seems to be superior to Larson's. His theory, however, does not give an explanation for the findings from the investigation in Chapter 3, i.e., the PP hierarchy in (21). In Pesetsky's layered structure, modifier PPs are simply adjoined to the V' nodes, allowing the PPs to c-command each other. In his system, then, there is no asymmetric c-command relation among the modifier PPs. His analysis, therefore, cannot account for the quantifier scope data in Japanese (cf. Chapter 3) which show that asymmetric relations hold between two modifier PP. As a consequence, his theory cannot account for the fact that modifier PPs are generated hierarchically. In his cascade structure, on the other hand, modifier PPs are arranged in a hierarchical fashion. However, in a cascade structure, the order of the PPs seems to be the reverse of the one found in (21). For example, he assumes that Temp is lower than Loc. A cascade structure, therefore, cannot account for the rigid order of the PPs in (21), either.

I believe that the PP movement analysis is superior to both Larson's (1988) and Pesetsky's (1995). It makes a correct prediction with regard to the constituency facts. For instance, it correctly predicts that a Loc PP can form a constituent with a VP, excluding a Temp PP. With regard to binding facts, Japanese does not seem to show a clear asymmetry between two different orders of PPs.<sup>3</sup> Therefore, it is not clear whether the binding facts give any support to Pesetsky's cascade structure in Japanese. Furthermore, the PP movement analysis, with a fine-grained functional sequence of PPs, offers an

<sup>3</sup>Two orders of a given PP1-PP2 pair in Japanese do not show asymmetry in terms of pronominal binding. Consider the Temp-Loc pair in (i). In both the Temp-Loc order and the Loc-Temp order, the pronoun *kare* 'he' can refer to its antecedent *Taro*, when *Taro* precedes the pronoun.

- (i) a. Mary-wa [<sub>Temp</sub> Taro<sub>i</sub>-no tanzyoobi-ni] [<sub>Loc</sub> kare<sub>i</sub>-no  
 Mary-TOP Taro-GEN birthday-TEMP he-GEN  
 ie-de] keeki-o tabeta.  
 house-LOC cake-ACC ate.  
 'Mary ate a cake at his<sub>i</sub> house on Taro<sub>i</sub>'s birthday.'
- b. Mary-wa [<sub>Loc</sub> Taro<sub>i</sub>-no ie-de] [<sub>Temp</sub> kare<sub>i</sub>-no tanzyoobi-ni]  
 Mary-TOP Taro-GEN house-LOC he-GEN birthday-TEMP  
 keeki-o tabeta.  
 cake-ACC ate.  
 'Mary ate a cake at Taro<sub>i</sub>'s house on his birthday.'

When the pronoun precedes its antecedent, however, neither order is allowed.

explanation for the rigid ordering among modifier PPs.

With respect to Barbiers (1995) and Nilsen (1998), both theories assume that modifier PPs are generated as predicates on different syntactic projections above VP. Even though these analyses could account for a coarse correlation between PPs and some functional projections above VP, they fail to predict a fine-grained scope relation between different PP types and aspect/modal functors discovered in Chapter 4. For instance, in Barbiers' analysis, modifier PPs are correlated simply with higher VP projections, without further specification of the syntactic nature of the projections. His analysis, therefore, cannot, in a straight forward manner, explain the fine-grained scope facts among modifier PPs in Japanese.

Nilsen's analysis is little more specific with regard to the positions which PPs are related to. For example, he argues that *Loc* takes *Asp* as an argument. His analysis, however, does not explain why *Asp* can enter into a scope relation not only with different aspect heads, but also with modal heads. The PP movement analysis of modifier PPs, in which *Loc* is a modifier of a situation variable, combined with the assumption that *Aspect* and *Modal* are two-place predicates, can account for the fact that *Loc* can either scope over or under certain aspect and modal operators. I believe, therefore, that the present analysis is superior to these two analyses.

The idea that different types of PPs belong to different domains and that each PP selects for different semantic objects is reminiscent of Ernst's (2002) scope theory of adverbs. In Ernst's theory, different types of predicational adverbs select for different types of semantic objects. However, my analysis is more restrictive than Ernst's and, precisely due to this restrictiveness, is superior. Recall that in Ernst's (2002) analysis, ordering of modifier PPs is not restricted. He proposes that unlike predicational adverbs, modifier PPs do not select a semantic argument, but rather simply serve as a relation between a basic event and participants. Since modifier PPs do not enter into a scope relation between the semantic objects, they can be freely ordered. In his approach, then, the relative restrictiveness of scope relations between PPs and operators in a given domain in Japanese cannot be straightforwardly explained. As the findings of Chapter 4 suggest, modifier PPs show scope

- 
- (ii) a. ??Mary-wa [*Loc* kare<sub>i</sub>-no ie-de] [*Temp* Taro<sub>i</sub>-no tanzyoobi-ni]  
 Mary-TOP he-GEN house-LOC Taro-GEN birthdayTEMP  
 keeki-o tabeta.  
 cake-ACC ate.  
 'Mary ate a cake on Taro<sub>i</sub>'s birthday at his<sub>i</sub> house.'
- b. ??Mary-wa [*Temp* kare-no tanzyoobi-ni] [*Loc* Taro-no ie-de]  
 Mary-TOP he-GEN birthdayTEMP Taro-GEN house-LOC  
 keeki-o tabeta.  
 cake-ACC ate.  
 'Mary ate a cake at Taro<sub>i</sub>'s house on his<sub>i</sub> birthday.'

ambiguity between certain operators in a restricted domain. For instance, Temp and Loc can scope over and under some modal and aspect operators, whereas Mat and Manner can only scope under these operators. This relatively restricted scope relation between the PPs and the operators can be explained in my approach but not in Ernst's. Furthermore, my analysis, in which the base-order of PPs is rigid, straightforwardly explain the relative order of modifier PPs in (21). Ernst's theory, on the other hand, fails to explain the ordering facts.

To sum up, this investigation on modifier PPs in Japanese reveal that the relative order among modifier PPs is rigid but, simultaneously each modifier type allows relative scope freedom between certain functional heads within the domain it belongs to.

This dissertation, to my knowledge, is the first work to clarifies the fine-grained correlation between different PP types and certain aspect/modal functors. Hopefully, the findings in this dissertation, especially the ones from the investigation in Chapter 4, will contribute to a better understanding of modifier PPs and related issues.





# Appendix I: Focus neutral order

## Temp-Loc

- (22) a. Taro nitsuite oshietekudasai.  
Taro about tell.please  
'Please tell us about Taro.'
- b. Taro-wa [*Temp* doyoobi-ni] [*Loc* Ginza-de] kaimono-o  
Taro-TOP Saturday-temp Ginza-LOC shopping-ACC  
shimashita.  
did  
'Taro did shopping in Ginza on Saturday.'
- c. ??Taro-wa [*Loc* Ginza-de] [*Temp* Doyoobi-ni] kaimono-o shimashita

## Temp-Source

- (23) a. Taro nitsuite oshietekudasai.  
Taro about tell.please  
'Please tell us about Taro.'
- b. Taro-wa [*Temp* 3zi-ni] [*Goal* ie-kara] shuppatsu-shimashita.  
Taro-TOP 3.o'clock-TEMP Home-SOURCE start-did  
'Taro stared fom home at 3.'
- c. ??Taro-wa [*Goal* ie-kara] [*Temp* 3zi-ni] shuppatsu-shimashita

## Temp-Rea

- (24) a. Nani-ga okotta ka oshietekudasai.  
What-NOM happened Q tell.please  
'Please tell us what happened.'

- b. Taro-no ie-ga [*Temp* kayoobi-ni] [*Reason* koozui-de] yukashita-shinsui  
 Taro-gen house-nom Tuesday-TEMP flood-REA floor.level-inudation  
 shimashita.  
 did  
 ‘Taro’s house was inudated below the floor-level because of the  
 flood on Tuesday.’
- c. ?Taro-no ie-ga [*Reason* koozui-de] [*Temp* kayoobi-ni] yukashita-shinsui-  
 shimashita.

**Temp-Goal**

- (25) a. Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’
- b. Taro-wa [*Temp* haru-ni] [*Goal* Pari-ni] ryookoo-shimashita.  
 Taro-top spring-TEMP Pari-GOAL travel-did  
 ‘Taro travelled to Paris in spring.’
- c. ??Taro-wa [*Goal* Pari-ni] [*Temp* haru-ni] ryookoo-shimashita.

**Temp-Inst**

- (26) a. Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’
- b. Taro-wa [*Temp* 7 zi-kara] [*Inst* pasokon-de] shorui-o  
 Taro-TOP 7 hour-SOURCE pc-INST document-ACC  
 tsukuttemasu  
 make.prog  
 ‘Taro has been making documents by the pc from 7 o’clock.’
- c. ??Taro-wa [*Inst* pasokon-de] [*Temp* 7 zi-kara] shorui-o tsukuttemasu

**Loc-Rea**

- (27) a. Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’
- b. Taro-wa [*Loc* guraundo-de] [*Reason* neshabyoo-de] taoremashita.  
 Taro-top school.ground-LOC heatstroke-REA collapsed

- ‘Taro collapsed on the playground because of the heatstroke.’  
 c. ??Taro-wa [*Reason* neshshabyoo-de] [*Loc* guraundo-de] taoremashita.

**Loc-Com**

- (28) a. Taro ni tsuite oshietekudasai.  
 Taro about about tell.please  
 ‘Please tell as about Taro.’  
 b. Taro-wa [*Loc* kooen-de] [*Com* Mary-to] asobimashita  
 Taro-TOP park-LOC Mary-COM played  
 ‘Taro played with Mary in the park.’  
 c. ?Taro-wa [*Com* Mary-to] [*Loc* kooen-de] asobimashita

**Loc-Inst**

- (29) a. Kinoo-wa nani-o shimashita ka?  
 Yesterday what-ACC did Q  
 ‘What did you do yesterday?’  
 b. Boku-wa [*Loc* kooen-de] [*Inst* buranko-de] asobimashita  
 I-NOM park-LOC swing-INST played  
 ‘I played in the park with swing.’  
 c. \*Boku-wa [*Inst* buranko-de] [*Loc* kooen-de] asobimashita

**Locative-material**

- (30) a. Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’  
 b. Taro-wa [*Loc* ie-de] [*Mat* orikami-de] senbazuru-o orimashita.  
 Taro-TOP home-LOC paper-MAT crane-acc folded  
 ‘Taro folded cranes from origami papers at home.’  
 c. \*Taro-wa [*Mat* orikami-de] [*Loc* ie-de] senbazuru-o orimashita.

**Com-Source<sub>Place</sub>**

- (31) a. Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’

- b. Taro-wa [*Com* Mary-to] [*Source* uraguchi-kara] kaerimashita.  
 Taro-top Mary-COM back.door-SOURCE went.home  
 ‘Taro went home from the back door with Mary.’
- c. ??Taro-wa [*Source* uraguchi-kara] [*Com* Mary-to] kaerimashita.

