博士論文

論文題目　　Some Aspects of Disjunction Constructions and Alternative

Questions in English and Japanese

（日英語における選言構造と選択疑問文の諸相）

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Abstract

This thesis focuses on the syntax and semantics of disjunction constructions in (1) (henceforth, the *either/or* construction) and Alternative Questions (AltQs) in (2) in English and Japanese. The aim of this thesis is to investigate and propose syntactic structures and semantic computation of the constructions through comparison of the two languages. In the course of the investigation, the relationship between *dottika/dotti* 'either/which' and *ka* as well as the relationship between *either* and *or* receive special attention.

(1) a. Taro-wa koohii ka kootya-no dottika-o   nonda.

  T-Top   coffee or tea-NO   either-Acc drank

  'Taro drank either coffee or tea.'

  b. Taro drank either coffee or tea.

(2) a. Taro-wa koohii ka kootya-no dotti-o   nomi-masi-ta ka?

  T-Top   coffee or tea-NO   which-Acc drink-Pol-past Q

  'Which did Taro drink: coffee or tea?'

  b. Did Taro drink coffee or tea?

A Disjunction Phrase (DisjP), *A or B* in English and *A ka B (ka)* in Japanese, is present in both constructions. In Japanese, *dottika* 'either' and *dotti* 'which' are similar in their morphological make-up, and the structural connection between the sentences is obvious.

The organization of this thesis is as follows. Chapter 1 provides an overview of previous studies on (1) and (2) and on disjunction and conjunction in general. Chapters 2 and 3 focus on the syntax and semantics of the two constructions in Japanese. Chapter 4 is devoted to a comparison between English and Japanese. Finally, Chapter 5 concludes the thesis.

Chapter 1 introduces previous research on the *either/or* and AltQ constructions and on coordination in general and shows that there is little research on the Japanese versions of these constructions. Previous studies that become especially important in the subsequent

discussion are Schwarz's (1999) ellipsis analysis of the English *either/or* construction, Alonso-Ovalle's (2006) semantic analysis that takes the denotation of *A or B* to be a set of the denotation of the disjuncts, and Winter's (2001) choice function analysis of *or*.

Chapter 2 examines the syntax of the Japanese *either/or* and AltQ constructions in relation to partitives. In partitives in (3), *hondana-ni atta hon* 'books on the bookshelf' and *san-satu* 'three' are connected by *uti-no* 'out of,' and have a part-whole relation.

(3)   Taro-wa [Whole hondana-ni   atta   hon-no]   uti-no   [Part san-satu]-o   yonda.

          T-Top   bookshelf-on were book-NO out-of   three-Cl-Acc read

          'Taro read three of the books on the bookshelf.'

As observed from (4), (1a) and (2a) can make use of *uti-no* 'out of.'

(4) a.   Taro-wa [Whole koohii ka kootya-no] uti-no [Part dottika]-o nonda.

     b.   Taro-wa [Whole koohii ka kootya-no] uti-no [Part dotti]-o nomi-masi-ta ka?

Thus, it is claimed that they are a type of partitive and have a syntactic structure similar to partitives. The structure proposed for (3) is shown in (5), which contains a fully projected Determiner Phrase (DP) each for the part element and the whole element, as well as a Functional Projection (FP) in between the two DPs that marks the part-whole relation.

(5)   Taro-wa [DP [DP hondana-ni   atta hon-no] [FP uti-no] san-satu-o] yonda.

The proposed structure accounts for the possible surface forms of partitive examples in which a noun, a numeral, and a classifier are all overt in both the whole element and the part element and also accounts for the word order data.

The structure proposed for partitives is directly extended to (1a) and (2a). The constructions also allow a surface form in which a noun, a numeral, and a classifier are all overt in both the whole element and the part element, so the constructions are taken to include two full-fledged DPs with a hierarchical structure. One aspect that is different from the analysis of partitives is the position of *dottika* 'either,' which is claimed to modify the numeral inside the Number Phrase. The discussion in this chapter leads to the conclusion that (1a) and (2a) involve a complex hierarchical structure with two DPs and an FP.

Chapter 3 presents a semantic analysis of the Japanese *either/or* and AltQ constructions. A previous analysis by Cable (2010) takes *ka*, used as a Q-particle in *wh* questions and an existential particle in indefinites, as having the semantics of a choice function variable while taking the focus semantic value of the element in its sister node (cf. focus alternative semantics of Rooth (1985)). Choice functions take a set as their argument and return a member of that set. This thesis also adopts Alonso-Ovalle's (2006) analysis that takes the denotation of *A or B* to be a set *{A, B}* and propose an analysis in which an indeterminate expression, *dotti*, has a set of choice functions as its focus semantic value.

According to the proposed analysis, the denotation of *dottika* 'either' is the result of the choice function variable introduced by *ka* taking as its argument the set of choice functions denoted by *dotti*. That is, *dottika* 'either' denotes a choice function, and it takes as its argument the set of disjuncts, which is the denotation of the DisjP. In AltQs, the Q-particle *ka* takes the focus semantic value of the IP, which is a set of propositions including the result of a choice function variable taking as its argument the set of disjuncts and returning one member of the set. With the work of the question operator in the CP domain, the AltQ reading is successfully derived. The Yes/No Question (YNQ) data in (6) can also be explained by positing *dottika* 'either' that can be either overt or covert.

(6)   Taro-wa   koohii   ka   kootya(-no dottika)-o   nomi-masi-ta   ka?

        T-Top   coffee   or   tea-NO   either-Acc   drink-Pol-past   Q

        'Did Taro drink either coffee or tea?'

Chapter 4 turns to the English *either/or* and AltQ constructions and investigates their syntactic and semantic properties by comparing them with the Japanese constructions. An important syntactic property of English *either* observed in previous studies is the possibility of appearing in positions other than its base position adjacent to the DisjP:

(7)   Taro either drank coffee or tea.

Semantically, the distribution of AltQ and YNQ readings is an important difference between English and Japanese. In Japanese, (2a) with *dotti* 'which' is unambiguously an

AltQ, while (6) is unambiguously a YNQ regardless of the presence of overt *dottika* 'either.' In English, (2b) without *either* is ambiguous between an AltQ and a YNQ, while (8) with *either* is unambiguously a YNQ.

(8)   Did Taro drink either coffee or tea?

According to the syntactic analysis, the basic syntactic structure is the same in English as in Japanese, having *either* or *dottika/dotti* 'either/which' adjacent to the DisjP. However, the syntactic category of *either* and *dottika/dotti* 'either/which' and whether ellipsis takes place inside the disjuncts differ between the two languages. These differences lead to a difference in the complexity of the disjunction constructions as well as the possibility of floating of *either* and *dottika* 'either.' According to the semantic analysis, the claim that *either* and a covert *wh* operator in English and *dottika/dotti* 'either/which' in Japanese, all of which introducing choice function variables, have similar semantics explains the wide scope *or* data and AltQ/YNQ data. The distribution of AltQ and YNQ readings seems to be different between the two languages at first glance, but this is attributed to the surface form of the covert *wh* operator in English and *dotti* 'which' in Japanese. *Dotti* 'which,' an item that functionally corresponds to the covert *wh* operator, must be overt in Japanese.

This thesis provides a compositional semantics that derives possible interpretations of the *either/or* and AltQ constructions in English and Japanese, based on the syntactic structure proposed in this thesis. This explanation conforms to the basic assumption adopted in generative grammar that the semantics of a sentence is computed by combining lexical items step by step, following the syntactic structure.

Further, this thesis reveals that, although the constructions under discussion have different surface forms and properties in English and Japanese, the semantic computation that derives the meaning of the sentences is similar. Specifically, the differences between the two languages arise from differences in the lexicon and Narrow Syntax. Thus, this thesis contributes to the research of generative grammar by presenting an example of universality in the semantic component and variation in the lexicon and Narrow Syntax.

List of Abbreviations

Acc	Accusative
C	Complementizer
Cl	Classifier
Con	Conjunctive form
Cop	Copula
Disj	Disjunction marker
Gen	Genitive
Lin	Linker
Loc	Locative
Neg	Negation
Nmnl	Nominalizer
Nom	Nominative
Obj	Object
Pl	Plural
Pol	Polite form
Q	Question particle
SFP	Sentence-final particle
Sg	Singular
Top	Topic
1	First person

x

Chapter 1

Introduction

1.   General Introduction

This thesis investigates the syntax and semantics of constructions involving disjunction structure in Japanese and English. Specifically, it focuses on constructions involving *dottika* 'either' and *either* in (1) and Alternative Questions (AltQs) in (2), both of which involve a disjunction structure *A ka B* 'A or B' and *A or B*. In (1), a disjunction structure is in a declarative sentence, while in (2), it is in an interrogative sentence.

(1) a.   Taro-ga koohii ka kootya-no dottika-o   nonda.

      T-Nom   coffee or   tea-NO   either-Acc drank

      'Taro drank either coffee or tea.'

   b.   Taro drank either coffee or tea.

(2) a.   Taro-ga   koohii ka kootya-no dotti-o   nomi-masi-ta ka?

      T-Nom   coffee or   tea-NO   which-Acc drink-Pol-past Q

      'Which did Taro drink: coffee or tea?'

   b.   Did Taro drink coffee or tea?

In Japanese, the two constructions use the items *dottika* 'either' and *dotti* 'which,' which are based on an indeterminate expression *dotti* and are morphologically similar.

Interestingly, there are multiple possible forms for sentences in (1) and (2), and the interpretations change accordingly. Considering constructions involving *dottika* 'either' and *either* in (1), the examples are acceptable without *dottika* 'either' and *either*, as indicated in (3). In English, *either* can also appear in various positions as illustrated in (4).

1

(3) a. Taro-ga koohii ka kootya-o nonda.

    T-Nom   coffee or tea-Acc drank

    'Taro drank coffee or tea.'

  b. Taro drank coffee or tea.

(4) a. Taro drank either coffee or tea. (= (1b))   (cf. Larson (1985))

  b. Taro either drank coffee or tea.

  c. Either Taro drank coffee or tea.

The sentences in (3) do not demonstrate any peculiar behavior different from the corresponding sentences in (1). There are, however, some differences between Japanese and English. First, the phenomenon in (4) is not observed in Japanese. Examples in (5) show that *dottika* 'either' cannot appear in positions where *either* is allowed.

(5) a. * Taro-ga koohii ka kootya-o nonda dottika(-o).

  b. * Taro-ga dottika(-o) koohii ka kootya-o nonda.

  c. * Dottika(-o) Taro-ga koohii ka kootya-o nonda.

Another difference between Japanese and English regarding constructions involving *dottika* 'either' and *either* is found with the possible interpretations of the sentence. In English, it has been reported that *either/or* construction examples with an intensional predicate and an indefinite are ambiguous (cf. Rooth and Partee (1982), Larson (1985)). The readings that are the most relevant to the current discussion are described in (6).

(6) a. Mary is looking for a maid or a cook.

  b. Mary is looking for either a maid or a cook.

  A. Mary does not have a specific maid or cook in mind, and she would be satisfied by finding either of the two.

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B. Mary does not have a specific maid or cook in mind, but she has already decided which of the two types of employee she will look for.

Sentences (6a) and (6b), with no *either* or *either* in a position adjacent to the disjunction structure (which is generally assumed to be its base position), respectively, can have a reading in (6A), in which finding either a maid or a cook would satisfy Mary, and (6B), in which finding only one of the employees would satisfy Mary. In contrast, in (7), in which *either* is in positions other than its base position, only the second reading in (7B) is available.

(7) a. Mary is either looking for a maid or a cook.

    b. Mary either is looking for a maid or a cook.

    c. Either Mary is looking for a maid or a cook.

    A.* Mary does not have a specific maid or cook in mind, and she would be satisfied by finding either of the two.

    B. Mary does not have a specific maid or cook in mind, but she has already decided which of the two types of employee she will look for.

In Japanese, *dottika* 'either' can only appear in a position adjacent to the disjunction structure, as observed above; thus, the sentences in (8), which correspond to those in (6), are the only possible forms. They have both of the readings in (8A,B).

(8) a. Taro-ga meido ka kokku-no dottika-o sagasiteiru.

      T-Nom maid or cook-NO either-Acc looking.for

      'Taro is looking for either a maid or a cook.'

    b. Taro-ga meido ka kokku-o sagasiteiru.

A. Taro does not have a specific maid or cook in mind, and he would be satisfied by finding either of the two.

B. Taro does not have a specific maid or cook in mind, but he has already decided which of the two types of employee he will look for.

Thus far, we have seen that in constructions involving *dottika* 'either' and *either*, there are multiple possible positions for *either* but not for *dottika* 'either' and that the available readings differ in accordance with the positions of *dottika* 'either' and *either*. Questions that naturally arise are as follows: why are the possible positions different for *dottika* 'either' and *either*, and why are there multiple interpretations for the various forms of the sentences?

Next, let us examine AltQs. Japanese AltQs also have the possible forms described in (9a,b), with and without *dotti* 'which.' In an English AltQ repeated in (2b), there is no overt item corresponding to *dotti* 'which.' Consider, then, the possible interpretations. (2b) can be used as an AltQ and as a Yes/No Question (YNQ), which means that there are two possible answers for the question: "Rice" for an AltQ and "Yes" for a YNQ. These two interpretations are distinguished by intonation (Pruitt and Roelofsen (2013), among others). The Japanese examples, however, are unambiguous. (9a) with *dotti* 'which' can only be an AltQ, while (9b) without *dotti* 'which' can only be a YNQ. Thus, there is variation between Japanese and English in the surface form and the possible interpretations.

(9) a. Taro-ga   koohii ka kootya-no dotti-o   nomi-masi-ta ka? (AltQ/*YNQ)
       T-Nom   coffee or tea-NO   which-Acc drink-Pol-past Q
       'Which did Taro drink: coffee or tea?'

    b. Taro-ga   koohii ka kootya-o nomi-masi-ta   ka? (*AltQ/YNQ)
       T-Nom   coffee or tea-Acc   drink-Pol-past Q
       'Did Taro drink coffee or tea?'

(2) b.   Did Taro drink coffee or tea?(AltQ/YNQ)

There is yet another possible form for interrogatives: turning constructions involving *dottika* 'either' and *either* in (1a,b) into questions. The result is shown in (10). Both sentences have only a YNQ reading.

(10) a.   Taro-ga koohii ka kootya-no dottika-o   nomi-masi-ta ka? (*AltQ/YNQ)

T-Nom coffee or tea-NO   either-Acc drink-Pol-past Q

'Did Taro drink either coffee or tea?'

   b.   Did Taro drink either coffee or tea?   (*AltQ/YNQ)

Considering the AltQ/YNQ data introduced above, a question that needs to be answered is as follows: why are the surface forms and the interpretations different between Japanese and English?

   To investigate the questions set forth above, this thesis pays particular attention to the syntactic and semantic relation between the disjunction structure and *dottika/dotti* 'either/which' and *either* and the mapping of the syntactic structure to the semantics of the disjunction structure. Syntactic and semantic research on the English constructions is relatively abundant, but few studies have examined their Japanese counterparts, as will be reviewed later. Thus, the Japanese constructions need to be examined first before we compare the two languages. The central focus of this thesis will be on Japanese data, and it is also examined whether Japanese data can be accounted for with the same analysis proposed for English. The main questions discussed are the following:

(11) a.   In the Japanese examples, how are *A ka B* 'A or B' and *dottika/dotti* 'either/which' syntactically analyzed?

   b.   How are *A ka B* 'A or B' and *dottika/dotti* 'either/which,' with the syntactic

structure revealed in (11a), semantically computed and how are the possible interpretations derived?

    c.   What different syntactic and semantic properties are observed for the Japanese and English constructions?

    d.   How can we account for the properties in (11c)?

We will begin by examining the syntactic structure of the Japanese constructions and will then proceed to inspect the semantics. This inspection is grounded on the assumption of generative grammar that the semantics of a sentence is computed based on the syntactic structure. As seen from the questions in (11), this thesis primarily investigates the relationship between the disjunction structure and *dottika/dotti* 'either/which' and *either* and not disjunction itself, although disjunction occupies an important syntactic and semantic role in the constructions. Thus, when introducing previous research on constructions involving *dottika* 'either' and *either* and AltQs in the following sections, previous research on disjunction is also referred to, but the review is not intended to be comprehensive. The rest of this section is devoted to a brief introduction to coordination, which is a notion that includes disjunction as a subtype, and the characteristics of coordination in English and Japanese.

Coordination is a fundamental linguistic construction assumed to be present universally, regardless of whether the lexical item with the grammatical function is phonetically realized or not. According to Haspelmath (2007: 1), coordination is defined as "syntactic constructions in which two or more units of the same type are combined into a larger unit and still have the same semantic relations with other surrounding elements." This description can be understood by considering (12). The examples provided in (12) are two primary subtypes of coordination: conjunction in (12a) and disjunction in (12b).