**Com-Rea**

- (32) a. Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’
- b. Taro-wa [*Reason* kuzibiki-de] [*Com* Mary-to] odotta.  
 Taro-top drawing-REA Mary-COM danced  
 Taro danced with Mary by drawing.’
- c. ??Taro-wa [*Com* Mary-to] [*Reason* kuzibiki-de] odotta.

**Com-Goal**

- (33) a. Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’
- b. Taro-wa [*Com* Mary-to] [*Goal* Pari-ni] ryookoo-shimashita.  
 Taro-top Mary-COM Pari-GOAL travel-did  
 ‘Taro travelled to Paris with Mary.’
- c. ??Taro-wa [*Goal* Pari-ni] [*Com* Mary-to] ryookoo-shimashita.

**Com-Inst**

- (34) a. Taro nitsuite oshietekudasai.  
 Taro about tell.please  
 ‘Please tell us about Taro.’
- b. Taro-wa [*Com* Mary-to] [*Inst* hashi-de] gohan-o tabemashita.  
 Taro-top Mary-COM chopsticks-INST rice-acc ate  
 Taro ate rice with chopsticks with Mary.’
- c. Taro-wa [*Inst* hashi-de] [*Com* Mary-to] gohan-o tabemashita.

**Source-Means**

- (35) a. Taro nitsuite oshietekudasai.  
Taro about tell.please  
'Please tell us about Taro.'
- b. Taro-wa [*Source* eki-kara] [*Means* takusii-de] kaerimashita.  
Taro-TOP station-SOURCE taxi-means went.home  
'Taro went to the park from the station.'
- c. ??Taro-wa [*Means* takusii-de] [*Source* eki-kara] kaerimashita.

### Rea-Loc

- (36) a. Taro nitsuite oshietekudasai.  
Taro about tell.please  
'Please tell us about Taro.'
- b. Taro-wa [*reason* byooki-de] [*Locative* byooin-de] shuzyutsu-shita.  
'Taro-TOP disease-REASON hospital-LOC operation-did  
'Taro was operated in the hospital due to the disease.'
- c. ??Taro-wa [*Locative* byooin-de] [*reason* byooki-de] shuzyutsu-shita.

### Rea-Source<sub>Place</sub>

- (37) a. Nani-ga okotta ka oshietekudasai.  
What-NOM happened Q tell.please  
'Please tell us what happened.'
- b. Fune-ga [*Reason* arashi-de] [*Source* minato-kara] shukkoo-dekimasendeshita.  
ship-nom storm-REA port-SOURCE leave-could.not  
'The ship could not leave the port because of the storm.'
- c. ??Fune-ga [*Source* minato-kara] [*Reason* arashi-de] shukkoo-dekimasendeshita.

### Gaol-Means

- (38) a. Taro nitsuite oshietekudasai.  
Taro about tell.please  
'Please tell us about Taro.'
- b. Taro-wa [*Goal* kaisha-ni] [*Means* kuruma-de] tsuukin-shimashita.  
Taro-top work-GOAL car-means go-did  
'Taro went to the work by car.'
- c. ?Taro-wa [*Means* kuruma-de] [*Goal* kaisha-ni] tsuukin-shimashita.

**Goal-Means**

- (39) a. Kinoo-wa nani-o shimashita ka?  
 Yesterday what-ACC did Q  
 What did you do yesterday?
- b. Boku-wa [*Goal* suupaa-ni] [*Inst* kuruma-de] kaidashi-ni  
 I-TOP supermarket-GOAL car-means shopping-ni  
 ikimashita.  
 went  
 ‘I went shopping to a supermarket by car’
- c. (?)Boku-wa [*Inst* kuruma-de] [*Goal* suupaa-ni] kaidashi-ni ikimashita.

## Appendix II: Informational focus

### Temp<sub>wh</sub>-Com

- (40) a. Taro-ga [*Temp* nan-zi-ni] [*Com* Mary-to] eega-ni itta  
 Taro-NOM what-hour-TEMP Mary-COM movie-to went  
 no?  
 Q  
 ‘What Temp did Taro go to the movies with Mary?’
- b. Taro-wa [*Temp* 5-zi-ni] [*Com* Mary-to] eega-ni itta.  
 Taro-TOP 5-hour-TEMP Mary-COM movie-to went  
 ‘Taro went to the movies with Mary at 5 o’clock.’
- c. Taro-wa [*Com* Mary-to] [*Temp* 5-zi-ni] eega-ni itta.  
 Taro-TOP Mary-COM 5-hour-TEMP movie-to went  
 ‘Taro went to the movies with Mary at 5 o’clock.’

### Temp-Com<sub>wh</sub>

- (41) a. Taro-ga [*Temp* 5-zi-ni] [*Com* dare-to] eega-ni itta  
 Taro-NOM 5-hour-TEMP who-COM movie-to went  
 no?  
 Q  
 ‘With whom did Taro go to the movies at 5 o’clock?’
- b. Taro-wa [*Temp* 5-zi-ni] [*Com* Mary to] eega-ni  
 Taro-TOP 5-hour-TEMP Mary-COM movie-to went  
 itta.  
 ‘Taro went to the movies with Mary at 5 o’clock.’
- c. ??Taro-wa [*Com* Mary-to] [*Temp* 5-zi-ni] eega-ni itta.  
 Taro-TOP Mary-COM 5-hour-TEMP movie-to went  
 ‘Taro went to the movies with Mary at 5 o’clock.’

**Temp<sub>wh</sub>-Reason**

- (42) a. Gakkoo-ga [*Temp* nan-yoobi-ni] [*Rea* taifuu-de] kyuukoo-ni  
 school-NOM what-day-TEMP typhoon-REAS cancel-ni  
 natta no?  
 became Q  
 ‘In which day did the lectures get canceled because of the typhoon?’
- b. Gakko-wa [*Temp* getsuyoobi-ni] [*Rea* taifuu-de] kyuukoo-ni  
 school-NOM Monday-TEMP typhoon-REAS cancel-ni  
 narimashita.  
 became  
 ‘The lectures were canceled on Monday because of the typhoon.’
- c. \*Gakko-wa [*Rea* taifuu-de] [*Temp* getsuyoobi-ni] kyuukoo-ni  
 school-NOM typhoon-REAS Monday-TEMP cancel-ni  
 narimashita.  
 became  
 ‘The lectures were canceled on Monday because of the typhoon.’

**Temp-Reason<sub>wh</sub>**

- (43) a. Gakkoo-ga [*Temp* getsuyoobi-ni] [*Rea* nan-no riyuu-de]  
 school-NOM Monday-TEMP what-GEN reason-REAS  
 kyuukoo-ni natta no?  
 cancel-ni became Q  
 ‘From what reason did the lectures get canceled because of the typhoon?’
- b. Gakko-wa [*Temp* getsuyoobi-ni] [*Rea* taifuu-de] kyuukoo-ni  
 school-NOM Monday-TEMP typhoon-REAS cancel-ni  
 narimashita.  
 became  
 ‘The lectures were canceled on Monday because of the typhoon.’
- c. Gakko-wa [*Rea* taifuu-de] [*Temp* getsuyoobi-ni] kyuukoo-ni  
 school-NOM typhoon-REAS Monday-TEMP cancel-ni  
 narimashita.  
 became  
 ‘The lectures were canceled on Monday because of the typhoon.’

**Temp<sub>wh</sub>-Source**



- (44) a. Taro-ga [*Temp* nan-zi-ni] [*Source* ofisu-kara] detekita  
 Taro-NOM what-hour-TEMP office-SOURCE came.out  
 no?  
 Q  
 ‘What Temp did Taro come out of the office?’
- b. Taro-wa [*Temp* 5-zi-ni] [*Source* ofisu-kara] detekita.  
 Taro-TOP 5-hour-TEMP office-SOURCE came.out  
 ‘Taro came out of the office at 5 o’clock.’
- c. \*Taro-wa [*Source* ofisu-kara] [*Temp* 5-zi-ni] detekita.  
 Taro-TOP office-SOURCE 5-hour-TEMP came.out  
 ‘Taro came out of the office at 5 o’clock.’

### Temp-Source<sub>wh</sub>

- (45) a. Taro-ga [*Temp* go zi-ni] [*Source* doko-kara] detekita  
 Taro-NOM 5 hour-TEMP where-SOURCE came.out  
 no?  
 Q  
 ‘Where did Taro come out of at 5 o’clock?’
- b. Taro-wa [*Temp* 5 zi-ni] [*Source* ofisu-kara] detekita.  
 Taro-TOP 5 hour-TEMP office-SOURCE came.out  
 ‘Taro came out of the office at 5 o’clock.’
- c. Taro-wa [*Source* ofisu-kara] [*Temp* 5 zi-ni] detekita.  
 Taro-TOP office-SOURCE 5 hour-TEMP came.out  
 ‘Taro came out of the office at 5 o’clock.’

### Loc<sub>wh</sub>-Com

- (46) a. Taro-ga [*Loc* doko-de] [*Com* Mary-to] shokuzi-o shita no?  
 Taro-NOM where-LOC who-COM meal-ACC did Q  
 ‘Where did Taro have a meal with Mary?’
- b. Taro-wa [*Com* Mary-to] [*Loc* resutoran-de] shokuzi-o shita.  
 Taro-TOP Mary-COM restaurant-LOC meal-ACC did  
 ‘Taro had a meal with Mary at the restaurant.’
- c. Taro-wa [*Loc* resutoran-de] [*Com* Mary-to] shokuzi-o shita.  
 Taro-TOP restaurant-LOC Mary-COM meal-ACC did  
 ‘Taro had a meal with Mary at the restaurant.’

### Loc-Com<sub>wh</sub>

- (47) a. Taro-ga [*Loc* resutoran-de] [*Com* dare-to] shokuzi-o shita  
 Taro-NOM restaurant-LOC who-COM meal-ACC did  
 no?  
 Q  
 With whom did Taro have a meal in the restaurant?’
- b. Taro-wa [*Com* Mary-to] [*Loc* resutoran-de] shokuzi-o shita.  
 Taro-TOP Mary-COM restaurant-LOC meal-ACC did  
 ‘Taro had a meal with Mary at the restaurant.’
- c. Taro-wa [*Loc* resutoran-de] [*Com* Mary-to] shokuzi-o shita.  
 Taro-TOP restaurant-LOC Mary-COM meal-ACC did  
 ‘Taro had a meal with Mary at the restaurant.’

**Com<sub>wh</sub>-Source**

- (48) a. Taro-ga [*Com* dare-to] [*Source* uraguchi-kara] kaetta no?  
 Taro-nom who-com back.door-from went.home Q  
 ‘With whom did Taro go home from the back door?’
- b. Taro-wa [*Com* Mary-to] [*Source* uraguchi-kara] kaetta.  
 Taro-top Mary-com back.door-from went.home  
 ‘Taro went home from the back door with Mary.’
- c. Taro-wa [*Source* uraguchi-kara] [*Com* Mary-to] kaetta.

**Com-Source<sub>wh</sub>**

- (49) a. Taro-ga [*Com* Mary-to] [*Source* doko-kara] kaetta no?  
 Taro-nom Mary-com where-from went.home Q  
 ‘From where did Taro go home with Mary?’
- b. Taro-wa [*Com* Mary-to] [*Source* uraguchi-kara] kaetta.  
 Taro-top Mary-com back.door-from went.home  
 ‘Taro went home from the back door with Mary.’
- c. Taro-wa [*Source* uraguchi-kara] [*Com* Mary-to] kaetta.