(12) a.   Snow White ate **and** drank.

b.   She was a countess **or** a princess.   (Haspelmath (2007: 2))

As shown in the examples in (12), the two elements combined by *and* or *or* are "of the same type." Two verbs are combined in (12a) and two Noun Phrases (NPs) or Determiner Phrases (DPs) in (12b). Here, we need to clarify under what conditions combined elements are "of the same type." This will be discussed in further detail in Section 2.1.

Moreover, the combined elements in (12) can be used individually, as in (13).

(13) a.   Snow White ate./Snow White drank.

    b.   She was a countess./She was a princess.

This capacity means that each of the combined elements has the same function as the coordination structure in a sentence. More specifically, the conjunction structure *ate and drank* has the same function in the sentence as *ate* and *drank* do separately, and the disjunction structure *a countess or a princess* has the same function in the sentence as *a countess* and *a princess* do separately. What counts as the "same function," however, is open to debate, as will be discussed later.

Some terminology is introduced before we move on. An item that combines elements in coordination is called a *coordinator*. Elements combined in coordination are called *coordinands*; specifically, *conjuncts* in conjunction and *disjuncts* in disjunction. Conjuncts/disjuncts are occasionally referred to as *XP-conjunctives/disjunctives*, with XP replaced with the name of the projection of the conjuncts/disjuncts. Thus, *ate* and *drank* in (12a) are referred to as *conjuncts* or *VP-conjunctives*, and *a countess* and *a princess* in (12b) are referred to as *disjuncts* or *NP/DP-disjunctives*.

Japanese and English are compared in this thesis because the two languages exhibit different patterns of coordination, at least in surface form. The languages of the world exhibit various types of coordinators, some of which are extracted from Haspelmath (2007)

as follows:

(14) a.   A B   (asyndetic)

    b.   A co-B   (monosyndetic)

    c.   (i) co-A co-B   (ii) A-co B-co   (bisyndetic)   (Haspelmath (2007: 6))

Examples of asyndetic coordination in English and Maricopa are given in (15), in which no overt coordinator is present. Asyndetic coordination often has a meaning of conjunction.

(15) a.   Slowly, stealthily, she crept towards her victim.   (Haspelmath (2007: 7))

    b.   John   Bill   ñi-ʔ-yuu-k   (Maricopa)

       John(Acc) Bill(Acc)   Pl.Obj-1-see.Sg-Realis

       'I saw John and Bill.'   (Gil (1991: 99), as cited in Haspelmath (2007: 7))

The English *and* and *or* are examples of monosyndetic coordination with a single coordinator in which the coordinator forms a constituent with the coordinand following it, as in (14b), according to Haspelmath (2007). Haspelmath (2007) provides several pieces of evidence for this, among which are intonation in (16a) and discontinuous order in (16b).

(16) a.   Joan, and Marvin, and their baby

    cf.* Joan and, Marvin and, their baby

    b.   My uncle will come tomorrow, or my aunt

    cf.* My uncle or will come tomorrow, my aunt   (Haspelmath (2007: 8))

As in (16a), intonation breaks represented by commas can be inserted between *and* and its preceding phrase but not between *and* and its following phrase. (16b) shows that, in the afterthoughts, the first coordinand can be separated from the second one, but the

coordinator has to be adjacent to the second coordinand.

In contrast, Japanese has bisyndetic coordination in (14c), in which there are two coordinators. As the conjunction example in (17a) and the disjunction example in (17b) show, bisyndetic coordination in Japanese demonstrates the pattern in (14cii) with the coordinator following the coordinands.

(17) a. Taro-ga   Jiro-to   Hanako(-to)-o mita.

　　　 T-Nom   J-and   H-and-Acc   saw

　　　 'Taro saw Jiro and Hanako.'

　 b. Taro-ga   Jiro-ka   Hanako(-ka)-o mita.

　　　 T-Nom   J-or   H-or-Acc   saw

　　　 'Taro saw Jiro or Hanako.'

French and Russian have bisyndetic coordination of the pattern in (14ci), although the translations of the examples (18a,b) indicate that the first coordinator might have a different status from the second coordinator, corresponding to the item *both* in English.

(18) a. (et) Jean et Marie (French)

　　　 '(both) Jean and Marie'

　 b. (i) Nina i Miša (Russian)

　　　 '(both) Nina and Misha'　　　　　　　　　　　　　　(Haspelmath (2007: 11, 16))

As will be reviewed in Section 2.1., the various patterns of coordinators described above have led to debate on the syntactic structure within coordination (cf. Chino and Hiraiwa (2014)). Comparing Japanese and English, two languages that show different syntactic patterns of coordination, will shed light on the nature of coordination.

The subsequent discussion mainly focuses on disjunction and introduces examples

with disjunction, leaving aside conjunction except for contexts where it is explicitly referred to. Note, however, that most of the discussion on disjunction can be extended to conjunction.

The rest of this chapter is structured as follows. Sections 2 and 3 review some syntactic and semantic research on disjunction in general and the *either/or* construction specifically, and then turn to AltQs to provide background knowledge on the constructions. Analyses that will be particularly important for the discussion in subsequent chapters are an ellipsis analysis of the *either/or* construction and AltQs (reviewed in Sections 2.1 and 3.1), a semantics of the disjunction structure *A or B* as denoting a set containing *A* and *B* (reviewed in Section 2.2), and a choice function analysis of *or* (reviewed in Section 2.2). The overview in Sections 2 and 3 will also illustrate that there is little research on the Japanese constructions. In Section 4, the theoretical framework assumed in this thesis is briefly explained. Section 5 provides an overview of the thesis.

2. Research on Disjunction Constructions

2.1. Syntax

In the early years of generative grammar, much of the research on the syntax of coordination centered on a restriction that only allows coordinands that have parallel status. This restriction is equivalent to the characteristic of coordination introduced above, namely, each of the combined elements having the same function as the coordination structure in a sentence. What counts as the "same function," however, has not been agreed upon among researchers. For instance, Chomsky (1957) states that if coordinands *X* and *Y* appear in the same position of two grammatical sentences and are constituents of the same type, it is possible to construct a new grammatical sentence with a coordination *X and Y* replacing *X* or *Y* in the original sentence. This process can be understood from the following examples:

(19) a.   The scene of the movie and of the play was in Chicago.

b. * The scene of the movie and that I wrote was in Chicago. (Chomsky (1957: 35-36))

(19a) is acceptable, since *of the movie* and *of the play* are constituents of the same type, while (19b) is not acceptable, since *of the movie* and *that I wrote* are not of the same type. This rule, dubbed the Law of Coordination of Likes, states that coordinands must have the same syntactic properties, including, for example, syntactic category and syntactic feature values (cf. Williams (1978, 1981), Gazdar (1981), Pullum and Zwicky (1986)).

Some researchers have argued that a syntactic description of the rule is insufficient. Sag et al. (1985) and Schachter (1977) provide the examples in (20). Sentences in (20a-c) are examples of coordination with coordinands of distinct syntactic categories, and (20d) shows that coordinands being of an identical syntactic category is not a sufficient condition for constructing a grammatical sentence.

(20) a.　Pat is either stupid or a liar. (AP *or* NP)

　　b.　Sandy is either a lunatic or under the influence of drugs. (NP *or* PP)

　　c.　I am neither an authority on this subject nor trying to portray myself as one.

(NP *nor* VP)　(Sag et al. (1985: 117-118))

　　d. * John ate with his mother and with good appetite.　　(Schachter (1977: 89))

Data such as (20) have led researchers to include some semantic descriptions in the restriction. For example, coordinands need to have the same semantic function (e.g., a question, a command) or the same semantic type (e.g., [+ MANNER], [+TEMPORAL]) (cf. Schachter (1977), Sag et al. (1985)).

While the parallel status of coordinands has attracted considerable attention, the syntactic structure of coordination itself was not seriously investigated in the early years of generative grammar. It was often assumed that coordination simply has a flat structure, as in (21).

11

(21)　　Flat structure of coordination (cf. Postal (1964))

A　　*and/or*　　B
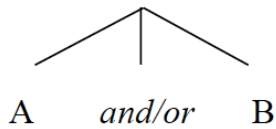
Subsequent research on the syntactic properties of coordination led some researchers to conclude that coordination has a binary-branching structure, as in (22), just as projections of other categories do.

(22)　　Binary-branching structure of coordination

A

and/or　　B
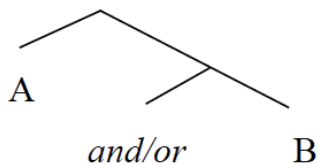
Kayne (1994), for instance, defends a binary structure of coordination, building on his Linear Correspondence Axiom (LCA). Since the LCA requires that an element preceding another element asymmetrically c-command it, there needs to be a binary-branching structure inside coordination (and inside the coordinands *A* and *B* too). Munn (1993) also claims that coordinators head a Boolean Phrase (BP) projection with a binary-branching structure. To support his claim, he provides some binding facts, as shown in (23).

(23) a.　John$_i$'s dog and he$_i$/him$_i$ went for a walk.

　　b. *　He$_i$ and John$_i$'s dog went for a walk.　　　　　　　　　(Munn (1993: 16))

The contrast between (23a) and (23b) suggests that the first conjunct asymmetrically c-commands the second conjunct. Munn (1993) ultimately argues for a structure like (24), in which a BP is adjoined to a projection of the first conjunct, based on arguments for using m-command instead of c-command.

(24)   Munn's (1993: 13) structure of BP

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              NP
            /    \
         NP       BP
                 /    \
               B       NP
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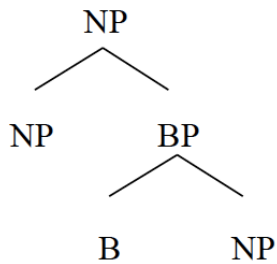
Johannessen (1998) offers evidence for coordinators being phrase heads and proposes that they project a phrase structured in accordance with the X-bar schema. The structure of coordination, a Conjunction Phrase with two conjuncts X and Y, is shown in (25a) for head-initial languages and in (25b) for head-final languages.

(25)   a. Coordination in head-initial languages   b. Coordination in head-final languages

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           CoP                                  CoP
         /     \                              /     \
        X       Co′                         Co′      X
               /    \                      /    \
             Co      Y                    Y      Co
```
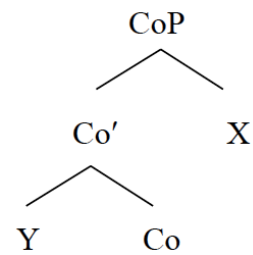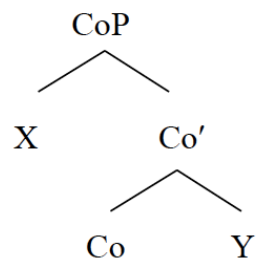
(Johannessen (1998: 109))

In structure (25b), the specifier *X* occupies a position to the right of the head, but this structure does not fit other structures found in the language because in head-final languages, specifiers are in a left branch, yielding a specifier-complement-head order. Johannessen (1998) suggests that this characteristic might follow from the LCA, which requires that the specifier and the complement be on the opposite sides of the head.

As reviewed so far, Kayne (1994), Munn (1993), and Johannessen (1998) all propose the idea that there is a binary-branching projection related to coordination, and some of them further claim that the coordinator heads this projection. The idea that coordination has a binary structure has the advantage of aligning with the X-bar theory; however, the

idea that the coordinator heads the projection leads to complications when we consider examples of bisyndetic coordination in (17) and (18).

(17) a. Taro-ga   Jiro-to   Hanako(-to)-o mita. (Japanese)

      T-Nom   J-and   H-and-Acc   saw

      'Taro saw Jiro and Hanako.'

   b. Taro-ga   Jiro-ka   Hanako(-ka)-o   mita.

      T-Nom   J-or   H-or-Acc   saw

      'Taro saw Jiro or Hanako.'

(18) a. (et) Jean et Marie (French)

      '(both) Jean and Marie'

   b. (i) Nina i Miša (Russian)

      '(both) Nina and Misha'   (Haspelmath (2007: 11, 16))

While English examples are easily accommodated into the X-bar structure of coordination in which the coordinator heads the phrase, examples in (17) and (18) are not, since there are two coordinators. The situation becomes even more complicated when we consider the conjecture in (26) by Kayne (1994).[1]

(26) a. The pattern '*and* DP *and* DP' occurs only in languages whose heads normally or largely precede their complements.

   b. The pattern 'DP *and* DP *and*' occurs only in languages whose heads normally or largely come to be preceded by their complements.   (Kayne (1994: 58))

---

[1] Zwart (2005) conducted a survey on head-final and head-initial languages with monosyndetic coordination and reports that head-final languages strongly favor initial conjunctions in (ia).
(i) a. A & B (initial monosyndetic coordination)
   b. A B & (final monosyndetic coordination)

(26a) corresponds to (18) and (26b) to (17). It thus seems that the order of the coordinator and its complement in a language matches the order of the head and the complement in that language, suggesting that the coordinator has the status of a head but that that head is not the head of the entire coordinated phrase.

Bisyndetic coordination data can be accommodated in the claim by Jayaseelan (2014) and Mitrović and Sauerland (2016), among others, that there are two operators/morphemes involved in coordination. According to Mitrović and Sauerland (2016), for example, languages are classified into those with an overt μ head, such as the Japanese *mo*, and those with an overt J(unction) head, such as the English *and*. *Bill mo Mary mo* 'Bill and Mary' in Japanese has the decomposed structure in (27).

(27)   Structure of *Bill mo Mary mo* 'Bill and Mary'

```
                    JP
              _____|_____
            μP           |
          __|__        J⁰        μP
        XP    μ⁰        |       __|__
        |     |     (silent)  YP    μ⁰
       Bill   mo             |      |
                            Mary    mo
```
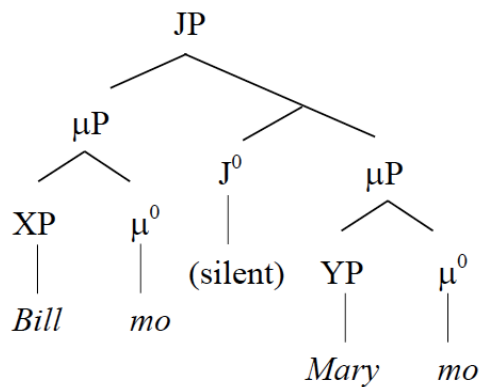
(Mitrović and Sauerland (2016: 477))

A μ head combines with an argument of type *e*, while a J head combines arguments of type *t*. In Chapters 2 and 4, the two-layered structure is adopted for both Japanese and English disjunction.

Let us now turn to previous research on the English *either/or* construction, paying close attention to the syntactic status of *either*. Den Dikken (2006) claims that both *either* and *or* are phrasal elements, rather than heads, and that a distinct functional category Junction (J) heads a Junction Phrase (JP), as in (28).

(28)   Structure of a J(unction) Phrase (cf. Den Dikken (2006: 740))
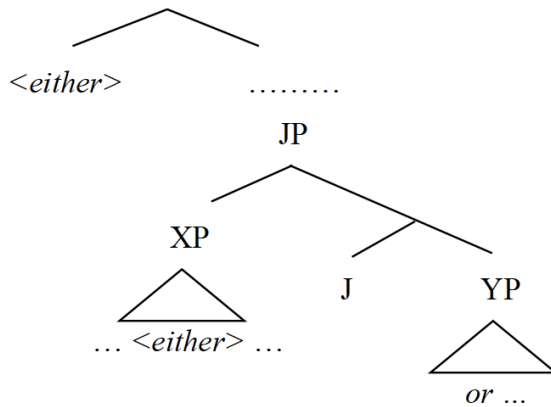
Either and *or* are inside two disjuncts XP and YP, which are in the specifier position and the complement position of JP. There are multiple possible positions for *either*, indicated by angled brackets on *either*, including positions outside JP. (This phenomenon of *either*-floating is examined in detail in Chapter 4.) In English, the J head is always covert. Den Dikken (2006) also suggests that, in line with previous studies ((Munn (1993), among others), *either* is a quantifier rather than a particle and can indeed directly modify NPs as a quantifier, as in (29).

(29)   [Either analysis] will yield the desired result.   (Den Dikken (2006: 742))

Other studies on the *either/or* construction account for data in which *either* can be in multiple positions and propose a movement analysis, as in (30) (Larson (1985)), or an ellipsis analysis, as in (31) (Schwarz (1999)). (Strikethrough indicates deletion.)

(30)   **Either$_i$/Op** Mary **either$_i$/Op** is **either$_i$/Op** looking for [$_{XP}$ **t$_i$** a maid or a cook].

(31) a.   John either ate rice or beans.

John either [$_{VP}$ ate rice] or [$_{VP}$ ~~ate~~ beans]

b.   Either John ate rice or beans

16

Either [$_{\text{IP}}$ John ate rice] or [$_{\text{IP}}$ ~~John ate~~ beans]   (Schwarz (1999: 351-352))

Larson (1985) defends his analysis by providing evidence that shows that the surface position of *either* marks the scope position of *or*. Schwarz (1999) claims that an unbalanced disjunction, in which the surface size of the disjuncts is not the same as in (31a,b), is derived from balanced disjunction through ellipsis in the second disjunct.

According to Schwarz (1999), the ellipsis operation involved in the derivation of unbalanced disjunction (31) is Gapping (32).

(32)   Tom has a pistol and Dick ~~has~~ a sword.

As supporting evidence, he illustrates several commonalities between Gapping and unbalanced disjunction. For example, Gapping always targets the finite verb of the second conjunct, and sometimes extra material too, including subjects, as in (33). This behavior parallels unbalanced disjunction data in (31).

(33)   On Monday I bought a car and on Tuesday ~~I bought~~ a motorcycle.

(Schwarz (1999: 354))

The plausibility of the movement analysis and the ellipsis analysis considering English data, and the possibility of extending them to Japanese, are discussed in Chapter 4. It is claimed in Chapter 4 that while the ellipsis analysis accounts for the English data, it accounts for only some of the Japanese data, and that the movement of *either* or *dottika* 'either' does not take place in either language.

2.2. Semantics

Disjunction, along with conjunction, has been subject to considerable semantic

research. In predicate logic, *or* is a connective that connects two propositions, each of them having its own truth value. The truth value of a proposition *p or q*, for example, is determined by the truth table in (34).

(34)   Truth table for disjunction ($\vee$) (Partee et al. (1993: 101))

p	q	p $\vee$ q
1	1	1
1	0	1
0	1	1
0	0	0

Disjunction is a logical connective with an inclusive interpretation, in which *p or q* is true when at least one of the two propositions it connects is true.

Alternatively, in Boolean algebra, the logical connective $\vee$ corresponds to a set-theoretic union ($\cup$). In (35), an individual *Roger* is a member of a predicate denotation (taken to be a set of individuals) which is a union of the denotation of two predicates, *in the kitchen* and *in the bathroom*.

(35) a.   Roger is [in the kitchen] or [in the bathroom].

 b.   Roger$'$ $\in$ [[[in_kitchen$'$]] $\cup$ [[in_bathroom$'$]]]   (Zamparelli (2011: 1729))

If Montague semantics and generalized disjunction in (36) by Partee and Rooth (1983) are adopted, example (37a) has the denotation in (37b).

(36) $\sqcup_{<\tau, <\tau,\tau>>} = \begin{cases} \vee_{<t, <t,t>>} & \text{if } \tau = t \\ \lambda X_\tau.\lambda Y_\tau.\lambda Z_{\sigma 1}.X(Z) \sqcup_{<\sigma 2, <\sigma 2, \sigma 2>} Y(Z) & \text{if } \tau = \sigma_1\sigma_2 \end{cases}$

(Winter (2001: 23))

(37) a.　Martha or Roger will pick you up.

　　b.　pick_you_up′ ∈ [λP.P(Martha′) ∪ λQ.Q(Roger′)] (Zamparelli (2011: 1729-1930))

In (37b), proper nouns are generalized quantifiers, denoting sets of predicates, and the predicate "pick_you_up" denotes a member of the union of the sets denoted by the two names.

　　The idea that disjunction denotes set-theoretic union is attractive, but some researchers have proposed analyses that assign to disjunction semantic denotations other than Boolean disjunction. According to one such analysis, *or* forms a set of the disjunct denotations. Alonso-Ovalle (2006), for example, proposes resorting to a Hamblin-type (1973) alternative semantics for *or* to account for an exclusive reading of *or* in (38), following Aloni (2003) and Simons (2005).

(38)　　Sandy is reading Moby Dick, Huckleberry Finn or Treasure Island.

(Alonso-Ovalle (2006: 57))

Or in (38) is usually understood exclusively, implying that Sandy is reading only one of the three books. Deriving this exclusive component is difficult for an analysis that assigns to *or* a logical connective meaning ∨. The problem, which dates back to Reichenbach (1947), becomes clear when we try to represent the disjunction in (38) with an "exclusive disjunction" ⊻. ⊻, an exclusive version of ∨, is a binary connective that combines two propositions, giving two possible structures in (39). (*MD*, *HF*, and *TI* stand for propositions *Sandy is reading Moby Dick, Sandy is reading Huckleberry Finn* and *Sandy is reading Treasure Island*, respectively.)

(39) a.　(MD ⊻ HF) ⊻ TI

　　b.　MD ⊻ (HF ⊻ TI)

When $\underline{\vee}$ combines two propositions *A* and *B*, $A \underline{\vee} B$ is true when only one of *A* or *B* is true.

Neither (39a) nor (39b) conveys the exclusive meaning that (38) has, since both of the representations are true when Sandy is reading all three books. For instance, consider *(MD $\underline{\vee}$ HF) $\underline{\vee}$ TI*. When Sandy is reading both Moby Dick and Huckleberry Finn, *MD $\underline{\vee}$ HF* is false, since it is not the case that Sandy is reading only one of the two books. Since *MD $\underline{\vee}$ HF* is false, for *(MD $\underline{\vee}$ HF) $\underline{\vee}$ TI* to be true, *TI* has to be true. Thus, when Sandy is reading Moby Dick, Huckleberry Finn, and Treasure Island, (39a) is true. This situation, however, does not make (38) true.

To overcome this problem, Alonso-Ovalle (2006) proposes a semantics of *or* that employs a Hamblin-type (1973) alternative semantics in (40).

(40)   The *or* rule (Alonso-Ovalle (2006: 11))

Where $[\![$ B $]\!]$, $[\![$ C $]\!] \subseteq D_\tau$, $\left[\!\!\left[\begin{array}{c} A \\ \wedge \\ \vert \\ \text{B \quad or \quad C} \end{array} \right]\!\!\right] \subseteq D_\tau = [\![$ B $]\!] \cup [\![$ C $]\!]$

According to a Hamblin-type alternative semantics, lexical items denote singleton sets containing their standard denotation. Thus, *Sandy* denotes a singleton set of an individual, *{Sandy}*, and *read* denotes a singleton set of a property, *{λy. λx. λw. read(y)(x)(w)}*. With the rule in (40), *Moby Dick or Huckleberry Finn* is the union of two singleton sets *{Moby Dick}* and *{Huckleberry Finn}*, which equals the set *{Moby Dick, Huckleberry Finn}*.

Alonso-Ovalle (2006) claims that the exclusive meaning of *or* in (38) is derived with a function $[\![\bullet]\!]_{\text{ALT}_\cap}$ in (41) and a notion called innocent exclusion (following Sauerland (2004) and Fox (2007)) in (42).

(41)   For any sentence *S*, $[\![$ S $]\!]_{\text{ALT}_\cap} = \{p \mid \exists \mathcal{B} [\mathcal{B} \in \wp([\![$ S $]\!]) \text{ \& } \mathcal{B} \neq \varnothing \text{ \& } p = \cap \mathcal{B}]\}$

(Alonso-Ovalle (2006: 81))

(42)   The negation of a proposition p in the set of competitors of a sentence S ($[\![$ S $]\!]_{\text{ALT}_\cap}$)

is innocent if and only if, for each $q \in [\![$ S $]\!]$, every way of adding to q as many

negations of propositions in $[\![$ S $]\!]_{\text{ALT}_\cap}$ as consistency allows reaches a point where

the resulting set implies $\neg p$.   (Alonso-Ovalle (2006: 81-82))

$[\![$ • $]\!]_{\text{ALT}_\cap}$ in (41) generates a set of propositions p that are true in a world w if and only if

all nonempty propositions in the power set of the denotation of S are true. This derives (43)

for sentence (38). Based on the *or* rule in (40), the denotation of (38) is *{MD, HF, TI}*.

Negations of propositions in $[\![$ (38) $]\!]_{\text{ALT}_\cap}$ that are innocently excluded are included in the

set in (44). The exclusive component of (38) is thus derived.

(43) $[\![$ (38)$]\!]_{\text{ALT}_\cap}$ =
$$\left\{ \begin{array}{c} \text{MD, HF, TI,} \\ \text{MD \& HF, HF \& TI, MD \& TI,} \\ \text{MD \& HF \& TI} \end{array} \right\}$$

(cf. Alonso-Ovalle (2006: 81))

(44)   {¬(MD & HF), ¬(HF & TI), ¬(MD & TI), ¬(MD & HF & TI)}

(cf. Alonso-Ovalle (2006: 83))

Another attempt to analyze the semantics of disjunction is made by Winter (2001),

who claims that *or* introduces a choice function variable. A choice function variable takes

a set as its argument and returns a member of the set, and it has been employed in Reinhart

(1997) and Winter (1997) among others to account for certain interpretations of *wh*

questions and indefinites.

Winter (2001) claims that a choice function analysis of disjunction accounts for a wide

scope reading of *or* that a sentence with disjunction has. For example, sentence (45) has a

narrow scope *or* reading in (45a) and a wide scope *or* reading in (45b).

(45)   If Bill praises Mary or Sue then John will be happy.   (Winter (2000: 403))

   a.   If Bill praises Mary then John will be happy and if Bill praises Sue then John will

      be happy.   (Narrow Scope)

   b.   If Bill praises Mary then John will be happy or if Bill praises Sue then John will

      be happy.   (Wide Scope)

Winter (2001) shows that the wide scope *or* reading is obtained through existential closure

of the choice function variable that the disjunction introduces, as in (46).[2]

(46) $\exists f\,[\text{CH}(f) \wedge [\langle f \rangle^d\,(\min\,(M \sqcup S))\,(\lambda x.\,\text{praise}'\,(x)\,(b') \rightarrow \text{happy}'\,(j')]]$

$= \exists f\,[\text{CH}(f) \wedge [\langle f \rangle^d\,(\{\{m'\},\,\{s'\}\})\,(\lambda x.\,\text{praise}'\,(x)\,(b') \rightarrow \text{happy}'\,(j')]]$

$= \exists A \in \{\{m'\},\,\{s'\}\}\,[(\lambda P.\,A \subseteq P)\,(\lambda x.\,\text{praise}'\,(x)\,(b') \rightarrow \text{happy}'\,(j'))]$

$= [\text{praise}'\,(m')\,(b') \rightarrow \text{happy}'\,(j')] \vee [\text{praise}'\,(s')\,(b') \rightarrow \text{happy}'\,(j')]$

(Winter (2001: 159))

    In Chapters 3 and 4, where the semantics of the *either/or* and AltQ constructions in

Japanese and English are discussed, Alonso-Ovalle's (2006) analysis in which a disjunction

structure denotes a set of disjunct denotations is adopted. That analysis is combined with

one that assigns a semantic role of choice function to *dottika/dotti* 'either/which,' *either*,

and a *wh* operator that exists in AltQs, and it is demonstrated that the combined analysis

---

[2] The notations in capital letters *M* and *S* are the quantifiers corresponding to the proper names *Mary* and *Sue*, respectively (and thus can be combined using Generalized Disjunction) and the notations *m′* and *s′* are the lexical denotations of *Mary* and *Sue*, respectively. The definition of Minimum Sort is in (i). An operator *min* takes *Q*, a set of objects of type τ (which is a Boolean type) and gives back a set of minimal sets of *Q*, where a set *A* is a minimal set of *Q* iff *A* is in *Q*, and every proper subset of *A* is not in *Q*. Thus, *A* is a set of the generator of the principal filter *Q*.
(i) $\min = \lambda Q_{\tau t}.\,\lambda A_{\tau}.\,Q(A) \wedge \forall B \in Q\,[B \subseteq A \rightarrow B = A]$ (Winter (2001: 53))
$\langle f \rangle^d$ is a distributive version of a choice function. An operator $\langle\,\rangle^d$ lifts a choice function as in (ii).
(ii) $\langle\,\rangle^d = \lambda g_{(ett)(et)}.\,\lambda A_{ett}.\,\lambda B_{et}.\,A \neq \varnothing \wedge g(A) \subseteq B$

derives the interpretations that we need.

3.   Research on Alternative Questions

3.1. Syntax

Syntactic claims made for AltQs are based on those made for the *either/or* construction. For instance, Larson (1985) presents data in which both *either* and *whether* mark the scope of *or* in the *either/or* construction and in embedded AltQs. According to Larson (1985), *whether* exhibits scope-marking behavior (which is similar to that of *either*, as will be discussed in detail in Chapter 4). In (47), in addition to the reading in (47a), which corresponds to the one in which *whether* is replaced with *whether or not*, there is a reading in which disjunction takes scope at the intermediate clause level (47b). *Whether* marks the scope position of *or* in (47b).

(47)   I know whether [Bill should ask [John to resign or retire]].   (Larson (1985: 226))

    a.   {p: p is true & [[p = Bill should ask John to resign or retire]

            ∨ [p = ¬Bill should ask John to resign or retire]]}

    b.   {p: p is true & [[p = Bill should ask John to resign]

            ∨ [p = Bill should ask John to retire]]}

To account for the data in (47), Larson (1985) proposes a movement analysis of *whether* in (48) that employs the same movement as that of *either*/Op in (30).

(30)   **Either$_i$/Op** Mary **either$_i$/Op** is **either$_i$/Op** looking for [$_{XP}$ **t$_i$** a maid or a cook].

(48)   I know [**whether$_i$** [Bill should ask [**t$_i$** John to [**t$_i$** resign or retire]]]]

Whether, a *wh*-item, undergoes successive-cyclic movement from its base position adjacent

to the disjuncts to its surface position, where it marks the scope position of *or*, as in (48b).

Recall that another analysis proposed for the English *either/or* construction is the ellipsis analysis of Schwarz (1999). For English AltQs as well, one of the prominent analyses employs ellipsis. Based on Schwarz's (1999) ellipsis analysis, Han and Romero (2004) claim that matrix AltQs such as (49a) are derived from an underlying structure in (49b) in which the disjuncts are clauses that are transformed into the surface form through the movement of the Q operator and ellipsis in the second disjunctive clause.

(49) a.　Did John drink coffee or tea?

　　b.　Q_i　Did　t_i　[John drink coffee or ~~John drink~~ tea]?

Han and Romero (2004) essentially adopt Larson's (1985) analysis of *whether*, and claim that the Q operator has to undergo *wh*-movement. Naturally, the AltQ reading is predicted to be impossible when a DisjP is in an island, as in (50a) (whose underlying structure (50b) makes it clear that the Q-movement violates an island condition). Further, in some dialects of English, *whether* can appear in addition to the complementizer as in (51), showing that *whether* is a *wh*-phrase rather than a complementizer.

(50) a. * Do you believe the claim that John resigned or retired? (AltQ reading)

　　b.　Q_i　Do you believe the claim that John t_i [resigned or retired?]

(Han and Romero (2004: 532))

(51) a. ? John wonders whether that Mary ate beans.

　　b.　John wonders which sandwich that Mary ate.

(Belfast English; Han and Romero (2004: 536))

In support of the claim that English AltQs involve ellipsis, Han and Romero (2004) present cross-linguistic data and focus-related facts. Thus, it is possible to put forth an ellipsis

analysis for both the *either/or* construction and AltQs in English.

3.2. Semantics

A line of semantic research on AltQs uses the focus alternative semantics of Rooth (1985, 1992). The idea is that lexical items have two semantic values, namely, an ordinary semantic value, which is the normal denotation, and a focus semantic value, which is a set of alternatives. For an unfocused item, the ordinary semantic value is the normal denotation while the focus semantic value is a singleton set of the ordinary semantic value. For a focused item in (52), the ordinary semantic value is the normal denotation as in (52a) but the focus semantic value is a set of alternatives of the same semantic type, as in (52b).

(52)   [John]$_F$ left.

   a. $[\![\text{John}_F]\!]^O$ = John

   b. $[\![\text{John}_F]\!]^F$ = {John, Bill, Amelie, …}

Beck and Kim (2006) propose that in AltQs, the focus semantic value of the IP is a set of propositions that can serve as an answer to a question. For example, an AltQ in (53a) has a structure in (53b), and the DisjP with two IPs as its disjuncts has the two semantic values in (54).

(53) a.   Did the program execute or the computer crash?   (Beck and Kim (2006: 183))

   b.   [$_{CP}$ Q [$_{DisjP}$ [the program executed] or [the computer crashed]]]

(Beck and Kim (2006: 184))

(54) a. $[\![\text{DisjP}]\!]^O$ = λw. the program executed in w or the computer crashed in w

   b. $[\![\text{DisjP}]\!]^F$ = {λw. the program executed in w, λw. the computer crashed in w}

(Beck and Kim (2006: 184))

With the semantic work of the question operator, which turns the focus semantic value of its sister into the interpretation of the whole sentence, an AltQ reading is derived. However, the discussion in Chapter 4 will show that this analysis faces problems when data with *either* are considered.

Regarding the semantics of Japanese AltQs, Uegaki (2014a) examines Japanese AltQs such as (55) and claims that two YNQs are combined by a disjunction marker *soretomo*, as in (56).

(55) Taro-ga koohii-o   nonda ka otya-o nonda ka.
      T-Nom   coffee-Acc drank KA tea-Acc drank Q
      'whether Taro drank coffee or tea.'   (Uegaki (2014a: 48))

(56) [Taro-ga koohii-o   nonda ka] (soretomo) [~~Taro-ga~~ otya-o nonda ka].
      T-Nom   coffee-Acc drank Q Disj   T-Nom   tea-Acc drank Q
      'Which is true: Taro drank coffee or he drank tea.'   (Uegaki (2014a: 52))

In Uegaki (2018), he further attempts to unify *ka* used as a disjunction particle, used with indeterminate expressions to form indefinites, and used in questions as a Q particle.

This section has provided an overview of previous research on the syntax and semantics of the *either/or* and AltQ constructions. As shown, there has been very little research on the Japanese constructions, whereas considerable research has been conducted on the English constructions.

4.   Theoretical Framework

This section briefly introduces the theoretical background adopted in this thesis. The assumption adopted here is the basic idea of Principles-and-Parameters (P&P) approach of generative grammar (Chomsky (1981, 1986)), which asserts that children have an innate knowledge of language, called Universal Grammar (UG), and they develop UG into adult

grammar based on language input from the surrounding environment. Within this framework, cross-linguistic variations are derived by setting values of the parameters in languages in different ways.

Further, the architecture of grammar presumed in a minimalist approach to language (Chomsky (1995, 2000, 2001, 2004) among others) is assumed, which has undergone modifications from that in the P&P approach. As shown in (57), the grammar has interfaces with the sensorimotor (S-M) system and the conceptual-intentional (C-I) system, where phonetic/phonological computations and semantic/pragmatic computations take place. Since the S-M system and the C-I system are employed not only for language computations but also for other cognitive behavior, the interfaces between grammar and the two systems are important. The two interfaces are called the Phonetic Form (PF) and the Logical Form (LF).