**Source<sub>wh</sub>-Means**

- (50) a. Taro-ga [*Source* doko-kara] [*Mean* kuruma-de] kita no?  
 Taro-NOM where-SOURCE car-Mean came Q  
 ‘Where did Taro come from by car?’
- b. Taro-wa [*Source* eki-kara] [*Mean* kuruma-de] kita.  
 Taro-TOP station-SOURCE car-Mean came  
 ‘Taro came from the station by car.’

- c. ??Taro-wa [*Mean* kuruma-de] [*Source* eki-kara] kita.  
 Taro-TOP car-Mean station-SOURCE came  
 ‘Taro came from the station by car.’

**Source/Means<sub>wh</sub>**

- (51) a. Taro-ga [*Source* eki-kara] [*Mean* dono kootsuushudan-de]  
 Taro-NOM station-SOURCE which transport.means-MEAN  
 kita no?  
 came Q  
 ‘By what did Taro come from the station?’
- b. Taro-wa [*Source* eki-kara] [*Mean* kuruma-de] kita.  
 Taro-TOP station-SOURCE car-Mean came  
 ‘Taro came from the station by car.’
- c. Taro-wa [*Mean* kuruma-de] [*Source* eki-kara] kita.  
 Taro-TOP car-Mean station-SOURCE came  
 ‘Taro came from the station by car.’



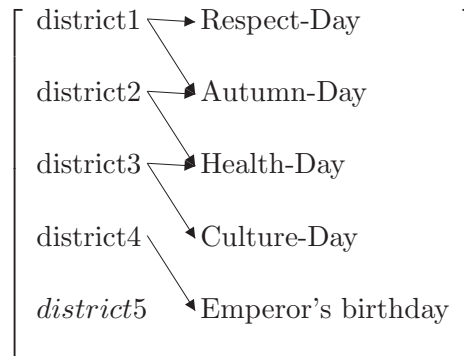
# Appendix III: Quantifier scope

## Temp-Loc

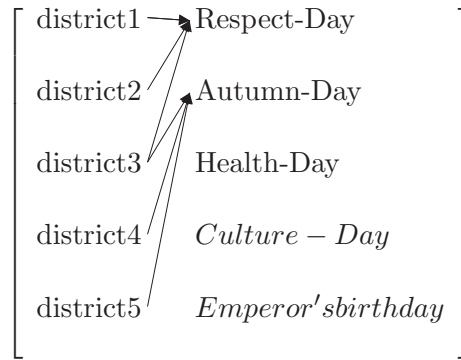
- (52) Abe daigishi-ga [*Temp* sukunakutomo 2 tu-no saizitsu-ni] [*Loc*  
 Abe diet.man-NOM at.least 2 cl-GEN holiday-TEMP  
 kennai-no hotondo-no senkyoku-de] enzetsu-shita.  
 prefecture-GEN most-GEN electoral.district-LOC campaign.speech-did  
 ‘A dietman Abe gave a campaign speech in most of the electoral districts in the prefecture on at least 2 holidays.’

- (53) Context  
 a. ‘Electoral districts’: District 1, 2, 3, 4 and 5.  
 b. ‘Holidays’: Respect-for-the-aged day, autumnal equinox day, health-sports day, culture day, and the emperor’s birthday.

- (54) a. \*most electoral districts > 2 holidays

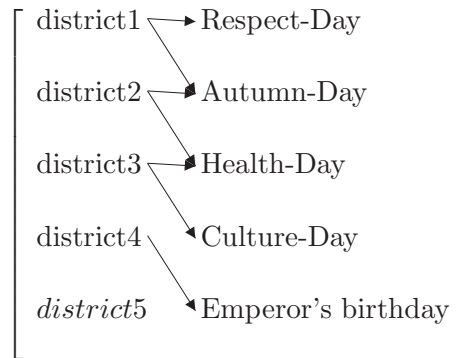


- b. OK most electoral districts < 2 holidays

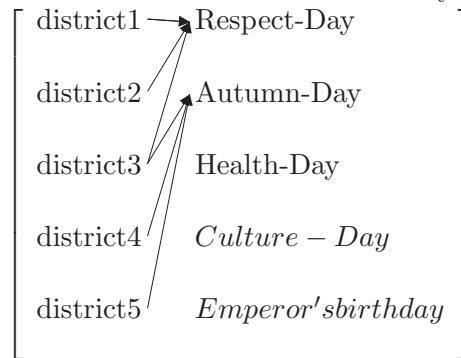


- (55) Abe daigishi-ga [<sub>Loc</sub> kennai-no hotondo-no senkyoku-de]  
 Abe diet.man-NOM prefecture-GEN most-GEN electoral.district-LOC  
 [<sub>Temp</sub> sukunakutomo 2 tu-no saizitsu-ni] enzetsu-shita.  
 at.least 2 cl-GEN holiday-TEMP campaign.speech-did  
 ‘A dietman Abe gave a campaign speech in most of the electoral districts in the prefecture on at least 2 holidays.’

- (56) a. OK most electoral districts > 2 holidays



- b. \*most electoral districts < 2 holidays



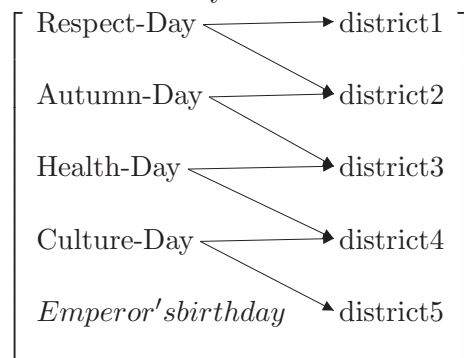
- (57) Abe daigishi-ga [*Temp* shimohanki-no hotondo-no saijitu-ni]  
 Abe diet.man-NOM second.half.period-GEN most-GEN holiday-TEMP  
 [*Loc* sukunakutomo 2 tu-no senkyoku-de] enzetsu-shita.  
 at.least 2 cl-GEN electoral.district-LOC campaign.speech-did

‘A diet man Abe gave a campaign speech in at least two electoral districts on most of the holidays in the second half of the year.’

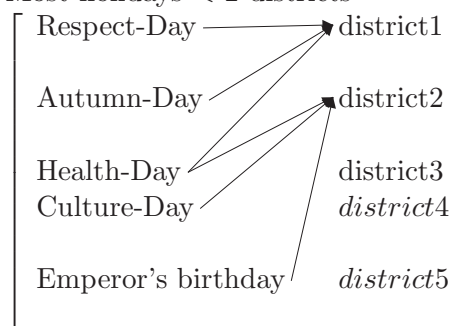
- (58) Context

- a. ‘Electoral districts’: District 1, 2, 3, 4 and 5.  
 b. ‘Holidays in the second half of the year’: Respect-for-the-aged day, autumnal equinox day, health-sports day, culture day, and the emperor’s birthday.

- (59) a. OK Most holidays > 2 districts



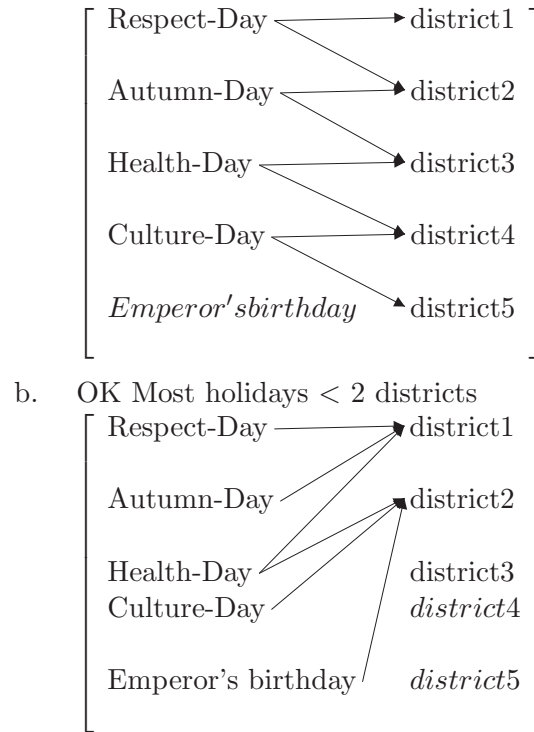
- b. \*Most holidays < 2 districts



- (60) Abe daigishi-ga [*Loc* sukunakutomo 2 tu-no senkyoku-de]  
 Abe diet.man-NOM at.least 2 cl-GEN electoral.district-LOC  
 [*Temp* shimohanki-no hotondo-no saijitu-ni] enzetsu-shita.  
 second.half.period-GEN most-GEN holiday-TEMP campaign.speech-did

‘A diet man Abe gave a campaign speech in at least two electoral districts on most of the holidays in the second half of the year.’

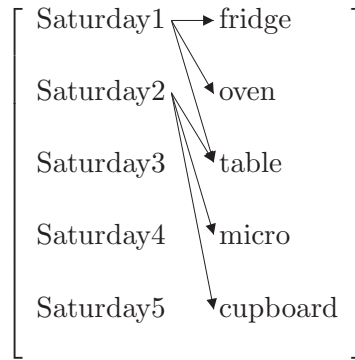
- (61) a. OK Most holidays > 2 districts



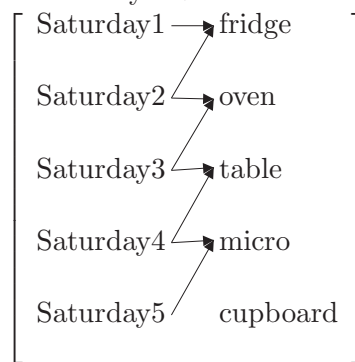
### Temp-Inst

- (62) a. Cleaning ladies is a group of an experimental musician. Every Saturday, they have a concert in which he plays with a strange instrument.
- b. Cleaning-ladies-wa [*Temp* (12gatsu-no) sukunakutomo 2tsu-no  
 Cleaning-ladies-top (December-gen) at.least 2.CL-GEN  
 doyoobi-ni] [*Inst* (daidokoro-no) hotondono kizai-de]  
 Saturday-TEMP (kitchen-gen) most instrument-INST  
 ensooshita.  
 played  
 'Cleaning ladies played with most of the equipments in the kitchen on at least 2 Saturdays of (December).'
- (63) a. Saturdays in December: Saturday 1, Saturday 2, Saturday 3, Saturday 4, and Saturday 5.
- b. Reasons: fridge, oven, table, cupboard, and micro.
- (64) a. 2 Saturdays > "most instruments"



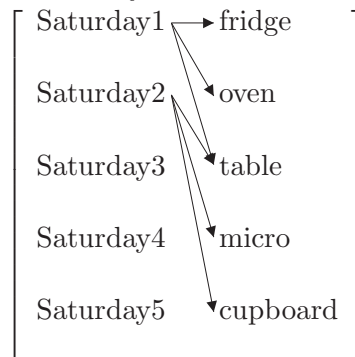


b. 2 Saturdays < "most instruments"

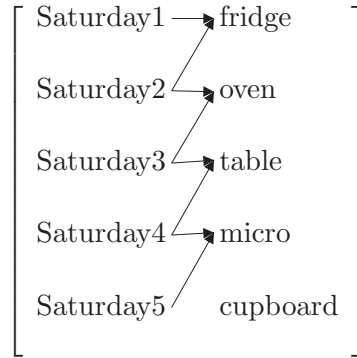


- (65) Cleaning-ladies-wa [*Inst* (daidokoro-no) hotondono kizai-de]  
 Cleaning-ladies-top (kitchen-gen) most instrument-INST  
 [*Temp* (12gatsu-no) sukunakutomo 2tsu-no doyoobi-ni] ensooshita.  
 (December-gen) at.least 2.CL-GEN Saturday-TEMP played  
 'Cleaning ladies played with most of the equipments in the kitchen on  
 at least 2 Saturdays of (December).'

(66) a. 2 Saturdays > "most instruments"



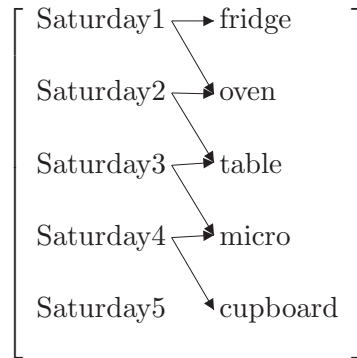
b. 2 Saturdays < "most instruments"

**Temp-Inst/Means**

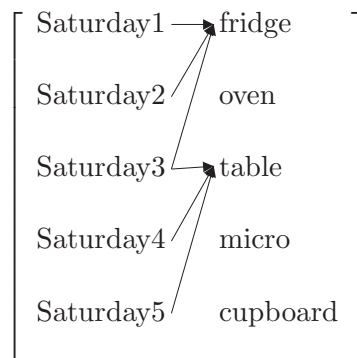
- (67) Cleaning-ladies-wa [*Temp* (12gatsu-no) hotondo-no doyoobi-ni]  
 Cleaning-ladies-top (December-gen) most-GEN Saturday-TEMP  
 [*Inst* sukunakutomo 2tsu-no kizai-de] ensooshita.  
 at.least 2.CL-GEN instrument-INST played  
 ‘Cleaning ladies played with at least 2 equipments in the kitchen on  
 most of the Saturdays of (December).’

- (68) a. Saturdays in December: Saturday 1, Saturday 2, Saturday 3,  
 Saturday 4, and Saturday 5.  
 b. Reasons: fridge, oven, table, cupboard, and micro.

- (69) a. Most Saturdays > ”2 instruments”

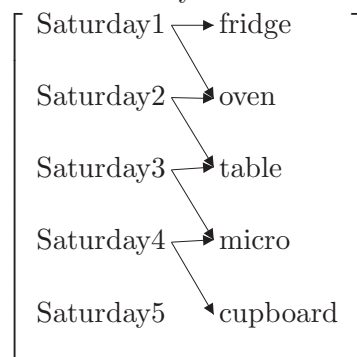


- b. Most Saturdays < ”2 instruments”

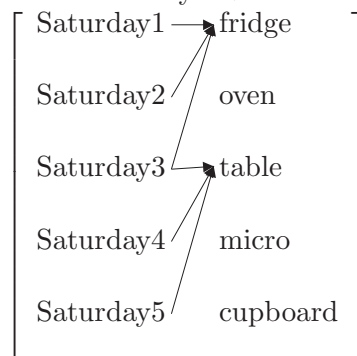


- (70) Cleaning-ladies-wa [*Inst* sukunakutomo 2tsu-no kizai-de]  
 Cleaning-ladies-TOP at.least 2.CL-GEN instrument-INST  
 [*Temp* (12gatsu-no) hotondo-no doyoobi-ni] ensooshita.  
 (December-gen) most-GEN Saturday-TEMP played  
 ‘Cleaning ladies played with at least 2 equipments in the kitchen on  
 most of the Saturdays of (December).’

- (71) a. Most Saturdays > ”2 instruments”

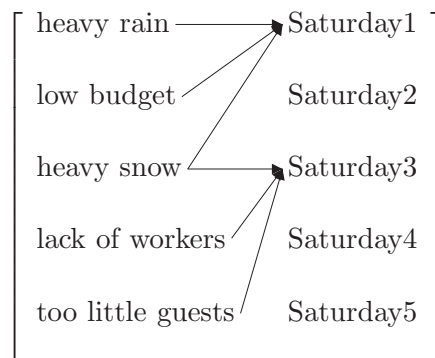


- b. Most Saturdays < ”2 instruments”

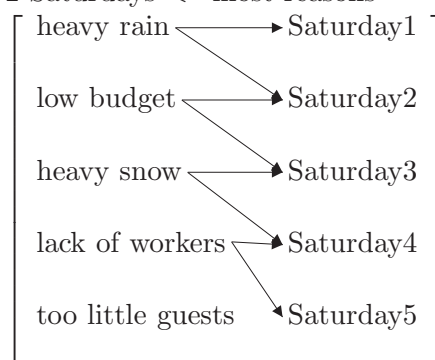


### Temp-Reason

- (72) Sono yuuenchi-wa [*Temp* (12gatsu-no) sukunakutomo 2tsu-no  
 that fairground-top (December-gen) at.least 2.CL-GEN  
 doyoobi-ni] [*Reason* (zenjutsu-no) hotondono riyuu-de]  
 Saturday-TEMP (above-mentioned-gen) most reason-REAS  
 heikanshiteita.  
 close.Asp.PAST  
 ‘The fairground has been closed for at least 2 Saturdays of (December)  
 because of most of the above-mentioned reasons.’
- (73) a. Saturdays in December: Saturday 1, Saturday 2, Saturday 3,  
 Saturday 4, and Saturday 5.  
 b. Reasons: heavy snow, heavy rain, low budget, lack of workers  
 and too little guests
- (74) a. 2 Saturdays > ”most reasons”
- |                   |   |           |
|-------------------|---|-----------|
| heavy rain        | → | Saturday1 |
| low budget        | → | Saturday2 |
| heavy snow        | → | Saturday3 |
| lack of workers   | → | Saturday4 |
| too little guests | → | Saturday5 |
- b. 2 Saturdays < ”most reasons”
- |                   |   |           |
|-------------------|---|-----------|
| heavy rain        | → | Saturday1 |
| low budget        | → | Saturday2 |
| heavy snow        | → | Saturday3 |
| lack of workers   | → | Saturday4 |
| too little guests | → | Saturday5 |
- (75) Sono yuuenchi-wa [*Reason* (zenjutsu-no) hotondono riyuu-de]  
 that fairground-TOP (above-mentioned-gen) most reason-REAS  
 [*Temp* (12gatsu-no) sukunakutomo 2tsu-no doyoobi-ni] heikanshiteita.  
 (December-gen) at.least 2.CL-GEN Saturday-TEMP close.AspPAST  
 ‘The fairground has been closed for at least 2 Saturdays of (December)  
 because of most of the above-mentioned reasons.’
- (76) a. 2 Saturdays > ”most reasons”

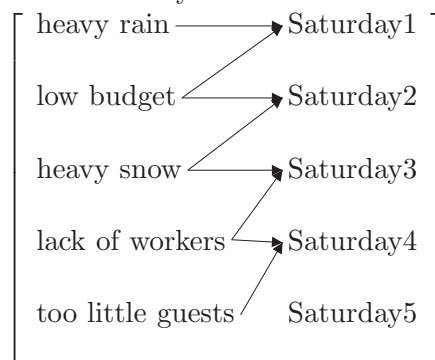


b. 2 Saturdays < "most reasons"

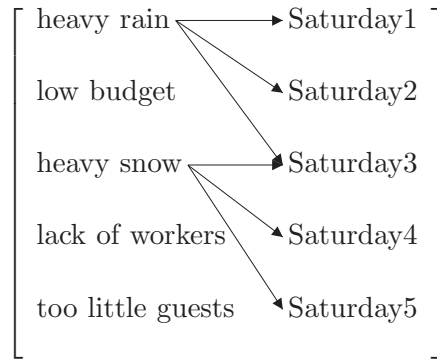


- (77) Sono yuuenchi-wa [*Temp* (12gatsu-no) hotondo-no doyoobi-ni]  
 that fairground-TOP (December-gen) most-GEN Saturday-TEMP  
 [*Reason* sukunakutomo 2tsu-no riyuu-de] heikanshiteita.  
 at.least 2.CL-GEN reason-REAS close.Asp.PAST  
 'The fairground has been closed for most of the Saturdays (of Decem-  
 ber) because of at least 2 reasons.'

(78) a. most Saturdays > "2 reasons"



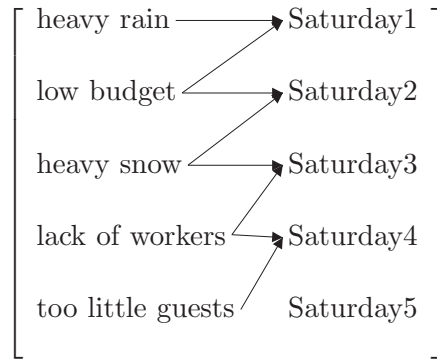
b. most Saturdays < "2 reasons"



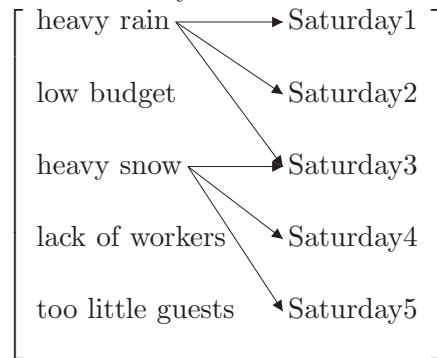
(79) Temp<sub>most</sub> -Reason<sub>2</sub>

(80) Sono yuuenchi-wa [*Reason* sukunakutomo 2tsu-no riyuu-de]  
 that fairground-TOP at.least 2.CL-GEN reason-REAS  
 [*Temp* (12gatsu-no) hotondo-no doyoobi-ni] heikanshiteita.  
 (December-gen) most-GEN Saturday-TEMP close.Asp.PAST  
 ‘The fairground has been closed for most of the Saturdays (of December) because of at least 2 reasons.’