(57)

Lexicon

Narrow Syntax

Spell-Out

PF   LF

S-M system   C-I system
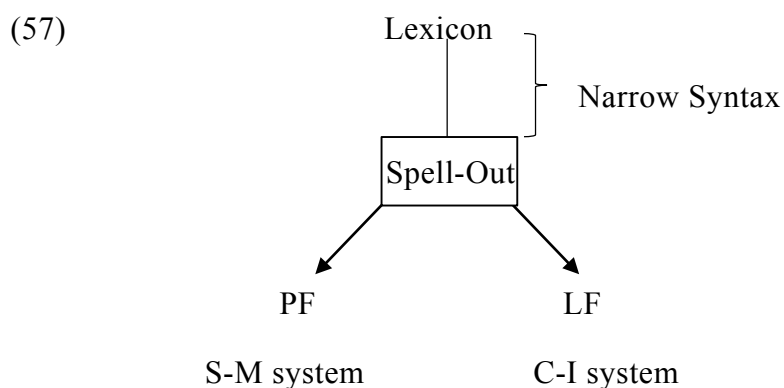
In Narrow Syntax, lexical items are taken from the Lexicon and new syntactic objects are formed by the operation Merge. After some structure is created through the merging of syntactic objects, at some point, the structure is sent to the S-M system and the C-I system via Spell-Out. It is assumed that at the two interfaces PF and LF, all syntactic objects need to be interpreted. Assuming this architecture, the questions addressed in this thesis mainly relate to the interface between syntax and semantics, specifically, how syntactic structures are interpreted at LF, and from whence cross-linguistic variations emerge.

Spell-Out takes place when a phase head is introduced into the structure. It is not the case that a sentence is interpreted at PF and LF after the whole structure is formed; rather, parts of the structure are spelled out and transferred to the two interfaces. At a phase level, which is generally assumed to be a DP, a vP, and a CP, the complement of a phase head is spelled out and cannot be subject to further syntactic operations. Thus, when an element has to undergo long-distance movement that passes through phases, the movement is cyclic, stopping at the specifier positions of phases.

Finally, this thesis adopts the copy theory of movement that is generally assumed in the minimalist framework. The copy theory of movement, represented in (58b), has been developed in an attempt to reanalyze the trace theory of movement adopted in the P&P approach, which is shown in (58a).

(58) a.   John$_i$ was arrested t$_i$.

b.   John was arrested ~~John~~.

Under the trace theory of movement, when *John* in a passive sentence is displaced from the object position to the subject position, it leaves a trace in its base position, as in (58a). The displaced item and the trace have the same index to mark identity. In the minimalist approach, traces with no theoretical necessity have been abandoned, and instead, it has been claimed that there is an unpronounced copy of the displaced item in the base position, as in (58b). The copy in the base position has the same properties as the pronounced item but is deleted in the phonological component because of linearization and reasons related to economy (Nunes (2004)). In Chapters 2 and 3, where the internal structure of DPs and DP-internal movements and how they are interpreted are discussed, it is assumed that the copy of a moved item is visible at LF and is interpreted.

5. Overview of the Thesis

The questions discussed in this thesis are repeated below.

(11) a. In the Japanese examples, how are *A ka B* 'A or B' and *dottika/dotti* 'either/which' syntactically analyzed?

    b. How are *A ka B* 'A or B' and *dottika/dotti* 'either/which,' with the syntactic structure revealed in (11a), semantically computed and how are the possible interpretations derived?

    c. What different syntactic and semantic properties are observed for the Japanese and English constructions?

    d. How can we account for the properties in (11c)?

Chapter 2 focuses on question (11a) and investigates the syntax of the Japanese *either/or* and AltQ constructions in relation to partitives. It first shows that the constructions are indeed partitives and then presents the proposed syntactic structure for partitives, which contains two fully projected DPs for the part element and the whole element, as well as a Functional Projection (FP) that lies in between the two DPs. It is also shown that the proposed structure accounts for data that has been problematic for a previous analysis, including word order facts, and that it can be directly extended to the *either/or* and AltQ constructions.

The goal of Chapter 3 is to provide an answer to question (11b) by presenting a semantic analysis of the Japanese *either/or* construction and AltQs based on the syntactic structure proposed in Chapter 2. I adopt the analysis of previous research that assigns *ka* as a Q-particle and an existential particle the semantic role of introducing a choice function variable, and further analyze the indeterminate expression common in the constructions, namely, *dotti*, as having the denotation of a set of choice functions. It is also demonstrated that the denotation of the whole sentence is correctly derived by making the DisjP, which

denotes a set of the disjuncts, the argument of the choice function variable introduced by *dotti*.

Chapter 4 turns to the English *either/or* and AltQ constructions and considers the questions in (11c,d). I examine the data introduced in (1)-(10) in detail and propose the following syntactic and semantic analyses. Syntactically, *dottika/dotti* 'either/which,' *either*, and a covert *wh* operator existing in English AltQs all occupy a position adjacent to the disjunction. The difference in the syntactic behavior between English and Japanese arises from the difference in the syntactic category of *dottika/dotti* 'either/which' and *either* and the difference in the freedom of ellipsis inside the disjuncts. Semantically, it is shown that the wide scope *or* data and the AltQ/YNQ readings are accounted for by combining an ellipsis analysis and a choice function analysis of *either*. In English and Japanese, *either*, a covert *wh* operator, and *dottika/dotti* 'either/which' all introduce choice function variables.

Chapter 5 concludes the thesis.

Chapter 2

The Syntax of Partitives and the *Either/or* and AltQ Constructions in Japanese

1. Introduction

1.1. Introduction

This chapter focuses on the syntax of Japanese partitives in (1a), the counterpart of the English *either/or* construction, namely *A ka B no dottika* in (1b), and Alternative Questions (AltQs) in (1c). The constructions in (1b,c), just like their English counterparts, include a Disjunction Phrase (DisjP). As illustrated in (1b,c), a DisjP consists of two (or possibly more) disjuncts connected by *ka* 'or,' a disjunction particle.

(1) a. Taro-wa hondana-ni atta hon-no #(uti-no) san-satu-o yonda.(partitives)[1]

   T-Top   bookshelf-on were book-NO out-of three-Cl-Acc read

   'Taro read three of the books on the bookshelf.'

   b. Taro-wa [DisjP koohii ka kootya]-no dottika-o nonda. (*either/or* construction)

   T-Top   coffee or tea-NO   either-Acc drank

   'Taro drank either coffee or tea.'

   c. Taro-wa [DisjP koohii ka kootya]-no dotti-o nomi-masi-ta ka? (AltQ)

   T-Top   coffee or tea-NO   which-Acc drink-Pol-past Q

   'Which did Taro drink: coffee or tea?'

---

[1] (1a) without *uti-no* 'out of' is marked as #, following Watanabe (2008). Although in my intuition *uti-n*o 'out of' is obligatory in this sentence, some speakers feel that it is optional.

The goal of this chapter is to provide a plausible syntactic structure for (1b,c). To attain this goal, I first concentrate on the partitive construction in (1a), since (1b,c) are in fact classified as a type of partitive. In the partitive example (1a), there are two Determiner Phrase (DP) projections that correspond to the part element and the whole element, and there is a Functional Projection (FP) between the two DPs, which establishes the part-whole relation. The structure proposed for (1a) is (2).

(2)   Taro-wa [$_{DP}$ [$_{DP}$ hondana-ni   atta   hon-no]   [$_{FP}$ uti-no]   san-satu-o]   yonda.

         T-Top   bookshelf-on   were   book-NO   out-of   three-Cl-Acc   read

         'Taro read three of the books on the bookshelf.'

I adopt the multiple functional layers in DPs and DP-internal movement proposed by Watanabe (2006) and argue that the proposed structure can account for peculiar restrictions on the possible word orders of partitives. The structure proposed for partitives can also be extended to the *either/or* and AltQ constructions in (1b,c) with minor modifications. It is thus shown that even though the surface forms of (1b,c) may seem simple, a DisjP and *dottika/dotti* 'either/which' that are combined through *no*, their actual structure is a multilayered structure with two DPs and an FP.

The chapter is organized as follows. The rest of this section introduces some basic data that show that the Japanese *either/or* and AltQ constructions are indeed partitive constructions and that they always have a DP layer that involves a DisjP. Section 2 presents my proposal for the syntactic structure of partitives in which both the part element and the whole element project a DP with a full internal structure; this proposal is based on Watanabe (2006), who investigates the structure of DP from the perspective of accounting for Floating Quantifiers. In Section 3, a previous study on the syntactic structure of Japanese partitives is reviewed. Sauerland and Yatsushiro (2017) examine the syntactic structure of Japanese partitives, based on Watanabe's (2006) claim. Although Sauerland

and Yatsushiro (2017) attempt to account for English and Japanese partitives in a parallel manner, the analysis encounters problems when we consider data that Sauerland and Yatsushiro (2017) do not. Then, Section 4 returns to the Japanese *either/or* and AltQ constructions and demonstrates that, under the present proposal that the constructions are a type of partitive, they are explained with the same syntactic structure proposed for partitives, although they also exhibit some behavior distinct from partitives. Section 5 addresses remaining problems such as variations of the *either/or* and AltQ constructions in which *dottika* 'either' and *dotti* 'which' are replaced with other items and those in which the disjunction is replaced with conjunction. The discussion in this chapter includes the observation that *dottika* 'either' and *dotti* 'which' in the *either/or* and AltQ constructions are replaced with items that can pick up more than one item from three or more options. This fact leads us to conclude that the *either/or* and AltQ constructions, whose charactersics is picking up one of two options, are not special constructions with a special structure, but are kind of a more general construction, i.e., partitives. Section 6 concludes the chapter.

1.2. Background Data on Partitives and the Either/or Construction

In this section, evidence that the Japanese counterparts of the *either/or* and AltQ constructions are a kind of partitive is introduced.

The Japanese *either/or* and AltQ constructions can be divided into at least two subcategories depending on what the DisjP contains as disjuncts. Specifically, the disjuncts can be common nouns/predicates, as in (3), or proper nouns/individuals, as in (4). These two types show slightly different behavior in terms of the use of classifiers and the noun that can accompany *dottika/dotti* 'either/which.'

(3) a. Taro-wa   koohii ka kootya(-no dottika)-o   nonda.

      T-Top   coffee or tea-NO   either-Acc   drank

      'Taro drank either coffee or tea.'

b. Taro-wa   koohii ka kootya-no dotti-o   nomi-masi-ta ka?

T-Top   coffee or tea-NO   which-Acc drink-Pol-past Q

'Which did Taro drink: coffee or tea?'

(4) a. Taro-wa   LGB ka MP(-no dottika)-o   yonda.

T-Top   LGB or MP-NO either-Acc   read

'Taro read either LGB or MP.'

b. Taro-wa   LGB ka MP-no dotti-o   yomi-masi-ta ka?

T-Top   LGB or MP-NO which-Acc read-Pol-past   Q

'Which did Taro read: LGB or MP?'

In the subsequent discussion, examples with common noun disjuncts are primarily used, since they are less restricted, although examples with proper noun disjuncts are occasionally referred to.

The Japanese *either/or* and AltQ constructions share two properties with partitives: the use of *uti-no* 'out of,' which emphasizes the part-whole meaning and is typically used in partitives, and the possible word orders. (5) and (6) show that the constructions can employ *uti-no* 'out of.'

(5)   Taro-wa hondana-ni atta hon-no   #(uti-no) san-satu-o   yonda. (partitives)

T-Top   bookshelf-on were book-NO out-of   three-Cl-Acc read

'Taro read three of the books on the bookshelf.'

(6) a. Taro-wa koohii ka kootya-no (uti-no) dottika-o   nonda. (*either/or* construction)

T-Top   coffee or tea-NO   out-of either-Acc drank

'Taro drank either coffee or tea.'

b. Taro-wa koohii ka kootya-no (uti-no) dotti-o   nomi-masi-ta   ka? (AltQ)

T-Top   coffee or tea-NO   out-of   which-Acc drink-Pol-past Q

'Which did Taro drink: coffee or tea?'

Notice, however, that the acceptability of the partitive example (5) without *uti-no* 'out of' varies among speakers, while the *either/or* and AltQ constructions (6) without *uti-no* 'out of' are acceptable. In Chapter 3, where a semantic analysis for the constructions is introduced, it is claimed that, even though the constructions share the important property of allowing the part-whole relation in their interpretation, the difference in the optionality of *uti-no* 'out of' indicates that the constructions do not have identical semantics.

The second property that the constructions share is the possible word order. As seen from (7)-(9), the possible word order of the *either/or* and AltQ constructions in (8) and (9) matches that of the partitives in (7) (cf. Watanabe (2008)). Note that the word orders in (7b,c) are ambiguous between a partitive reading and a nonpartitive reading, which is a reading in which the numeral modifies the noun, and there are only three books in the context. Uttering the sentences is natural in a partitive situation where Taro read three of the (possibly many) books on the bookshelf.

(7) a.   Taro-wa hondana-ni   atta   hon-no   #(uti-no) san-satu-o   yonda.

                                                    (NP-*no* + *uti-no* + Q + Case)

     T-Top   bookshelf-on were book-NO out-of   three-Cl-Acc read

     'Taro read three of the books on the bookshelf.'

  b.   Taro-wa hondana-ni   atta   hon   san-satu-o yonda.   (NP + Quantifier + Case)

  c.   Taro-wa hondana-ni   atta   hon-o san-satu   yonda.   (NP + Case + Quantifier)

(8) a.   Taro-wa [koohii ka   kootya]-no (uti-no) dottika-o   nonda.

                                                     (NP-*no* + *uti-no* + Q + Case)

     T-Top   coffee   or   tea-NO   out-of   either-Acc drank

  b.   Taro-wa [koohii ka   kootya(,)] dottika-o nonda.   (NP + Quantifier + Case)

  c.   Taro-wa [koohii ka   kootya]-o dottika   nonda.   (NP + Case + Quantifier)

(9) a. Taro-wa [koohii ka kootya]-no (uti-no) dotti-o   nomi-masi-ta ka?

(NP-*no* + *uti-no* + Q + Case)

T-Top   coffee   or tea-NO   out-of   which-Acc drink-Pol-past Q

b. Taro-wa [koohii ka kootya(,)] dotti-o nomi-masi-ta ka?

(NP + Quantifier + Case)

c. * Taro-wa [koohii ka kootya]-o dotti nomi-masi-ta ka? (NP + Case + Quantifier)

Although the word order NP + case + quantifier is not allowed for AltQs, as in (9c), it is illustrated in Section 4.2. that the impossibility of floating is not a characteristic limited to *dotti*, but is also observed for other *wh*-phrases.

Importantly, disallowed word orders are also shared by partitives and the *either/or* and AltQ constructions. Consider the possible word orders of Japanese partitives in (10).

(10)   Partitives

a. Taro-wa   hondana-ni   atta   hon-no   #(uti-no) san-satu-o   yonda.

T-Top   bookshelf-on were book-NO   out-of   three-Cl-Acc read

'Taro read three of the books on the bookshelf.'

b. Taro-wa hondana-ni atta hon   san-satu-o yonda. (NP + Quantifier + Case)

c. Taro-wa hondana-ni atta hon-o san-satu   yonda. (NP + Case + Quantifier)

d. # Taro-wa san-satu(-no/o) hondana-ni atta hon-no/o yonda.

(Quantifier + NP + Case)

In partitives, placing the numeral classifier (the part element) before the NP (the whole element) makes a partitive reading of the sentence impossible, as in (10d). (This word order is, as we will see in Section 3, what Sauerland and Yatsushiro (2017) refer to as "reverse partitives.").

The descriptive generalization about partitives stating that the whole element has to

precede the part element dates back to at least Haig (1980). Referring to Kuno (1973) as the original source of the examples, Haig (1980) provides the pair of sentences in (11) to argue for this generalization.

(11) a. Gakusei-no   ooku-wa   dokusin   desu.
       students-NO   many-Top   single   are
       'Many of the students are single.'

  b. Ooku-no   gakusei-wa   dokusin   desu.
       'Many students are single.'   (Haig (1980: 1075))

(11a) is unambiguously a partitive sentence, in which *gakusei* 'students' is the whole element and *ooku* 'many' is the part element. Thus, *uti-no* 'out of' can be inserted between *gakusei-no* and *ooku-wa* to clarify the interpretation. (11b), in which *gakusei* 'students' and *ooku* 'many' are in reverse order, is unambiguously a nonpartitive sentence whose sole reading is *ooku-no* 'many' modifying *gakusei* 'students.' The different readings allowed for (11a) and (11b) lead to the conclusion that the whole element cannot follow the part element in order to obtain a partitive interpretation.

    Now let us turn to the behavior of the *either/or* and AltQ constructions. In these constructions, *dottika/dotti* 'either/which,' which correspond to the part element, cannot be placed in front of the DisjP, which corresponds to the whole element, as in (12),.

(12) a. * Taro-wa dottika(-no) [DisjP koohii ka kootya]-o nonda. **(Quantifier+NP+Case)**
          T-Top   either-NO   coffee or tea-Acc   drank
  b. * Taro-wa dotti(-no) [DisjP koohii ka kootya]-o nomi-masi-ta ka?
          T-Top   which-NO   coffee or tea-Acc   drink-Pol-past Q

    Further, partitives and the *either/or* and AltQ constructions share another commonality.

Observe that we can replace the DisjP in (1b,c) with an NP, as shown in (13), which makes the similarity between partitives such as (10a) and the *either/or* and AltQ constructions even more evident.

(13) a. Taro-wa   futa-tu-no   nomimono-no (uti-no) dottika-o   nonda.
     T-Top   two-Cl-NO   drink-NO   out-of   either-Acc drank
     'Taro drank either of the two drinks.'

   b. Taro-wa   futa-tu-no   nomimono-no (uti-no) dotti-o   nomi-masi-ta ka?
     T-Top   two-Cl-NO   drink-NO   out-of   which-Acc drink-Pol-past Q
     'Which of the two drinks did Taro drink?'

From the discussion above, I take the Japanese *either/or* and AltQ constructions to be a type of partitive, with DisjP being the whole element and *dottika/dotti* 'either/which' being the part element, and I inspect the syntax of the constructions in relation to the partitive construction in the subsequent sections.

Finally, let me compare the possible word orders of partitives and the *either/or* and AltQ constructions with those of nonpartitives in (14). There are several word orders allowed that combine an NP, a numeral classifier, and a case particle. (14a) has the order NP + numeral classifier + case, (14b) NP + case + numeral classifier (an example of the so-called Floating Quantifier), and (14c) numeral classifier + NP + case.

(14)   Nonpartitives
   a. Taro-wa   hon   san-satu-o   katta.   (NP + Quantifier + Case)
     T-Top   book   three-Cl-Acc bought
     'Taro bought three books.'

   b. Taro-wa   hon-o   san-satu   katta.   (NP + Case + Quantifier)

   c. Taro-wa   san-satu-no hon-o   katta.   (Quantifier + NP + Case)

We have seen that placing the numeral classifier (the part element) before the NP (the whole element) makes a partitive reading of the sentence impossible, as in (10d) and (12), but this is a possible word order for nonpartitives as in (14c). This fact suggests that even though the items used in the constructions are very similar (NP, quantifier, and case particle), their structures are nonetheless different.

Now we have established a background for the investigation of the syntactic structure of the *either/or* and AltQ constructions in relation to partitive structures. We start from partitives with a numeral + classifier as the part element, such as the example in (1a), which is referred to as *numeral partitives* hereafter.

(1) a.   Taro-wa   hondana-ni   atta   hon-no   #(uti-no)   san-satu-o   yonda.

       T-Top   bookshelf-on   were   book-NO   out-of   three-Cl-Acc   read

       'Taro read three of the books on the bookshelf.'

2. Proposal: The Structure of Numeral Partitives

The core of my proposal is twofold: Numeral partitives involve two full DP projections with the internal structure of Watanabe (2006), and there is an FP that takes as its complement the DP that corresponds to the whole element and is in the specifier position of the DP that corresponds to the part element, as in the structure in (15).[4]

(15)   The proposed structure

```
                    DP_Part
                  /         \
              FP              \
            /    \           QP    D
      DP_Whole    F
```

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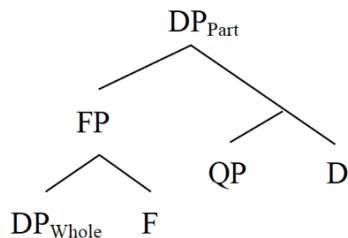
[4] The "whole" and the "part" on the DP as subscripts are used throughout the thesis to avoid confusion. They are descriptive labels and serve explanatory purposes only.

Each of the two DPs in (15) is claimed to have multiple layers of functional projections, adopting Watanabe's (2006) analysis of the internal structure of DPs. Watanabe (2006) attempts to account for the behavior of nonpartitives, whose basic possible word orders are illustrated in (16). According to his analysis, the possible word orders are derived from a uniform source.

(16)   Nonpartitives

    a. Taro-wa   hon   san-satu-o   katta.   (NP + Quantifier + Case)

        T-Top   book   three-Cl-Acc bought

        'Taro bought three books.'

    b. Taro-wa   hon-o   san-satu   katta.   (NP + Case + Quantifier)

    c. Taro-wa   san-satu-no hon-o   katta.   (Quantifier + NP + Case)

Watanabe (2006) argues for a uniform underlying structure that derives the possible word orders in (16) through multiple applications of remnant movement. All of the word orders in (16) are derived from a uniform source (17a), in which #P is headed by a classifier and takes an NP as its complement and a numeral in its specifier position. The order NP + quantifier + case in (16a) is derived via the obligatory movement of NP to SpecCaseP (17b), which is required for case reasons. From (17b), the order quantifier + NP + case in (16c) is derived via the optional movement of #P to SpecQP, as in (17c) (according to Watanabe (2006), this movement marks the mass/count distinction). The order NP + case + quantifier in (16b) is derived from (17c) by optionally moving CaseP to SpecDP, as in (17d) (this movement is claimed to mark nonspecificity).

(17) a.

#P
    3
      NP   #
      | |
    hon 'book' *satu* (Classifier)

b. hon san-satu-o

CaseP
  NP
  | #P   Case
  hon   *3*   *-o*
          t$_{NP}$ *satu*
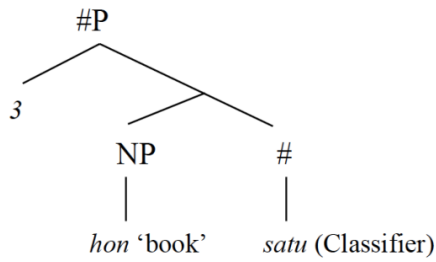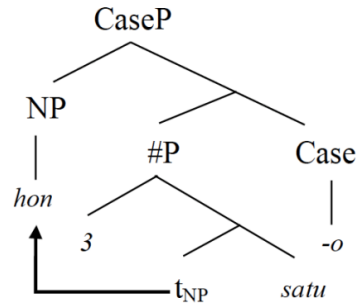
(requirement of Case; obligatory)

c. san-satu-no hon-o

QP
  #P
  3 t$_{NP}$ *satu*   CaseP   Q
           NP
           | t$_{#P}$ Case
           hon   *-o*
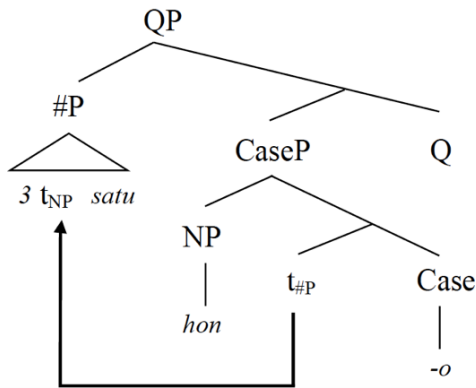
(mass/count distinction; optional)

d. hon-o san-satu (*specific / nonspecific)

DP
  CaseP
  hon t$_{#P}$ *-o*   QP   D
           #P
                 t$_{CaseP}$ Q
           3 t$_{NP}$ *satu*
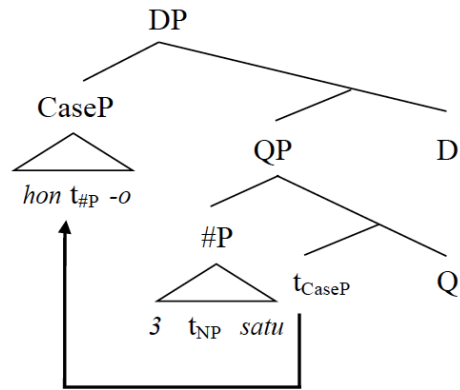
(marking nonspecificity; optional)

Watanabe (2006) gives the examples in (18) to show that a sentence with the word order in (17d) has only the nonspecific reading. The examples are provided to support his claim that the word order is derived through movement to SpecDP and that there is an agreement between D and the Case head that marks specificity (he does not go into the details of the semantic process through which the nonspecific reading becomes obligatory).

(18) a. John-wa piano ni-dai-o   kai-tagatta.

      J-Top   piano 2-Cl-Acc buy-wanted

      'John wanted to buy two pianos.'

    b. John-wa ni-dai-no piano-o kai-tagatta.

    c. John-wa piano-o   ni-dai   kai-tagatta.   (Watanabe (2006: 298))

While (18a,b) are ambiguous between the reading in which John wants two specific pianos and any two pianos, (18c) has only the reading where John wants any two pianos.[5]

Based on Watanabe's (2006) analysis of the inner structure of DPs and DP-internal movement, I next describe the first component of my proposal: Both the whole element and the part element project a full DP. The underlying form proposed for numeral partitives is provided in (19).[6]

---

[5] There are researchers who claim that nonpartitive examples are not derived from a uniform source but instead from different base structures. For example, Nakanishi (2007) proposes that (16a) involves the measurement of individuals (NPs), while (16b) involves the measurement of events (VPs) as well as individuals. Her argument is based on data such as (i) and (ii), where sentences with the NP-case-quantifier order can only have a multiple event reading; thus, it is impossible for such sentences to have a predicate denoting single-occurrence events (ib), and they cannot have a collective interpretation (iib).

(i) Single-occurrence events
   a. Gakusei san-nin-ga   kinoo   Peter-o {tataita/korosita} (koto)
      students three-Cl-Nom yesterday P-Acc   hit / killed   C
      'Three students {hit/killed} Peter yesterday.'
   b. Gakusei-ga   kinoo   san-nin   Peter-o {tataita/??korosita} (koto)
      students-Nom   yesterday three-Cl P-Acc   hit / killed   C
      'Three students {hit/killed} Peter yesterday.'   (Nakanishi (2007: 242-243))
(ii) Distributive/collective readings
   a. Otokonoko san-nin-ga   kinoo   isu-o   tukutta (koto)
      boy   three-Cl-Nom   yesterday chair-Acc made   C
      'Three boys made a chair/chairs yesterday.' (distributive/collective)
   b. Otokonoko-ga kinoo   san-nin   isu-o   tukutta (koto)
      boy-Nom   yesterday three-Cl chair-Acc made   C
      'Three boys made a chair/chairs yesterday.' (distributive/*collective)
                                                           (Nakanishi (2007: 244))
She accounts for the data by claiming that in (16b) with the NP-case-quantifier order, the quantifier is outside the DP and adverbially modifies the predicate. It seems that the same behavior is observed in numeral partitives.

Here, I do not intend to discuss whether the uniform approach or the nonuniform approach is better. Instead, it is assumed that the quantifier (numeral classifier) in a sentence with the NP-case-quantifier order can either be in the DP domain or the VP domain, and the focus of this thesis is to account for cases in which the numeral classifier is within the DP.

[6] I omit the # on *uti-no* 'out of' in parentheses hereafter.

(19) [[[(Go-satu-no) hondana-ni   atta hon-no]$_{DP}$ (uti-no)]$_{FP}$ [san-satu(-no

5-Cl-NO   bookshelf-on were book-Gen out-of   three-Cl-NO

hon)-ga]]$_{DP}$ nusumareta.

book-Nom   stolen

'Three of the (five) books on the bookshelf were stolen.'

As shown by the brackets, numerals and nouns in the whole and the part elements can be overt or covert if they are recoverable from the rest of the sentence. Both of them being overt is possible, although it sounds somewhat redundant, and either both or one of them being covert is natural.

2.1. *Two DPs in Numeral Partitives*

There are several pieces of evidence supporting the first aspect of my proposal that the part element and the whole element each project a DP. This section discusses the following points: (i) the part element and the whole element can each have a numeral, a classifier, a noun, and a case particle, which suggests that there exists a DP with multiple layers, (ii) the analysis explains the possible word orders within the part element and the whole element, and (iii) the analysis easily accommodates sentences without a partitive reading.

First, both the whole element and the part element can contain a numeral, a classifier, a noun, and a case particle, as in (20a). The structure I propose is in (20b). (The motivation for positing an FP layer and its nature are discussed in the next section.)

(20) a. Taro-wa [[hondana-ni atta   hon go-satu-no]$_{DP}$ (uti-no) hon san-satu-o]$_{DP}$

T-Top   bookshelf-on were book 5-Cl-Gen   out-of   book 3-Cl-Acc

yonda.

read

'Taro read three books of the five books on the bookshelf.'

b. Structure of (20a)

DP_Part
    FP
        DP_Whole
            QP
                CaseP
                    NP
                        RC   hon
                        hondana-ni atta
                    #P   Case
                        5   -no
                        t_NP   satu
                Q
            D_Whole
        F
    QP
        CaseP
            NP
                hon
            #P
                3
                t_NP   #   satu
            Case
                -o
        Q
    D_Part
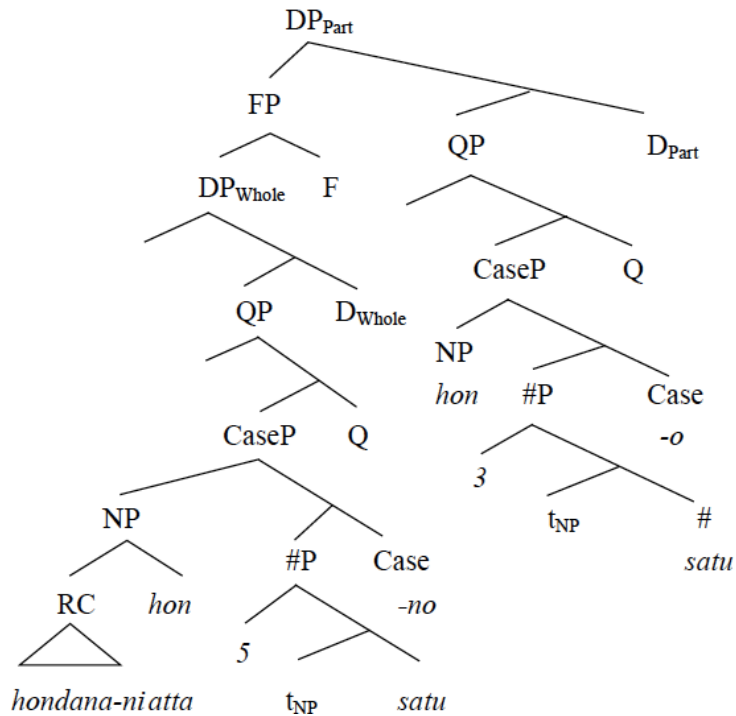
The fact that both the part element and the whole element can be fully realized with a numeral classifier and a noun can be easily captured in an analysis in which each of the elements projects a DP with multiple functional projections.

Some remarks on the nouns within DP_Part and DP_Whole are made. In (20a), the noun *hon* 'book' is in both DPs, and the sentence sounds somewhat redundant. There are several ways to reduce this redundancy. For instance, the noun in DP_Part can be elided if it is the same as the one in DP_Whole and is recoverable from the rest of the sentence, as in (21).

(21)   Taro-wa [[hondana-ni atta hon go-satu-no]_DP (uti-no) san-satu-o]_DP yonda.

T-Top   bookshelf-on were book 5-Cl-Gen   out-of   three-Cl -Acc read

'Taro read three of the five books on the bookshelf.'

Even *hon* 'book' in DP_Whole can further be elided if the context provides enough information, as in (22).

(22)   (Looking at a reading list)

Taro-wa [[(risto-ni aru) go-satu-no]$_{DP}$ (uti-no) san-satu-o]$_{DP}$ yonda.

T-Top   list-on   are 5-Cl-Gen   out-of   three-Cl-Acc   read

'Taro read three out of five (on the reading list).'

Deleting only the noun in DP$_{Whole}$ is also possible, as in (23).

(23)   Taro-ga [[hondana-ni atta   go-satu-no]$_{DP}$ (uti-no) san-satu-no hon-o]$_{DP}$

T-Nom bookshelf-on were 5-Cl-NO   out.of   3-Cl-NO   book Acc

yonda.

read

'Taro read three books out of the five books on the bookshelf.'

Further, the noun in DP$_{Whole}$ and DP$_{Part}$ need not be completely the same. For example, in (24), when the noun in DP$_{Whole}$ is understood as referring to books (as a general concept including magazines) and the noun in DP$_{Part}$ is a specific magazine, the intended reading comes out with a pause after *-no*. Using *uti-no* 'out of' makes it easier to obtain the reading. In this case, the noun in DP$_{Whole}$ has to be a more general noun that includes the noun in DP$_{Part}$ as a subkind, and the noun in DP$_{Whole}$ can be elided.

(24)   John-wa hondana-ni   atta   (hon) san-satu-no uti-no zassi-o   yonda.

J-Top   bookshelf-on were book 3-Cl-NO   out-of magazine-Acc read

'John read a magazine out of the three reading materials that Mary bought.'

In the examples hereafter, when *hon* 'books' and *zassi* 'magazines' occur in the same partitive sentence, and the sentence has a partitive interpretation in which *hon* is the whole element and *zassi* the part element, *hon* is translated as 'reading materials.' This is because,

even though in Japanese a magazine qualifies as a book, in English it does not.[7]

To summarize the data in (20)-(24), both the part noun and the whole noun being overt is possible (although it might sound somewhat redundant), and one or even both of them can be elided under certain conditions. All the data support the idea that there are two DP projections involved in numeral partitives.

The second piece of evidence supporting the present proposal is the multiple word orders possible within the two DPs. Since, in my analysis, the whole element and the part element independently project a DP, we predict that DP-internal movements proposed in Watanabe (2006) can take place within each DP. The following data support this prediction. Consider first (25) and (26).

(25)   ? Hondana-ni   atta   hon-no   (uti-no) hon   san-satu-ga   nusumareta.
      bookshelf-on   were   book-NO out-of   book 3-Cl-Nom   were.stolen
      'Three of the books on the bookshelf were stolen.'

(26)   Hondana-ni atta   hon-no   (uti-no) san-satu-no   hon-ga   nusumareta.
      bookshelf-on were   book-NO out-of   three-Cl-NO   book-Nom   were.stolen
      'Three of the books on the bookshelf were stolen.'

The examples show that, in the part element, multiple word orders are possible. We can account for this behavior by claiming that the part element projects a DP, and DP-internal movements occur within it. In (25), obligatory movement of NP in (17b) has taken place in DP_{Part}, and in (26), optional movement of #P in (17c) has further taken place.

The present proposal also explains sentence (27a), in which #P-movement to SpecQP has similarly taken place in the whole element from (20b). This process is shown in the structure in (27b).

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[7] I thank Christopher Tancredi (p.c.) for bringing the point to my attention.

(27) a. Taro-wa [[[#P go tNP satu]-no   hondana-ni   atta   hon t#P-no]DP (uti-no)

 T-Top   5-Cl-NO   bookshelf-on were book-Gen   out-of

 san-satu-no hon-o]DP   yonda.

 3-Cl-NO   book-Acc read

 'Taro read three books of the five books on the bookshelf.'

b. Structure of (27a)