(81) a. most Saturdays > "2 reasons"



b. most Saturdays < "2 reasons"



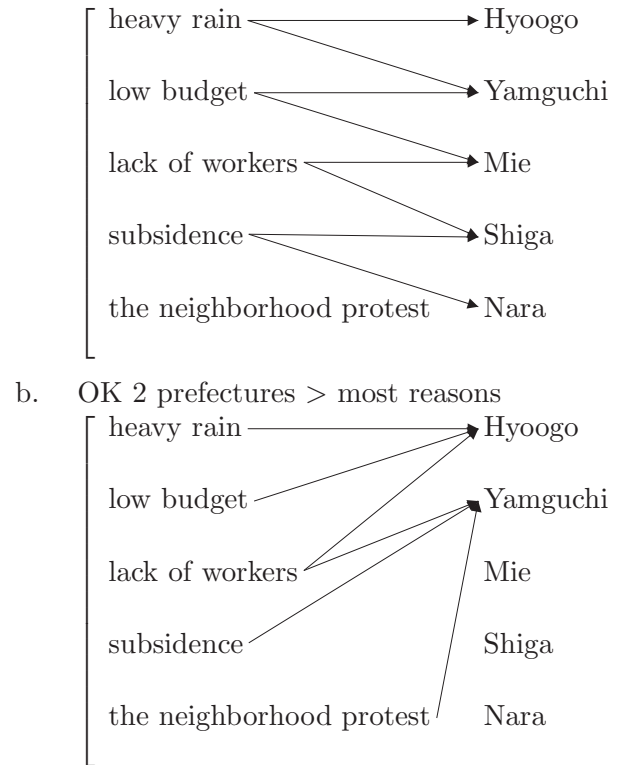
- (82) Tonneru-koozi-ga [<sub>Loc</sub> sukunakutomo 2tsu-no ken-de]  
 tunnel-construction-NOM at.least 2.CL-GEN prefecture-LOC  
 [<sub>Rea</sub> (zenzyutsu-no) hotondo-no riyuu-kara] chuudan-sare-te  
 (above-mentioned-gen) most-GEN reason-REASON interrupt-PASS-ASP  
 iru.  
 COPL.PRES  
 ‘The construction work of tunnels are interrupted in at least two pre-  
 fectures due to most of the the above-memtioned reasons.’

- (83) a. \*2 prefectures < "most reasons"
- 
- b. OK 2 prefectures > most reasons
- 

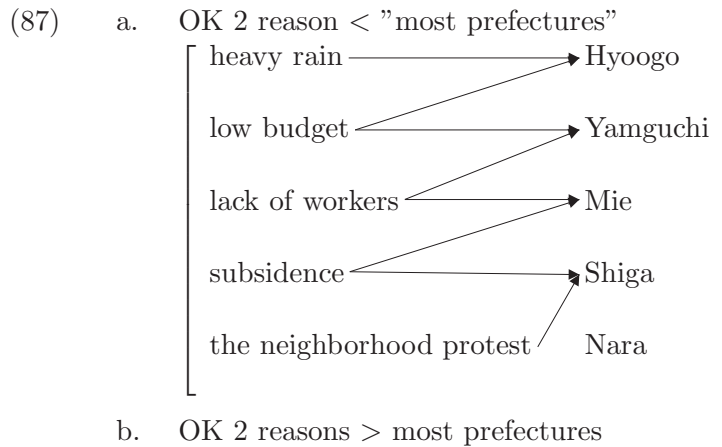
### Reason-Loc

- (84) Tonneru-koozi-ga [<sub>Rea</sub> (zenzyutsu-no) hotondo-no riyuu-kara]  
 tunnel-construction-NOM (above-mentioned-gen) most-GEN reason-REASON  
 [<sub>Loc</sub> sukunakutomo 2tsu-no ken-de] chuudan-sare-te iru.  
 at.least 2.CL-GEN prefecture-LOC interrupt-PASS-ASP COPL.PRES  
 ‘The construction work of tunnels are interrupted in at least two pre-  
 fectures due to most of the the above-memtioned reasons.’

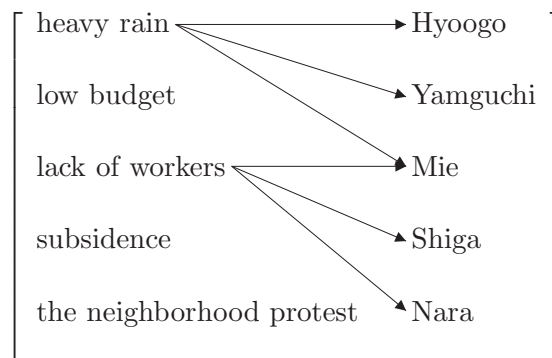
- (85) a. \*2 prefectures < "most reasons"



- (86) Tonneru-koozi-ga [*Rea* sukunakutomo 2tsu-no riyuu-kara]  
 tunnel-construction-NOM at.least 2.CL-GEN reason-REASON  
 [*Loc* hotondo-no ken-de] chuudan-sare-te iru.  
 most-GEN prefecture-LOC interrupt-PASS-ASP COPL.PRES  
 ‘The construction work of tunnels are interrupted in most of the prefectures due to at least two reasons.’

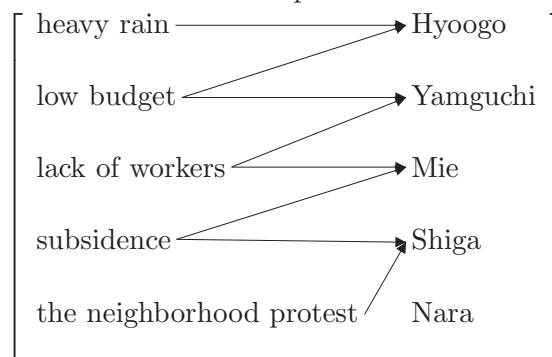




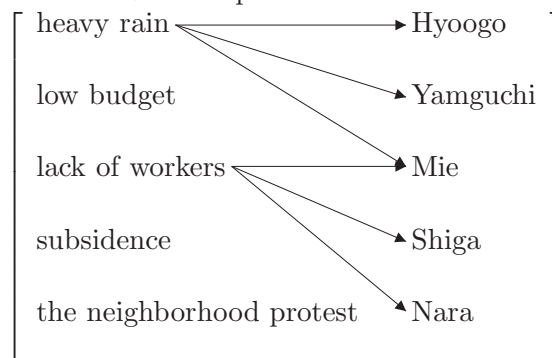


- (88) Tonneru-koozi-ga [*Loc* hotondo-no ken-de] [*Rea* sukunakutomo  
 tunnel-construction-NOM most-GEN prefecture-LOC at.least  
 2tsu-no riyuu-kara] chuudan-sare-te iru.  
 2.CL-GEN reason-REASON interrupt-PASS-ASP COPL.PRES  
 ‘The construction work of tunnels are interrupted in most of the pre-  
 fectures due to at least two reasons.’

- (89) a. OK 2 reason < "most prefectures"



- b. \*2 reasons > most prefectures

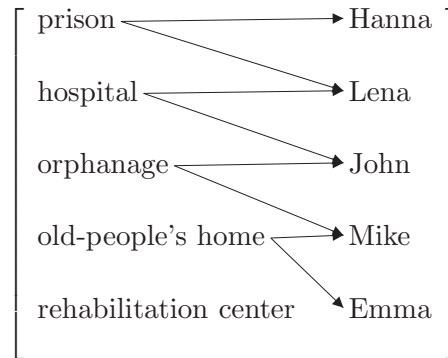


- (90) Yamada sensei-ga [<sub>Loc</sub> kennai-no hotondo-no shisetsu-de]  
 Yamada teacher-NOM prefecture-GEN most-GEN institution-LOC  
 [<sub>Com</sub> sukunakutomo 2ri-no gakusei-to] borantia-o shita.  
 at-least 2.CL-GEN student-com volunteer-ACC did  
 ‘Mr Yamada did a volunteer work with at least 2 students in most of  
 the prefectural institutions.’

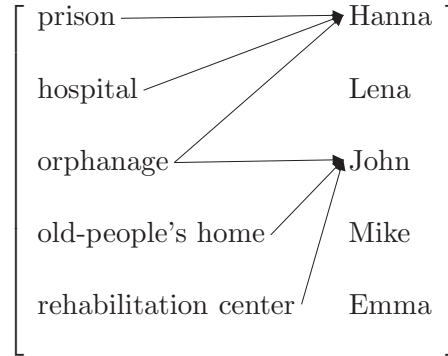
- (91) Context

- a. Institutes: orphanage, hospital, prison, old-people’s home and rehabilitation center
- b. Students: John, Lena, Mike, Emma and Hanna.

- (92) a. OK most institutions > 2 studentss

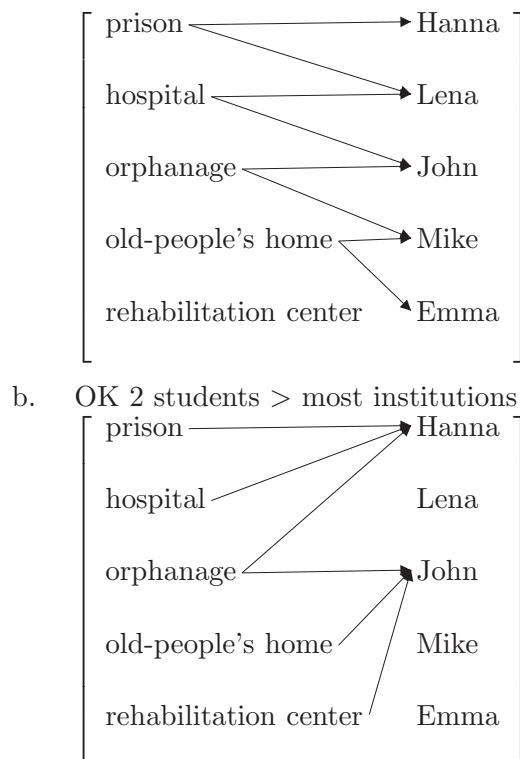


- b. \*2 students > most institutions

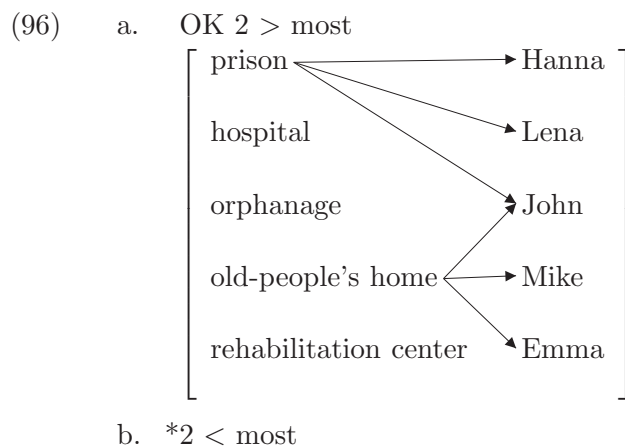


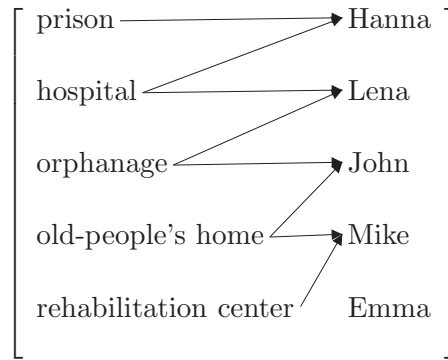
- (93) Yamada sensei-ga [<sub>Com</sub> sukunakutomo 2ri-no gakusei-to] [<sub>Loc</sub>  
 Yamada teacher-NOM at-least 2.CL-GEN student-com  
 kennai-no hotondo-no shisetsu-de] borantia-o shita.  
 prefecture-GEN most-GEN institution-LOC volunteer-ACC did  
 ‘Mr Yamada did a volunteer work with at least 2 students in most of  
 the prefectural institutions.’