```
                          DPPart
                        /        \
                    FP              \
                  /    \          QP      D
             DPWhole    F       /    \
            /      \           #P      \
          QP        D       /\    CaseP      Q
         /   \    3 satu          /    \
       #P      \              NP           \
      /\      CaseP   Q      /   \          Case
    5 satu    /   \        hon   t#P         -o
        NP          \
       /   \   t#P   Case
     RC     hon       -no
    /\
 hondana-ni  atta
```
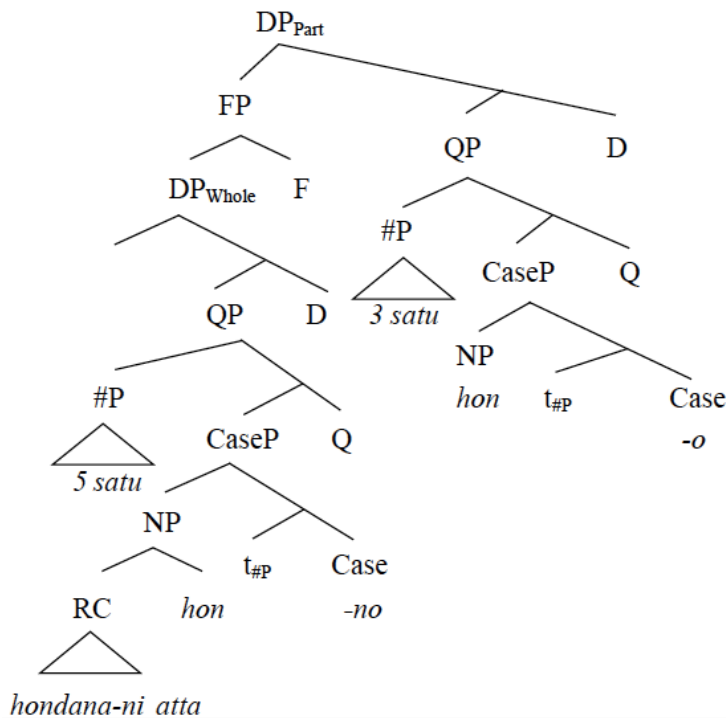
Furthermore, in the present analysis, there is nothing to prevent DP-internal movements occurring independently within DPWhole and DPPart. Thus, for example, sentences such as (28a,b) are predicted to be acceptable, which is indeed the case. In (28a), only the NP has moved in DPWhole, while #P movement has further occurred in DPPart. (28b) demonstrates the reverse pattern.

(28) a. Taro-wa [[hondana-ni   atta   hon   go-satu-no]$_{DP}$ (uti-no) san-satu-no

 T-Top   bookshelf-on were book 5-Cl-Gen   out-of   3-Cl-NO

 hon-o]$_{DP}$ yonda.

 book-Acc read

 'Taro read three books of the five books on the bookshelf.'

 b. Taro-wa [[go-satu-no hondana-ni   atta hon-no]$_{DP}$ (uti-no) hon san-satu-o]$_{DP}$

 T-Top   5-Cl-NO   bookshelf-on were book-Gen out-of   book 3-Cl-Acc

 yonda.

 read

 'Taro read three books of the five books on the bookshelf.'

(29) a. Structure of (28a)
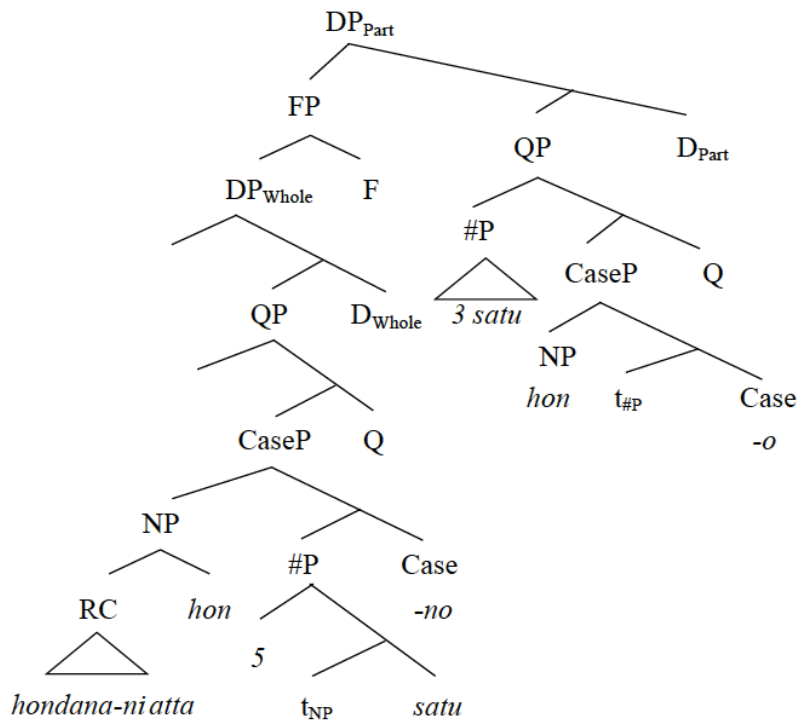
b. Structure of (28b)
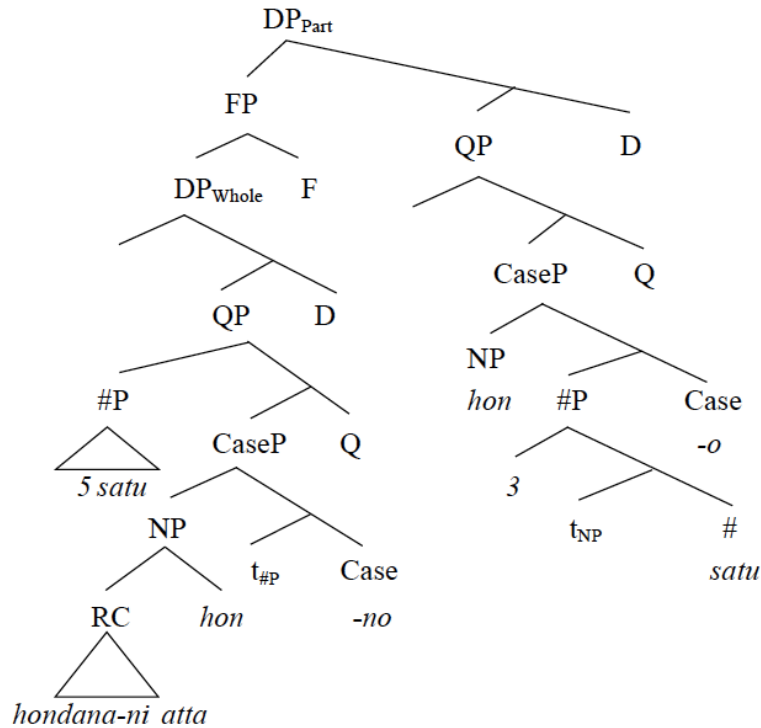
The third piece of evidence supporting the present proposal is that it can easily accommodate sentences in (30).

(30) a Taro-wa san-satu-no hon-o   yonda.

T-Top   3-Cl-NO   book-Acc read

'Taro read three books.'

b. Taro-wa hon   san-satu-o yonda.

c. Taro-wa hon-o san-satu   yonda.

Since the part element and the whole element project a DP independently in the present proposal, we predict that DP$_{Whole}$ does not have to be generated. Sentences without a partitive reading, such as (30), are claimed to be such examples. (The surface form may be the same as the partitive examples.) The fact that the sentences in (30) lack a partitive reading is explained since these sentences involve only a single DP.

Before we proceed to the next subsection, potentially problematic examples are examined. If we adopt the DP-internal structure and movement of Watanabe (2006), (31a) should be derived from (28b) through the movement of CaseP within DP$_{Whole}$, and (31b) should be derived from (28a) through the movement of CaseP within DP$_{Part}$. Both movements are the same as the movement in (17d), but the resulting sentences in (31) are unacceptable. The rest of this subsection discusses the possibility that this unacceptability is related to the nature of numeral quantifiers and specificity.

(31) a. ?*Taro-wa [[**[$_{CaseP}$ hondana-ni atta hon t$_{\#P}$ -no]** go-satu t$_{CaseP}$]$_{DP}$ (uti-no) san-satu-no hon-o]$_{DP}$ yonda.

    b. ?*Taro-wa [[hondana-ni atta hon go-satu-no]$_{DP}$ (uti-no)**[$_{CaseP}$ hon-o]** san-satu t$_{CaseP}$]$_{DP}$ yonda.

It is possible to attribute the degraded status of (31a) to the nature of numeral quantifiers because, in general, the word order in which the quantifier follows CaseP is not allowed within DP with a genitive case marker. Consider the sentences in (32) ((32b,c) are from Shibatani (1977: 797)).

(32) a. Sorera-no sensei san-nin-no okusan-ga wakai.
        those-NO teachers three-Cl-Gen wife-Nom young.
        'Those three teachers' wives are young.'

    b. Sorera-no san-nin-no sensei-no okusan-ga wakai.

    c. * Sorera-no sensei-no san-nin okusan-ga wakai.

While sentences (32a,b) are unproblematic, (32c) with the quantifier following the first noun is unacceptable. This word order (noun + case + quantifier) is derived by moving the CaseP *sensei-no* 'teacher-Gen' from the complement position of QP to SpecDP. Since this

movement is not allowed in (32c), the unacceptability of (31a) is attributed to the movement of CaseP in which the case marker is the genitive case.

The degraded status of (31b), in contrast, seems to stem from the specificity of DP$_{Part}$. Enç (1991) argues that the part element in English partitives is specific, based on her definition of specificity determined by inclusion. To understand her definition of specificity, consider (33). An indefinite phrase *two boys* in the second sentence of (33) can have both a nonspecific and a specific reading.

(33)   Several students entered the museum. I saw *two boys* at the movies.

(Enç (1991: 8))

In its nonspecific reading, two boys went to the movies instead of the museum, and they are not included in the group of several students in the first sentence. In its specific reading, however, two boys among the several students who went to the museum went to the movies afterwards. When the indefinite phrase *two boys* is specific, there is an inclusion relationship between *two boys* and *several students*.

According to Enç's (1991) definition of specificity, the part element in partitives is most naturally understood as specific, since in partitives, there is always an inclusion relation between the part element and the whole element. This relationship is confirmed by Enç's (1991) further observation that a partitive expression is prohibited from occurring in existential sentences, as shown in (34).

(34) a. * There are some of the cows in the backyard.
    b. * There are two of the cows in the backyard.
    c. * There aren't any of the cows in the backyard.   (Enç (1991: 14))

Note that the expressions used in (34) are not the source of the unacceptability, as is clear

from the perfect sentences in (35).

(35) a.   There are some cows in the backyard.

  b.   There are two cows in the backyard.

  c.   There aren't any cows in the backyard.   (Enç (1991: 14))

Enç (1991) claims that NPs that can occur in existential sentences, including those in (35), are nonspecific, according to her definition. Since the same items become unacceptable when they are the part element in partitives as in (34), the part element in partitives has to be specific.

   Now let us return to the degraded example (31b) repeated below. Recall that the word order *hon-o san-satu* 'book-Acc 3-Cl' is claimed by Watanabe (2006) to have only the nonspecific reading, as observable from (18c) in comparison with (18a,b).

(31) b. *?Taro-wa [[hondana-ni atta hon go-satu-no]$_{DP}$ (uti-no)**[$_{CaseP}$ hon-o]** san-satu

   t$_{CaseP}$]$_{DP}$ yonda.

(18) a.   John-wa piano ni-dai-o   kai-tagatta.

   J-Top   piano 2-Cl-Acc buy-wanted

   'John wanted to buy two pianos.'

  b.   John-wa ni-dai-no piano-o kai-tagatta.

  c.   John-wa piano-o ni-dai   kai-tagatta.   (Watanabe (2006: 298))

(18a,b) have a specific reading in which John wanted to buy two pianos specified in the discourse and a nonspecific reading in which John wanted to buy any two pianos. (18c), in contrast, has only the nonspecific reading. It is possible to account for the degraded status of (31b) by claiming that there is a mismatch in specificity within DP$_{Part}$. That is, even though there is a requirement that DP$_{Part}$ be specific, the word order in (31b) forces a

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nonspecific reading, and this mismatch leads to the degraded status of (31b).

However, the situation is not as simple as expected. When we construct examples in which the whole noun and the part noun differ, only (31b) improves, as in (36).

(36) a. *?Taro-wa [[hondana-ni atta [_{CaseP} **hon t_{#P} -no (uti-no)]** go-satu t_{CaseP}]_{DP}

       T-Top   bookshelf-on were   book -Gen out-of   5-Cl

       (uti-no) san-satu-no zassi-o]_{DP}   yonda.

       out-of   3-Cl-NO   magazine-Acc read

       'Taro read three magazines out of the five reading materials on the bookshelf.'

    b. Taro-wa [[hondana-ni atta go-satu-no hon-no]_{DP} (uti-no) [_{CaseP} **zassi-o]**

       san-satu t_{CaseP}]_{DP} yonda.

I would like to point out the possibility that the improved judgment of (36b) is related to givenness. This is because one difference between (31b) and (36b) is that the noun *hon* 'book' in DP_{Part} in (31b) is given by the previous discourse, whereas *zassi* 'magazine' in (36b) is not.[8] A detailed examination of this phenomenon is left for future research, however.

This section has laid out the first component of my proposal: The part element and the

---

[8] Christopher Tancredi (p.c.) refers to examples in (ia) and (ib) that are similar to (31b) and (36b) and observes that (ia) has only a reading in which Taro has a specific piano in mind, whereas (ib) also has a reading in which Taro is satisfied with any piano among Yamaha's instruments.

(i) a. Taro-wa Yamaha-no piano-no   (uti-no) piano-o   kaitagatta.
     T-Top   Y-Gen   piano-Gen out-of piano-Acc wanted.to.buy
     'Taro wanted to buy a (specific) piano among Yamaha's pianos.'
    b. Taro-wa Yamaha-no gakki-no   (uti-no) piano-o   kaitagatta.
     T-Top   Y-Gen   instrument-Gen out-of piano-Acc wanted.to.buy
     'Taro wanted to buy a piano among Yamaha's instruments.'

He further points out that in the reading only available for (ib), namely Taro being satisfied with any piano among Yamaha's instruments, *gakki* 'instruments' and *piano* 'piano' have a kind/subkind relationship. This reading is impossible for sentences with two identical nouns in the whole element and the part element, for example, (ia) and (31b), and the improvement in the acceptability of (36b) might be related to the presence of this reading.