- (94) a. ?most institutions > 2 studentss

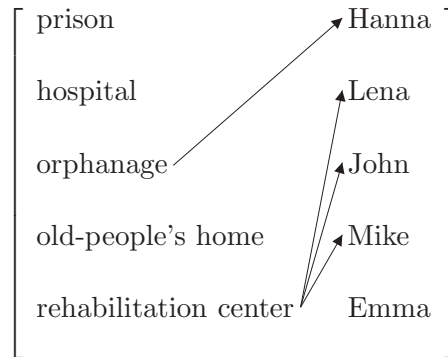


- (95) Yamada sensei-ga [<sub>Loc</sub> sukunakutomo 2tsu-no shisetsu-de]  
 Yamada teacher-NOM at.least 2.CL-GEN institution-LOC  
 [<sub>Com</sub> hotondo-no gakusei-to] borantia-o shita.  
 most-GEN student-com volunteer-ACC did  
 'Mr Yamada did a volunteer work with at least 2 students in most of  
 the prefectural institutions.'



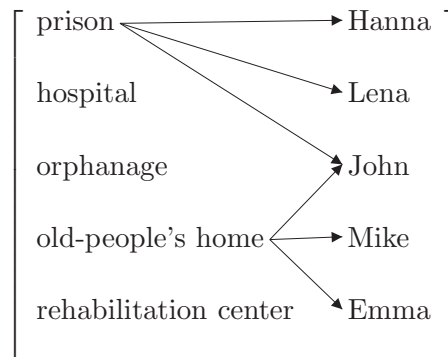


c. \*weak reading

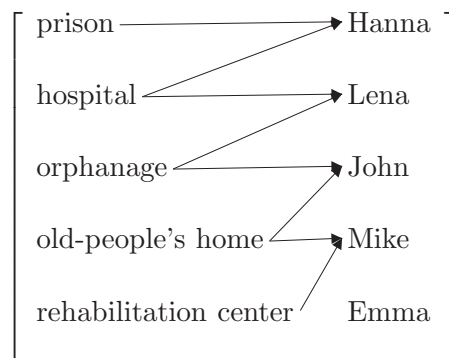


- (97) Yamada sensei-ga [<sub>Com</sub> hotondo-no gakusei-to] [<sub>Loc</sub>  
 Yamada teacher-NOM most-GEN student-com volunteer-ACC  
 sukunakutomo 2tsu-no shisetsu-de] borantia-o shita.  
 at.least 2.CL-GEN institution-LOC did  
 ‘Mr Yamada did a volunteer work with at least 2 students in most of  
 the prefectural institutions.’

(98) a. OK 2 &gt; most



b. OK 2 &lt; most

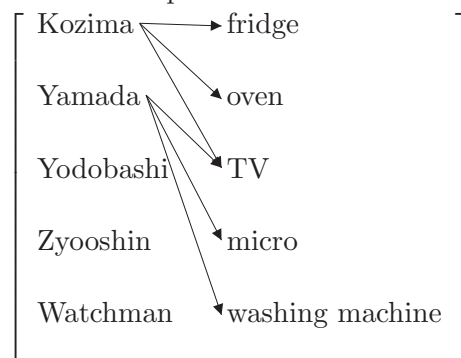


### Loc-Inst/Means

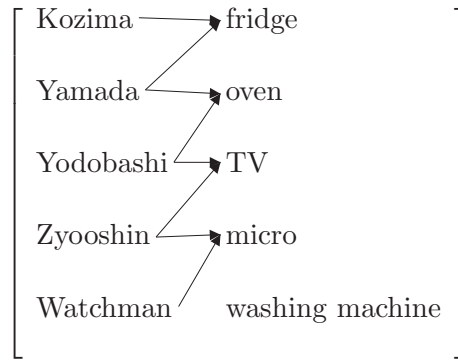
- (99) a. Cleaning ladies is a group of an experimental musician. They have a concert in different places where they play with strange instruments.
- b. Cleaning-ladies-wa [*Loc* (machi-no) sukunakutomo 2tsu-no denkiya-de]  
 Cleaning-ladies-top (city-gen) at.least 2.CL-GEN electro.shop-LOC  
 [*Inst* (sokoniaru) hotondono seehin-de] ensoo-o shita.  
 (their) most product-INST play-ACC did  
 ‘Cleaning ladies played with most of the products at least in 2 electro shops in the city.’

- (100) Context
- a. Kozima, Yamada, Yodobashi, Zyooshin and Watchman.
- b. Inst: fridge, oven, washing machine, TV, and micro.

- (101) a. 2 electro shop > "most instruments"

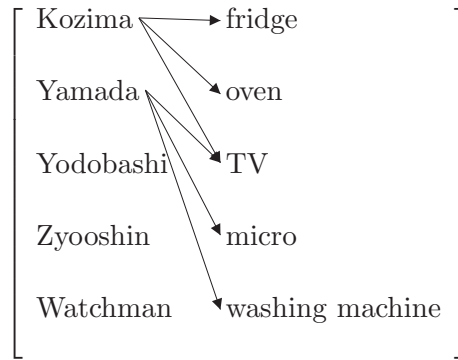


- b. 2 electro shop < "most instruments"

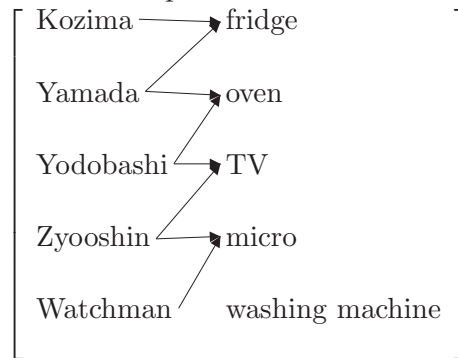


- (102) Cleaning-ladies-wa [*Inst* (sokoniaru ) hotondono sehin-de]  
 Cleaning-ladies-top (their) most product-INST  
 [*Loc* (machi-no) sukunakutomo 2tsu-no denkiya-de]  
 (city-gen) at.least 2.CL-GEN electro.shop-LOC play-ACC  
 ensoo-o shita.  
 did  
 ‘Cleaning ladies played with most of the products at least in 2 electro  
 shops in the city.’

- (103) a. 2 electro shop > ”most instruments”

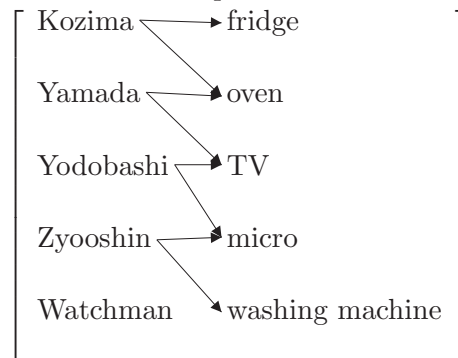


- b. 2 electro shop < ”most instruments”

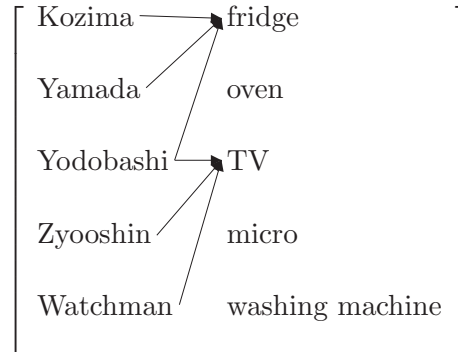


- (104) Cleaning-ladies-wa [*Loc* (machi-no) hotondo-no denkiya-de] [*Inst*  
 Cleaning-ladies-top (city-gen) most-GEN electro.shop-LOC  
 sukunakutomo 2tsu-no seehin-de] ensoo-o shita.  
 at.least 2.CL-GEN product-INST play-ACC did  
 ‘Cleaning ladies played at least with 2 products in most of the electro  
 shops in the city.’

- (105) a. most electro shop > ”2 instruments”

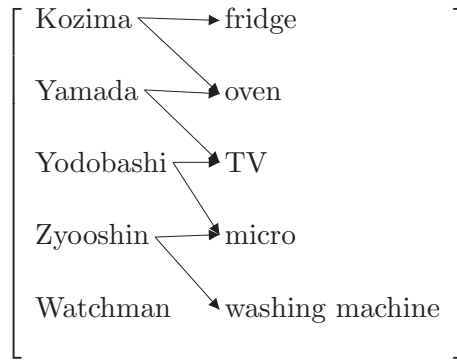


- b. most electro shops < ”2instruments”

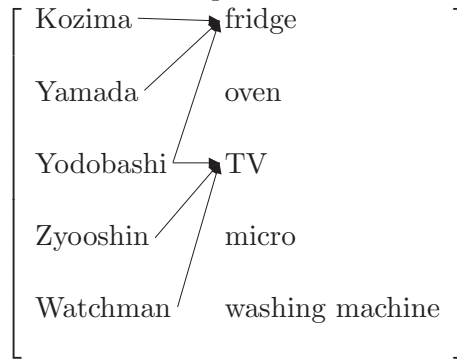


- (106) Cleaning-ladies-wa [*Inst* sukunakutomo 2tsu-no seehin-de] [*Loc*  
 Cleaning-ladies-top at.least 2.CL-GEN product-INST  
 (machi-no) hotondo-no denkiya-de] ensoo-o shita.  
 (city-gen) most-GEN electro.shop-LOC play-ACC did  
 ‘Cleaning ladies played at least with 2 products in most of the electro  
 shops in the city.’

- (107) a. most electro shop > ”2 instruments”



b. most electro shops < "2instruments"



### Loc-Source

(108) Gozira-ga [*Loc* hotondo-no gekigyoo-de] [*Source* sukunakutomo 2tsu-no  
Gozira-NOM most-GEN theater-LOC below-GEN at.least  
zikantai-kara] zyooeis-are-teiru.

2.CL-GEN time.zone-SOURCE show-PASS-ASP.pres

'The Gozira is shown in most of the theaters at least from 2 time  
below.'

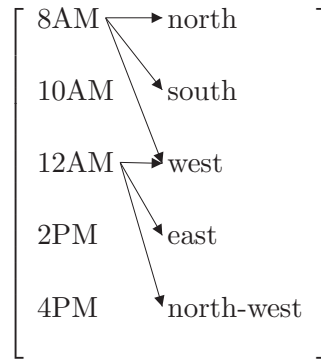
(109) Context

a. Time zone: 8AM, 10AM, 12AM, 2PM, and 4PM

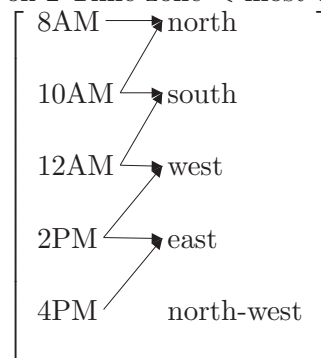
b. theater: north, west, south, east and north-west

(110) a. no 2 Time zone > most theaters



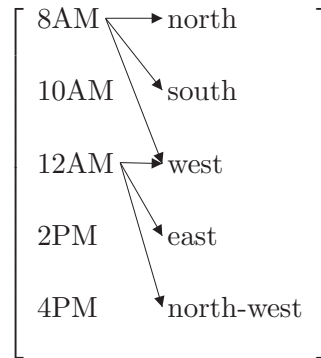


b. ok 2 Time zone < most theaters

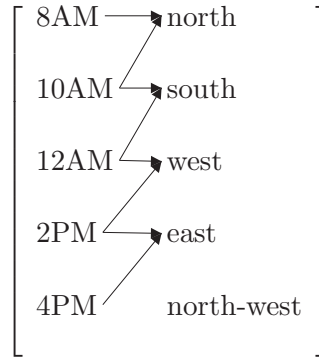


- (111) Gozira-ga [*Source* sukunakutomo 2tsu-no zikantai-kara] [*Loc*  
 Gozira-NOM below-GEN at.least 2.CL-GEN time.zone-SOURCE  
 hotondo-no gekigyoo-de] zyooeis-are-teiru.  
 most-GEN theater-LOC show-PASS-ASP.pres  
 'The Gozira is shown in most of the theaters at least from 2 time  
 below.'

(112) a. ok 2 Time zone > most theaters



b. ok 2 Time zone < most theaters

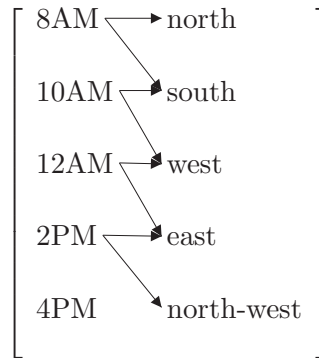


- (113) Gozira-ga [<sub>Loc</sub> sukunakutomo 2tsu-no gekigyoo-de] [<sub>Source</sub> ika-no  
 Gozira-NOM at.least 2.CL-GEN theater-LOC below-GEN  
 hotondo-no zikan-kara] zyooeis-are-teiru.  
 most-GEN time.zone-SOURCE show-PASS-ASP.pres  
 ‘The Gozira is shown at least in 2 theaters from most of the time  
 below.’

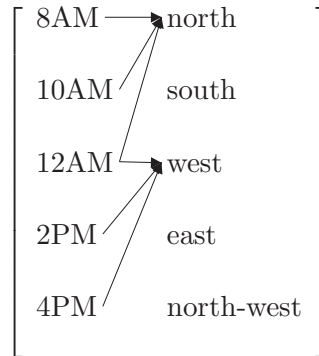
- (114) Context

- Time zone: 8AM, 10AM, 12AM, 2PM, and 4PM
- theater: north, west, south, east and north-west

- (115) a. ok most Time zone > 2 theaters



- b. ok most Time zone < 2 theaters

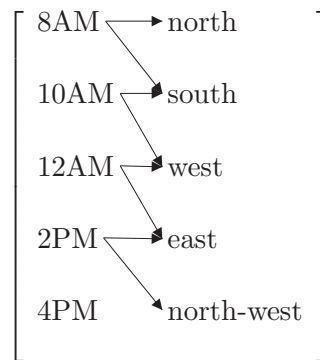


- (116) Gozira-ga [*Source* ika-no hotondo-no zikan-kara] [*Loc*  
 Gozira-NOM below-GEN most-GEN time.zone-SOURCE  
 sukunakutomo 2tsu-no gekigyoo-de] zyooeis-are-teiru.  
 at.least 2.CL-GEN theater-LOC show-PASS-ASP.pres  
 ‘The Gozira is shown at least in 2 theaters from most of the time  
 below.’

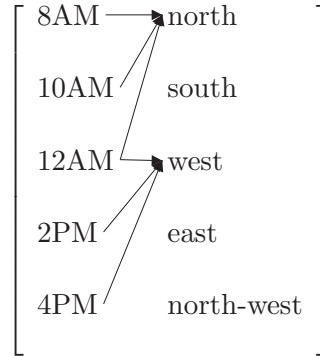
- (117) Context

- a. Time zone: 8AM, 10AM, 12AM, 2PM, and 4PM  
 b. theater: north, west, south, east and north-west

- (118) a. ok most Time zone > 2theaters



- b. no most Time zone < 2 theaters

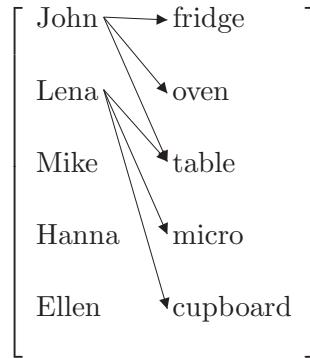


### Com-Inst/Means

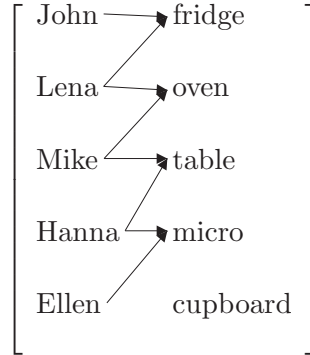
- (119) a. Taro copies a band called "Cleaning ladies", and he plays with  
 a strange instrument with his friends experimentally.  
 b. Taro-wa [*Com* sukunakutomo 2ri-no tomodachi-to] [*Inst* (daidokoro-no)  
 Taro-top at.least 2.CL-GEN friend-com (kitchen-gen)  
 hotondono kizai-de] ensooshita.  
 most instrument-INST played  
 ‘Taro played with most of the equipments in the kitchen at least  
 with 2 friends.’

- (120) a. Friends: John, Lena, Mike, Hanna, Ellen  
 b. Instruments: fridge, oven, table, cupboard, and micro.

- (121) a. 2 friends > "most instruments"

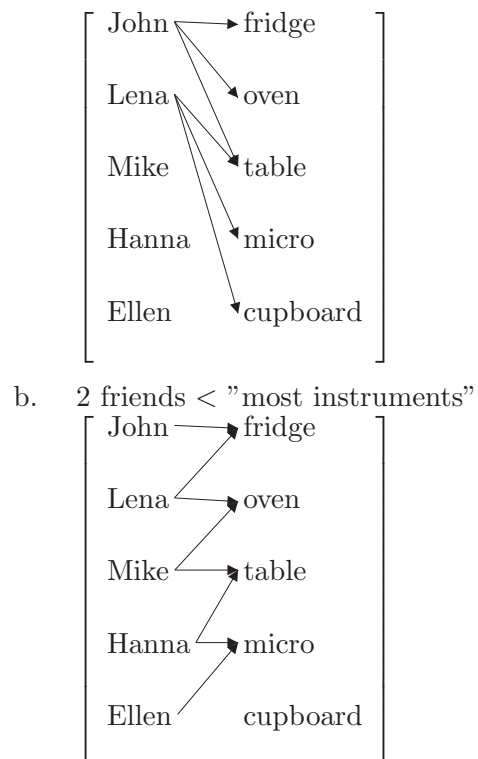


- b. 2 friends < "most instruments"



- (122) a. Taro copies a band called "Cleaning ladies", and he plays with a strange instrument with his friends experimentally.  
 b. Taro-wa [*Inst* (daidokoro-no) hotondono kizai-de] [*Com*  
 Taro-top (kitchen-gen) most instrument-INST  
 sukunakutomo 2ri-no tomodachi-to] ensooshita.  
 at.least 2.CL-GEN friend-com played  
 'Taro played with most of the equipments in the kitchen at least with 2 friends.'

- (123) a. 2 friends > "most instruments"

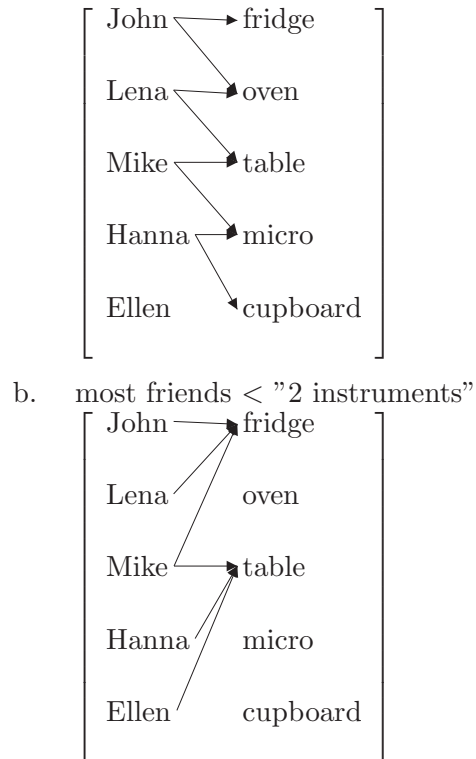


(124)  $Com_{most}/Inst_2$

- (125) a. Taro copies a band called "Cleaning ladies", and he plays with a strange instrument with his friends experimentally.  
 b. Taro-wa [*Com* hotondo-no tomodachi-to] [*Inst* sukunakutomo Taro-top most-GEN friend-com at.least 2tsu-no kizai-de] ensooshita.  
 2.CL-GEN instrument-INST played  
 'Taro played with at least 2 equipments in the kitchen with most of his friends.'

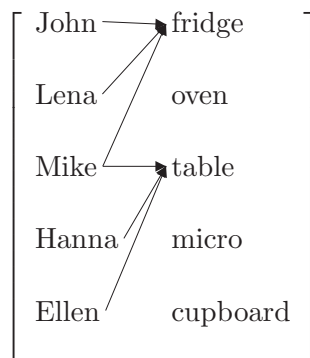
- (126) a. Friends: John, Lena, Mike, Hanna, Ellen  
 b. Instruments: fridge, oven, table, cupboard, and micro.

(127) a. most friends > "2 instruments"



- (128) Taro-wa [<sub>Inst</sub> sukunakutomo 2tsu-no kizai-de] [<sub>Com</sub> hotondo-no  
 Taro-top at.least 2.CL-GEN instrument-INST most-GEN  
 tomodachi-to] ensooshita.  
 friend-com played  
 'Taro played with at least 2 equipments in the kitchen with most of  
 his friends.'