whole element both project a DP. The main data observed in this section are summarized in Table 1 below.

Table 1: Partitive data

Both DP$_{Part}$ and DP$_{Whole}$ can have an overt head noun, a numeral, and a classifier		(20a)
Multiple word orders are possible in DP$_{Part}$ and DP$_{Whole}$ independently	A numeral and a classifier can apprar in front of or between NP and case	(25)-(28)
	A numeral and a classifier cannot follow NP+case	?*(31)
There are examples with only a single occurrence of head noun, a numeral, and a classifier, which do not have a partitive reading		(30)

The next section focuses on the FP that is present between the two DPs.

2.2. *The Functional Projection between DP$_{Whole}$ and DP$_{Part}$*

The second component of my proposal is the FP between DP$_{Whole}$ and DP$_{Part}$, shown in the proposed structure repeated below.

(15)   The proposed structure
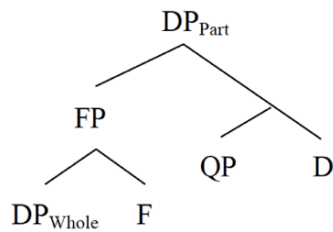
DP$_{Part}$ takes an FP in its specifier, and this FP takes DP$_{Whole}$ as its complement. The F head semantically marks the part-whole relation.

An advantage of hypothesizing the presence of the FP is that *uti-no* 'out of' fits into the structure. As introduced in Section 1.2., *uti-no* 'out of,' an item that strengthens the part-whole relation, is used in partitives, as in (37). However, there is no position that this item can occupy in the DP layer. In previous research, the status of *uti-no* 'out of' has remained a mystery.

(37)   Taro-wa [[hondana-ni atta   hon-no]$_{DP}$ #(uti-no) san-satu-o]$_{DP}$ yonda.

       T-Top   bookshelf-on were book-NO   out-of   three-Cl-Acc read

       'Taro read three of the books on the bookshelf.'

I propose that *uti-no* 'out of' resides in the F head position in (15) and marks the part-whole relation, i.e., that DP$_{Part}$ is the improper part of DP$_{Whole}$. (The semantic role of the F head is discussed in Chapter 3.)

Chizuru Nakao (p.c.) observes that there are variations in the form of the F head, for example, *naka-no* 'inside-of' in (38a), without *no* in (38b) (the forms require a comma and an intonation break after *uti* and *naka*), and *uti-de* or *naka-de* in (38c).

(38) a.   Taro-wa [[hondana-ni   atta   hon go-satu-no]$_{DP}$ naka-no   san-satu-o]$_{DP}$ yonda.

       T-Top   bookshelf-on were book 5-Cl-Gen   inside-of three-Cl-Acc read

       'Taro read three of the five books on the bookshelf.'

   b.   Taro-wa [[hondana-ni   atta   hon   go-satu-no]$_{DP}$ uti/naka, san-satu-o]$_{DP}$

       T-Top   bookshelf-on were book   5-Cl-Gen   inside   three-Cl-Acc

       yonda.

       read

       'Taro read three of the five books on the bookshelf.'

c. Taro-wa [[hondana-ni   atta   hon   go-satu-no]$_{DP}$ uti-de/naka-de

T-Top   bookshelf-on were book 5-Cl-Gen   inside-Loc

san-satu-o]$_{DP}$ yonda.

three-Cl -Acc read

'Taro read three of the five books on the bookshelf.'

There are some similarities between the items that function as F and locative postpositions

(Ps) in (39). I suggest that the variations in the form of F can be accounted for as Pn heads,

based on Watanabe's (2009) analysis on functional projections within PPs.

(39) a. John-no   ushiro-ni   Bill-ga   iru.

J-NO   behind-Loc B-Nom   is

'Bill is behind John.'

b. Tatemono-no   waki-ni   miti-ga   aru.

building-NO   beside-Loc road-Nom is

'There is a road beside the building.'

c. John-to Bill-no aida-ni   Mary-ga suwatta.

J-and   B-NO   between-Loc M-Nom   sat

'Mary sat between John and Bill.'

Watanabe (2009) argues for the structure in (40a) to explain the position of measure

phrases (MPs) within PP. An example of a simple PP structure without any movement is

given in (40b).[9]

(40) a.   [$_{PoP}$ [$_{DegP}$ [$_{QP}$ [$_{DimP}$ [$_{\#P}$ [$_{PnP}$ [$_{RP}$ DP R] Pn] #] Dim] Q] Deg] Po]

---

[9] According to Watanabe (2009), the movement of PnP to SpecDimP and subsequent
movement of RP to SpecPoP always take place.

b.　[PoP [DegP [QP [DimP [#P [PnP [RP *John-no* R] *ushiro*] #] Dim] Q] Deg] *ni*]

The Po(sition) head, slightly modifying the analysis of Watanabe (1993), relates the rest of the item in the PP to some other phrase in the sentence. The Pn head, which corresponds to the L(ocation) head in Watanabe (1993), specifies the location of the DP in the PP. As in (40b), *ushiro* 'behind' is claimed to be a Pn head and not a noun in Watanabe's (2009) analysis. This is because the linker *no*, which always appears between a nonclausal expression and a noun (Kitagawa and Ross (1982)), cannot occur between an MP and a Pn head, as in (41).

(41)＊　John-no　yon-meetoru-no　ushiro-ni　　Bill-ga　iru.

　　　J-NO　　4-meter-Lin　　　behind-Loc　B-Nom　is

　　　'Bill is found four meters behind John.'　　　　　　　(Watanabe (2009: 12))

There are several pieces of evidence that indicate that the items used as F and Pn heads are similar. First, *uti* and *naka* can be used as a locative P, as in (42).

(42)　　Heya-no　{uti-ni-wa/naka-ni-wa} takusan-no　hito-ga　　　ita.

　　　　room-NO　inside-Loc-Top　　　　many-Lin　people-Nom　were

　　　　'There were many people in the room.'

Second, using *de* instead of *no*, exemplified in (38c), is also possible for locative Ps, as shown in (43). *De* is claimed to be a Po head in Watanabe (2009).

(43)   John-no   ushiro-de   kodomotati-ga   kenka-o   hajimeta.

         J-NO   behind-Loc   children-Nom   fighting-Acc   started

         'Children started fighting behind John.'

Third, we can replace *uti* and *naka* with other Pn heads that can even accompany MPs, as
the examples in (44) illustrate.

(44) a.   Taro-wa [[hondana-ni   atta   gengogaku-no hon   go-satu-no]$_{DP}$ aida-no

          T-Top   bookshelf-on were linguistics-NO book 5-Cl-Gen   between-Lin

          tougoron-no   hon   san-satu-o]$_{DP}$ yonda.

          syntax-NO   books three-Cl-Acc   read

          'Taro read three books on syntax which were placed between the five books on

          linguistics which were on the bookshelf.'

      b. Taro-wa [[hondana-ni   atta   gengogaku-no hon   go-satu-no]$_{DP}$ 15-senti

          T-Top   bookshelf-on were linguistics-NO book 5-Cl-Gen   15-cm

          sita-no   tougoron-no   hon   san-satu-o]$_{DP}$ yonda.

          under-Lin syntax-NO   books three-Cl-Acc read

          'Taro read three books on syntax which were placed 15 centimeres below the five

          books on linguistics which were on the bookshelf.'

Note that *uti* and *naka* used in numeral partitives cannot accompany an MP, as shown in
(45).

(45)   Taro-wa [[hondana-ni   atta   hon   go-satu-no]$_{DP}$ (*15-senti) {uti/naka}-no

         T-Top   bookshelf-on were book   5-Cl-Gen   15-cm   out/inside-of

         san-satu-o]$_{DP}$ yonda.

         three-Cl-Acc   read

The discussion above makes it plausible that *uti* and *naka*, when they appear in the F head position, are Pn heads that are sometimes accompanied by a Po head *de*.

This section has presented the syntactic analysis of numeral partitives. In the next section, a previous analysis of Japanese numeral partitives by Sauerland and Yatsushiro (2017), who attempt to account for English and Japanese numeral partitives in a parallel manner, is reviewed. Nonetheless, it is shown that their analysis faces problems when we consider data that they do not.

3.   A Previous Study: Sauerland and Yatsushiro (2017)

3.1.   *Sauerland and Yatsushiro (2017)*

Sauerland and Yatsushiro's (2017) analysis of numeral partitives is based on Jackendoff's (1977) proposal that English partitives have a noun in both the part element and the whole element even when it is covert. Sauerland and Yatsushiro (2017) illustrate the underlying forms of English partitives as in (46), and argue that Japanese numeral partitives also contain nouns in both the whole element and the part element ("unit" in their terms), either of which can be unpronounced.

(46) a.   two books/things of all the books Gina has

  b.   two ~~books/things~~ of the books (plain partitives)

  c.   two books of all those ~~books/things~~ Gina has (reverse partitives)

  d.   two ~~books/things~~ of those ~~books/things~~   (Sauerland and Yatsushiro (2017: 2))

According to Sauerland and Yatsushiro (2017), there are partitives in Japanese that correspond to the English partitives in (46b,c). The typical partitive in (47a) is a plain partitive, and (47b), which does not have a partitive interpretation and is usually not regarded as a partitive construction, is also analyzed as a reverse partitive.

(47) a. Hon-no   san-satu-ga   nusumareta. (plain partitives)

book-NO   three-Cl-Nom stolen

'Three of the books were stolen.'

b. San-satu-no   hon-ga   nusumareta. (reverse partitives)
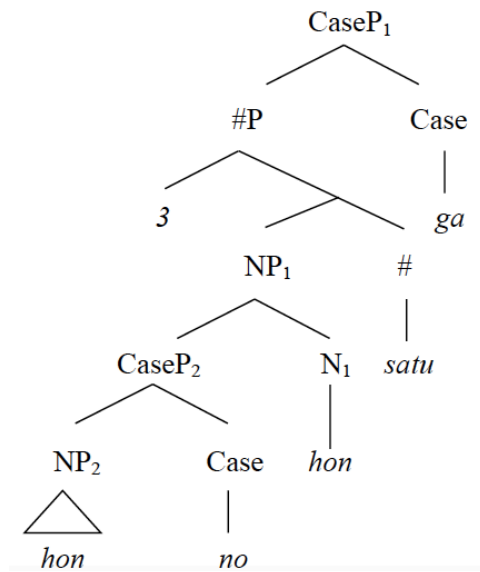
three-Cl-NO   book-Nom stolen
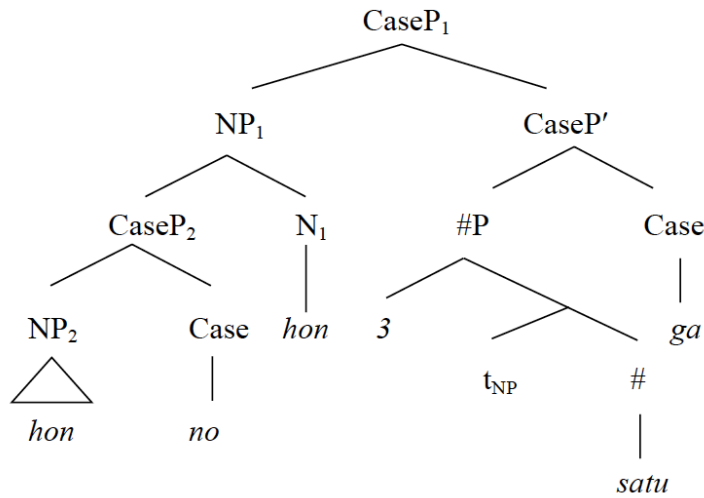
'Three books were stolen.'   (cf. Sauerland and Yatsushiro (2017: 4))

Sauerland and Yatsushiro (2017) propose a structure and derivation for (47a,b) that are partially based on Watanabe's (2006) DP structure and DP-internal movements. They claim that both plain partitives and reverse partitives are derived from a uniform underlying source of partitives in (48a) and that after the initial movement, the structure is as in (48b).

(48) a. Underlying structure (cf. Sauerland and Yatsushiro (2017: 17))