- (129) a. most friends > "2 instruments"
- 
- a.  $\left[ \begin{array}{l} \text{John} \rightarrow \text{fridge} \\ \text{Lena} \rightarrow \text{oven} \\ \text{Mike} \rightarrow \text{table} \\ \text{Hanna} \rightarrow \text{micro} \\ \text{Ellen} \rightarrow \text{cupboard} \end{array} \right]$
- b. most friends < "2 instruments"

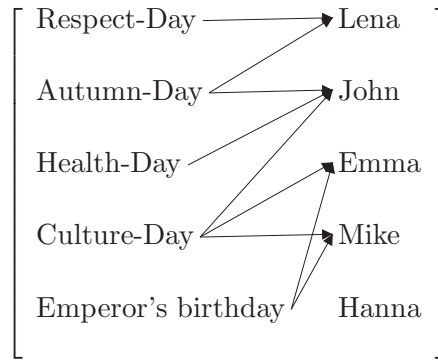


### Temp-Com

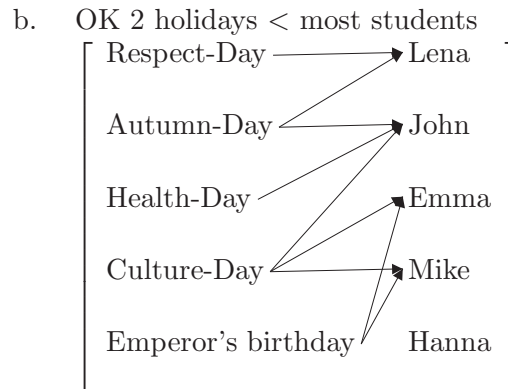
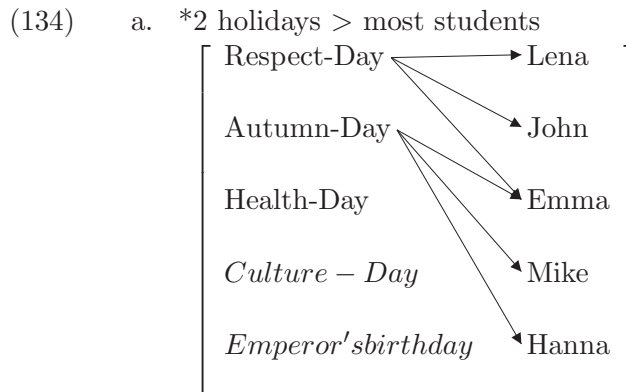
- (130) Yamada sensei-wa [*Temp* sukunakutomo 2tu-no saijitsu-ni]  
 Yamada teacher-TOP at.least 2cl-GEN holiday-TEMP  
 [*Com* hotondo-no gakusee-to] zyogingu-shita.  
 most-GEN student-COM jogging-do  
 ‘The teacher Yamada jogs with most of the students on at least two holidays.’

- (131) Context
- ‘Holidays’: Respect-for-the-aged day, autumnal equinox day, health-sports day, culture day, and the emperor’s birthday.
  - students: Lena, John, Emma, Mike, and Hanna.

- (132) a. OK 2 holidays > most students
- 
- |                           |   |       |
|---------------------------|---|-------|
| Respect-Day               | → | Lena  |
| Autumn-Day                | → | John  |
| Health-Day                | → | Emma  |
| <i>Culture - Day</i>      | → | Mike  |
| <i>Emperor's birthday</i> | → | Hanna |
- b. \*2 holidays < most students



- (133) Yamada sensei-wa [*Com* hotondo-no gakusee-to] [*Temp* sukunakutomo  
 Yamada teacher-TOP most-GEN student-COM at.least  
 2tu-no saijitsu-ni] zyogingu-shita.  
 2cl-GEN holiday-TEMP jogging-do  
 ‘The teacher Yamada jogs with most of the students on at least two  
 holidays.’



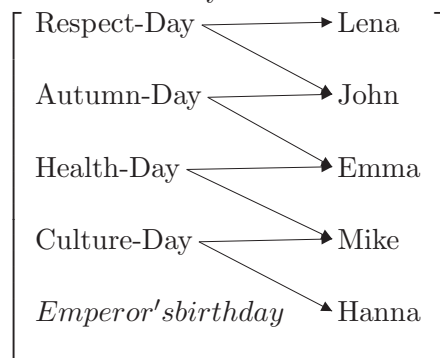


- (135) Yamada sensei-wa [*Temp* 2gakki-no hotondo-no saizitsu-ni]  
 Yamada teacher-TOP 2.semester-GEN most-GEN holiday-TEMP  
 [*Com* sukunakutomo 2 ri-no gakusee-to] zyogingu-shita.  
 at.least 2 cl-GEN student-COM jogging-do  
 ‘The teacher Yamada jogs with at least two students in most of the  
 holidays of the second semester.’

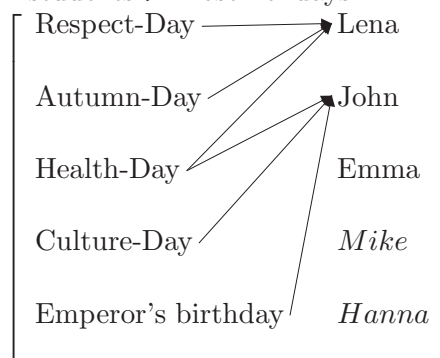
- (136) Context

- a. ‘Holidays’: Respect-for-the-aged day, autumnal equinox day,  
 health-sports day, culture day, and the emperor’s birthday.  
 b. students: Lena, John, Emma, Mike, and Hanna.

- (137) a. OK most holidays > 2 students

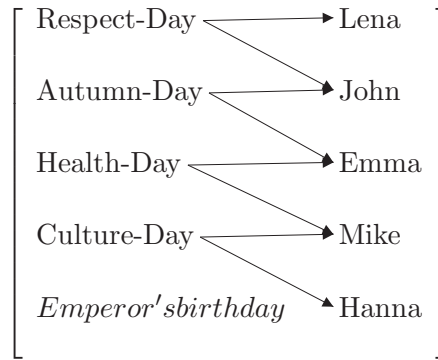


- b. \*2 students > most holidays

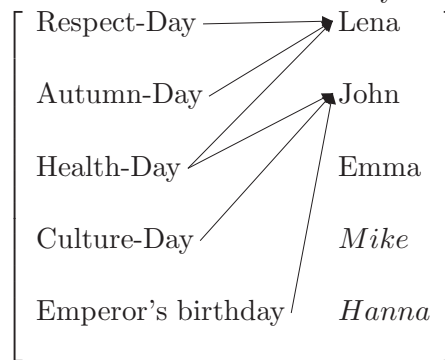


- (138) Yamada sensei-wa [*Com* sukunakutomo 2 ri-no gakusee-to]  
 Yamada teacher-TOP at.least 2 cl-GEN student-COM  
 [*Temp* 2gakki-no hotondo-no saizitsu-ni] zyogingu-shita.  
 2.semester-GEN most-GEN holiday-TEMP jogging-do  
 ‘The teacher Yamada jogs with at least two students in most of the  
 holidays of the second semester.’

- (139) a. OK most holidays > 2 students

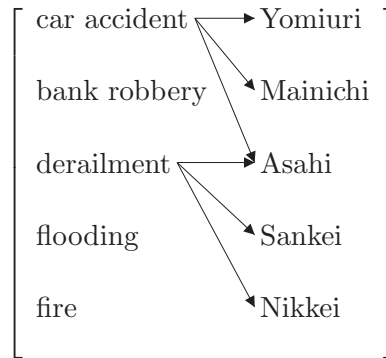


b. OK 2 students > most holidays

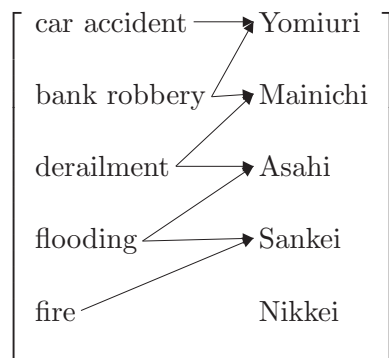


- (140) Kisha-ga [*Source* sukunakutomo 2tsu-no genba-kara] [*Goal*  
 journalist-NOM at.least 2.cl-GEN scene-source  
 hotondo-no shinbunsha-ni] kizi-o sooshin-shita.  
 most-GEN newspaper.company-GOAL article-ACC transmit-did  
 ‘The journalist transmitted an article at least from 2 scenes to most  
 newspaper companies.’

(141) a. 2 Sources > Most goals

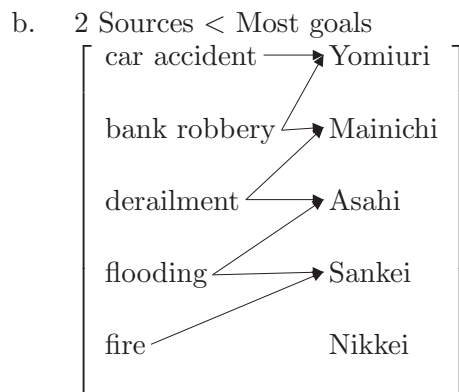
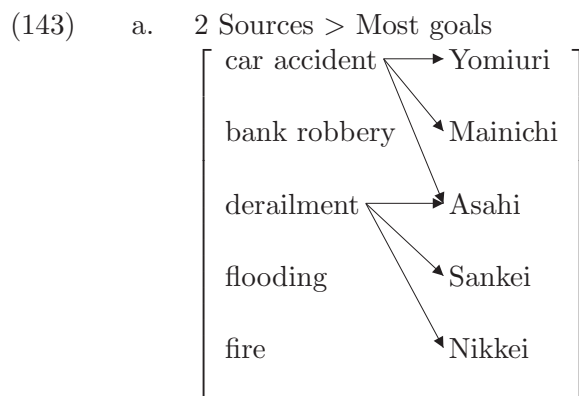


b. 2 Sources < Most goals



### Goal-Source

- (142) Kisha-ga [Goal hotondo-no shinbunsha-ni] [Source  
journalist-NOM most-GEN newspaper.company-GOAL  
sukunakutomo 2tsu-no genba-kara] kizi-o sooshin-shita.  
at.least 2.cl-GEN scene-source article-ACC transmit-did  
'The journalist transmitted an article at least from 2 scenes to most  
newspaper companies.'

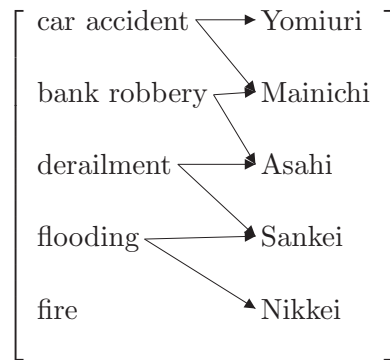


- (144) Kisha-ga [*Source* hotondo-no genba-kara] [*Goal* sukunakutomo  
 journalist-NOM most-GEN scene-source at.least  
 2tsu-no shinbunsha-ni] kizi-o sooshin-shita.  
 2.cl-GEN newspaper.company-GOAL article-ACC transmit-did  
 ‘The journalist transmitted an article from most scenes at least 2  
 newspaper companies.’

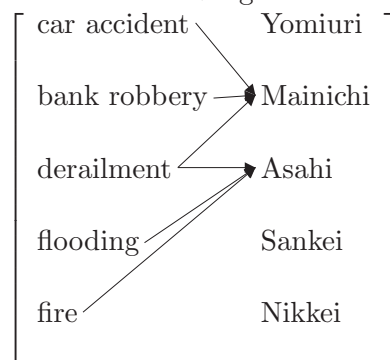
- (145) a. most Sources > 2 goals
- 
- b. most Sources < 2 goals
- 

- (146) Kisha-ga [*Goal* sukunakutomo 2tsu-no shinbunsha-ni]  
 journalist-NOM at.least 2.cl-GEN newspaper.company-GOAL  
 [*Source* hotondo-no genba-kara] kizi-o sooshin-shita.  
 most-GEN scene-source article-ACC transmit-did  
 ‘The journalist transmitted an article from most scenes at least 2  
 newspaper companies.’

- (147) a. most Sources > 2 goals



b. most Sources < 2 goals





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