```
                        CaseP₁
                       /      \
                    #P         Case
                   /  \          |
                  3    \         ga
                  NP₁   #
                 /  \   |
            CaseP₂  N₁ satu
            /   \    |
         NP₂   Case hon
          △     |
         hon    no
```

b. Structure after initial movement of NP to SpecCaseP (cf. (17b))

$$\text{CaseP}_1$$
$$\text{NP}_1 \quad \text{CaseP}'$$
$$\text{CaseP}_2 \quad \text{N}_1 \quad\quad \#\text{P} \quad \text{Case}$$
$$\text{NP}_2 \quad \text{Case} \quad hon \quad 3 \quad\quad ga$$
$$hon \quad no \quad\quad t_{\text{NP}} \quad \#$$
$$satu$$

In the underlying structure (48a), the part-whole relation is implemented by *no*, which relates the whole element NP_2 and the part element N_1. The initial movement is the same for plain partitives and reverse partitives. In (48b), NP movement from the complement position of #P to the specifier position of CaseP has taken place from (48a). This movement is, according to Sauerland and Yatsushiro (2017), the same movement as (17b) proposed by Watanabe (2006).

Sauerland and Yatsushiro (2017) claim that plain partitives and reverse partitives differ in that, in the former, the head noun in the part element is elided, whereas in the latter, NP in the whole element is deleted. The derivations after (48b) that they posit for the two forms are shown in (49) and (50), respectively.

(49)   plain partitives (= (47a))

[[hon-no ~~hon~~]$_{\text{NP}}$ [san t_{NP} satu]$_{\#\text{P}}$-ga]$_{\text{CaseP}}$ ("part" noun-deletion)

(50)   reverse partitives (= (47b))

a.   [[~~hon~~-no hon]$_{\text{NP}}$ [san t_{NP} satsu]$_{\#\text{P}}$-ga]$_{\text{CaseP}}$ ("whole" NP-deletion)

b.   [[san t_{NP} satsu]$_{\#}$ [~~hon~~-no hon]$_{\text{NP}}$ $t_{\#\text{P}}$-ga]$_{\text{QP}}$ (Q-inversion; cf. (17c))

(cf. Sauerland and Yatsushiro (2017: 17))

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After the initial movement, either *hon* 'book' within the moved NP *hon-no hon* can be elided. Deleting the higher *hon*, which is the head noun of the part nominal, derives the plain partitive sentence, as in (49). A partitive reading is obtained with the work of *-no* that marks the part-whole relation. In contrast, when the lower *hon*, which is the NP in the whole nominal, is deleted, the result is the form in (50a). [10] Although (50a) is ungrammatical because the suffix *-no* does not have a host to attach to, movement of #P to SpecQP, in (50b), can solve this problem, deriving the reverse partitive sentence in (47b). Again, this movement of #P to SpecQP is the same movement as in (17c) proposed by Watanabe (2006). As for the fact that the reverse partitive sentence in (47b) does not have a partitive interpretation, Sauerland and Yatsushiro (2017) propose that the part-whole relation is vacuous in this sentence since the whole noun is elided and the speakers can assign any kind of unspecific noun to this position (e.g., *three books of _all the stuff in the world_*).

Thus, they take both (47a) and (47b) to be partitives and unify the *no* used in the two sentences. In their view, one of the advantages of incorporating sentences such as (47b), which are generally not considered to be partitives, into the paradigm of partitives is that it maintains the parallelism between English partitives and Japanese partitives since either of the two head nouns can be elided.

Despite Sauerland and Yatsushiro's (2017) attempts to make English and Japanese partitives parallel, their analysis encounters problems when we take a closer look at partitive data. Section 3.2. describes those problems. Although I agree with Sauerland and

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[10] As the reader might notice, the structures in (48a,b) imply that sizes of the elided element in the part element and in the whole element differ. The elided *hon* in the part element is a head noun, which takes $CaseP_2$ as its argument. In contrast, the elided *hon* in the whole element is an NP. Sauerland and Yatsushiro (2017) do not provide evidence why this is so, and in fact, they seem to be indifferent to the exact size of the elided material. This is because, in another part of the paper, Sauerland and Yatsushiro (2017: 3) state that in the derivation of plain partitives, "the unit NP *hon* … is deleted" while reverse partitives involve "deletion of the whole NP *hon* … instead of the unit NP." Thus, it is assumed in this chapter that the elided material can be either a head noun or an NP in their analysis.

Yatsushiro (2017) that plain partitives have nouns in both the whole element and the part element, I argue against their analysis and claim that their reverse partitives are in fact not partitives.

3.2.   *Problems for Sauerland and Yatsushiro (2017)*

There are two relevant problems concerning Sauerland and Yatsushiro's (2017) analysis: Whether reverse partitives should really be treated as partitives and whether the proposed structure and derivation can be extended to other data.

The first reason to doubt whether reverse partitives are indeed partitives is that, if *-no* in reverse partitives is the same item as in plain partitives and marks the part-whole relation, we predict that it should be replaceable with *-no uti-no* 'out of,' which emphasizes the part-whole relation. This is not the case, however. As shown in (51), using *-no uti-no* 'out of' in reverse partitives is completely unacceptable.

(51)   * San-satu-no   uti-no   hon-ga   nusumareta.

three-Cl-NO   out-of   book-Nom   stolen

(intended) 'Three books (of all the stuff in the world) were stolen.'

The second reason to argue against the idea that reverse partitives are partitives is that there are multiple pieces of evidence that cast doubt on the existence of a silent whole nominal in reverse partitives. If the noun that works as the whole element does not exist, there is no reason to maintain that reverse partitives are partitives. The first piece of evidence is related to Sauerland and Yatsushiro's (2017) claim that there is a silent whole nominal in reverse partitives, which is an unspecific noun such as *mass* or *stuff*. This noun cannot be overtly realized in reverse partitives or plain partitives, as exemplified in (52).

(52) a. * San-satu   mono-no   hon-ga   nusumareta.

   three-Cl   thing-NO book-Nom stolen

   (intended) 'Three books (of all the stuff in the world) were stolen.'

   b. * Mono-no   san-satu-no   hon-ga   nusumareta.

   thing-NO   three-Cl-NO book -Nom   stolen

   (intended) 'Three books of (all) the things were stolen.'

Another example showing that a silent whole nominal does not exist in reverse partitives is in (53), given by Ishizuka (2018). Ishizuka (2018) argues against Sauerland and Yatsushiro's (2017) idea that reverse partitives are partitives by showing that there is little evidence suggesting the existence of the silent whole nominal since it cannot be modified in reverse partitives, as in (53).

(53)   [[Ni-satu]ᵢ [~~hon~~ (*zyu-satu_whole)-no hon_part]_NP   tᵢ]-o   yonda.

    2-Cl   book 10-Cl-NO   book   -Acc   read

    '(I) read two (*of ten) books.'   (Ishizuka (2018: 171))

If we assume that the NP in the whole element is elided, it is a mystery why it cannot be the case that *zyu-satu* '10-cl' overtly modifies the silent NP and *ni-satu* '2-Cl,' which modifies the part NP, moves to the front at the same time. There is no syntactic or semantic evidence that a silent NP exists in the whole element. Note, however, that Sauerland and Yatsushiro (2017) argue that the movement of #P (Q-inversion) is a last-resort operation and can only take place when *-no* does not have a host to attach to. This would rule out the movement of *ni-satu* '2-Cl' taking place while the overt numeral classifier modifies the silent noun in (53), since *-no* has a host to attach to, namely the numeral classifier modifying the silent noun.

From the discussion above, we conclude that the examples that Sauerland and

Yatsushiro (2017) provide are not reverse partitives. Rather, sentences in which the noun within the whole element has been deleted but the partitive interpretation is retained are examples of reverse partitives. For example, sentence (54) introduced above and sentence (55), which is the Japanese version of the English reverse partitive sentence in (46c), clearly have a partitive reading.[11]

(54)   Taro-ga [[hondana-ni atta ~~hon~~ go-satu-no]$_{DP}$ (uti-no) san-satu-no hon-o]$_{DP}$
        T-Nom   bookshelf-on were book 5-Cl-Gen   out.of 3-Cl-NO   book Acc
        yonda.
        read
        'Taro read three books out of the five books on the bookshelf.'

(55)   Jiina-ga   motteiru (hon/no-no)   uti-no san-satu-no hon-ga
        Gina-Nom   has   book/Nmnl-Gen out-of 3-Cl-NO   book-Nom
        'Three books out of the books/what Gina has'

The analysis of Sauerland and Yatsushiro (2017) faces an empirical problem when we try to extend it to other data that they do not consider. In fact, there are many possible movement operations that they do not discuss, so there are many sentences whose deviation is unclear according to their analysis. In particular, the analysis has difficulty accounting for the derivation of sentences in which the part element has a numeral classifier and a head noun, and there are multiple possible word orders within the part element. For instance, consider (56).

(56)   Hondana-ni   atta   hon-no (uti-no) san-satu-no   hon-ga   nusumareta.
   bookshelf-on were   book-NO out-of three-Cl-NO book-Nom were.stolen
        'Three of the books on the bookshelf were stolen.'

---

[11] I thank Chizuru Nakao (p.c.) for bringing up the topic and providing the example in (55).

We can observe from (56) that both of the head nouns can be overt and that the part element can have the word order *san-satu-no hon-ga* 'three-Cl-NO book-Nom.' This kind of sentence has been of primary interest in my analysis and has been shown to be straightforwardly accounted for in the previous section. However, since Sauerland and Yatsushiro (2017) only consider examples in which the part element has the word order *hon-no san-satu-ga* 'book three-Cl-Case' for plain partitives, it is not clear how (56) is derived.

One possibility examined here is that *san-satu-no hon* 'three-Cl-NO book' is a reverse partitive that is embedded within another partitive construction and eventually works as the part element. In this case, the derivation should first start from constructing the reverse partitive *san-satu-no hon* 'three-Cl-NO book,' as in (57). The derivation up to this point is the same as that described earlier in (48) and (50).

(57)   Reverse partitive which eventually works as the part element
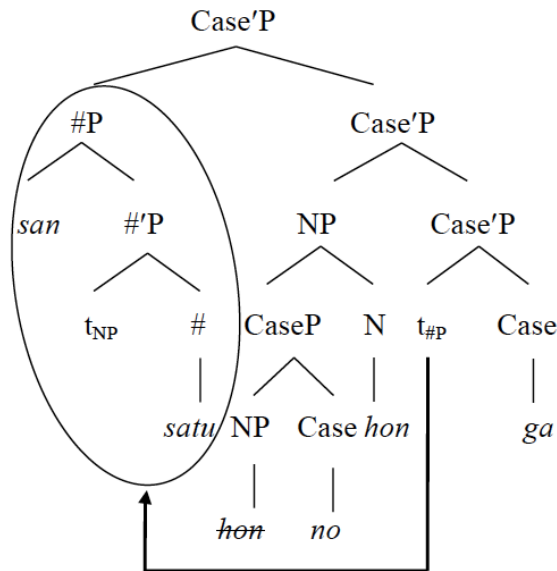
After the NP *hon-no hon* moves from #P, the NP *hon* within the whole element is deleted. As a result, the case marker *-no* has no host to attach to, and as a solution to rescue the derivation from ending in a clash, #P moves to the specifier position of QP in the part

element. Recall that a reverse partitive does not have a partitive reading. According to Sauerland and Yatsushiro (2017), this is because the deleted NP in the whole element is interpreted as some kind of unspecific noun, for example, *stuff*, and the part-whole relation marked by the case marker *-no* becomes vacuous.

As the next step to derive (56), the structure in (57) is embedded within another partitive construction as the part element. The only possible way to do this while retaining the part-whole relation between the part element and the whole element, as far as I understand Sauerland and Yatsushiro's (2017) analysis, is to place the whole element in the specifier position of the DP layer, which projects above the structure in (57). The result is the structure in (58).

(58)   Potential structure of (56)
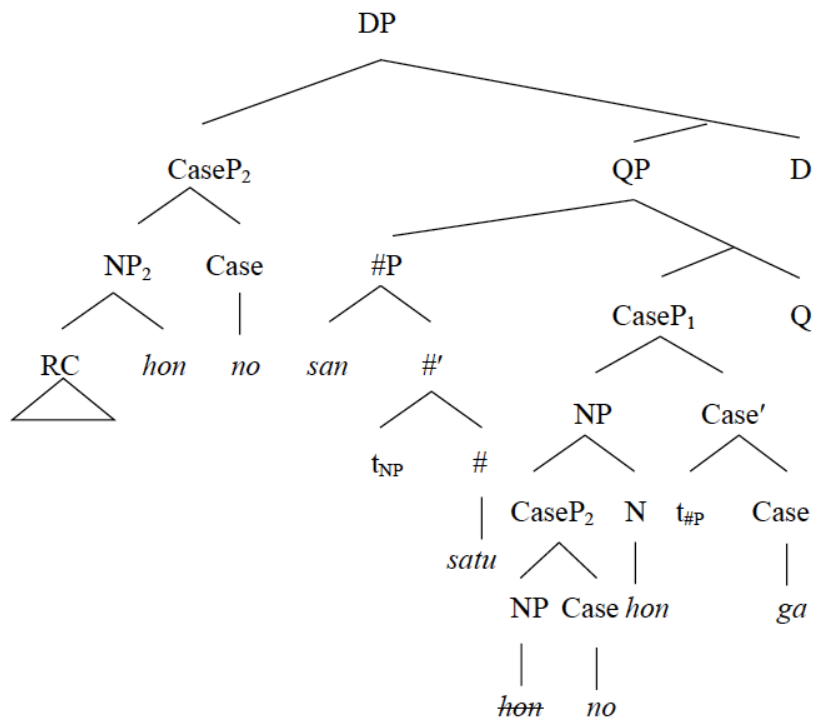
The structure includes the whole element within the DP projection which corresponds to the part element. The DP is taken to be the projection of the part element because, for one thing, in (49) and (50), the whole nominal is in the complement position of the CaseP of

the part element. Further, in (56), for example, the subject of the sentence is not (all of) the books on the bookshelf but three of them. It thus seems that a structure in which the part element projects, rather than the one in which the whole element projects, is more plausible.

The structure in (58), however, faces a problem of deriving the part-whole relation present in (56). If the part-whole relation is marked by *no* between the whole NP *hon* and the part N *hon* in their original analysis, it is unclear whether the upper *no* in (56) can correctly mark the part-whole relation, when it takes the upper NP_2 as the whole and QP as the part.

This section has shown that Sauerland and Yatsushiro's (2017) analysis faces problems in accounting for some numeral partitive data. My analysis presented in the previous section can accommodate the data problematic for their analysis, leading to the conclusion that it should be adopted.

4. Extending the Analysis to the *Either/or* Construction and AltQs

This section illustrates how my analysis of the syntactic structure of numeral partitives, proposed in Section 2, can be extended to the *either/or* and AltQ constructions, given the discussion in Section 1.2 regarding characteristics that numeral partitives and the *either/or* and AltQ constructions have in common. It is shown that the constructions exhibit the same behavior as numeral partitives, although the behavior of *dottika* 'either' and *dotti* 'which' deserves special attention.

4.1. The Either/or *Construction*

The *either/or* construction behaves similarly to numeral partitives, which indicates that it has the same structure as that of numeral partitives, with two DPs and an FP in between, although the position of *dottika* 'either' requires special attention. First, the *either/or* construction example in (59) can have the form in (60) in which both DP_{Part} and DP_{Whole} are fully realized with an NP, a numeral, a classifier, and a case particle. This structure is

claimed to be the underlying structure of (59).

(59) Taro-wa koohii ka kootya-no uti-no dottika-o nonda.

T-Top coffee or tea-Gen out-of either-Acc drank

'Taro drank either coffee or tea.'

(60) Taro-wa [[[koohii ka kootya-no futa-tu-no nomimono-no]$_{DP}$ uti-no]$_{FP}$

T-Top coffee or tea-NO two-Cl-NO drink-Gen out-of

[dottika hito-tu-no nomimono-o]]$_{DP}$ nonda.

either 1-Cl-NO drink-Acc drank

'Taro drank either one drink out of two drinks coffee or tea.'

(60) has the same interpretation as that of (59), except for the slight redundancy that (60) has when all words are pronounced. It is claimed that, as was the case with numeral partitives, the *either/or* construction has two full-fledged DPs, DP$_{Whole}$ and DP$_{Part}$. Furthermore, the NP and the numeral + classifier in the two DPs can be elided when they are recoverable from the rest of the sentence. In the case of (60), the noun *nomimono* 'drink' is the common property of the disjuncts coffee and tea, so it is recoverable and can be elided. The information of the numeral + classifier can also be recovered from the number of disjuncts and from the presupposition that *dottika* 'either' will pick up one member from a set. Thus, both the NP and the numeral + classifier in the two DPs are optional, and when everything is absent, the structure results in the simplest form in (59).

The structure proposed for (59) and (60) is in (61). It is essentially identical to that proposed for numeral partitives (e.g., (27b)), in which the DP including the DisjP *koohii ka kootya* 'coffee or tea' is DP$_{Whole}$, and the DP including *dottika* 'either' is DP$_{Part}$.
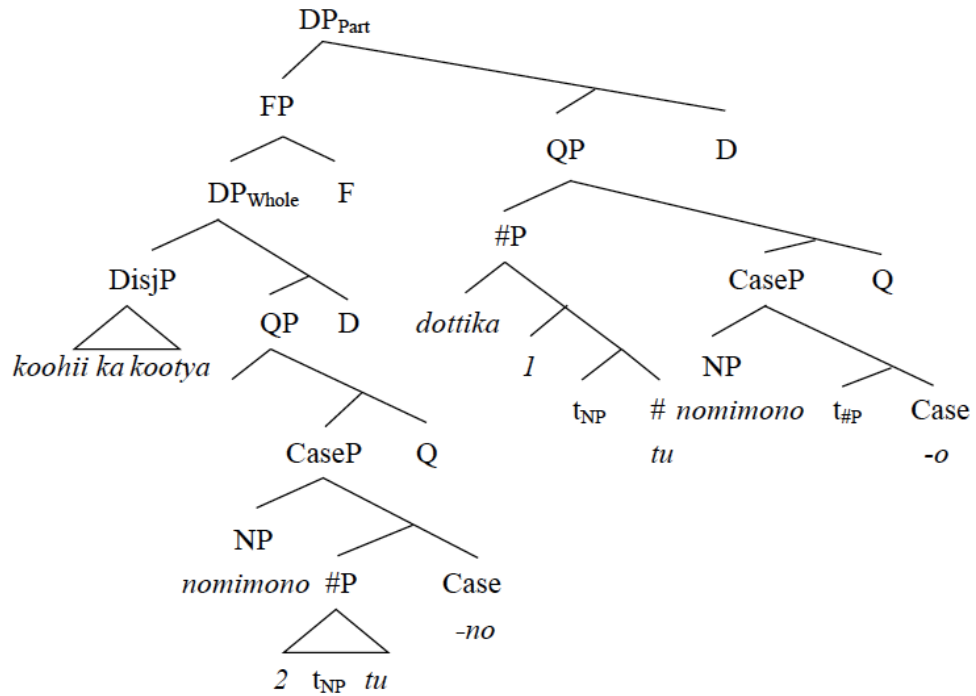
(61) Structure of (59) and (60)
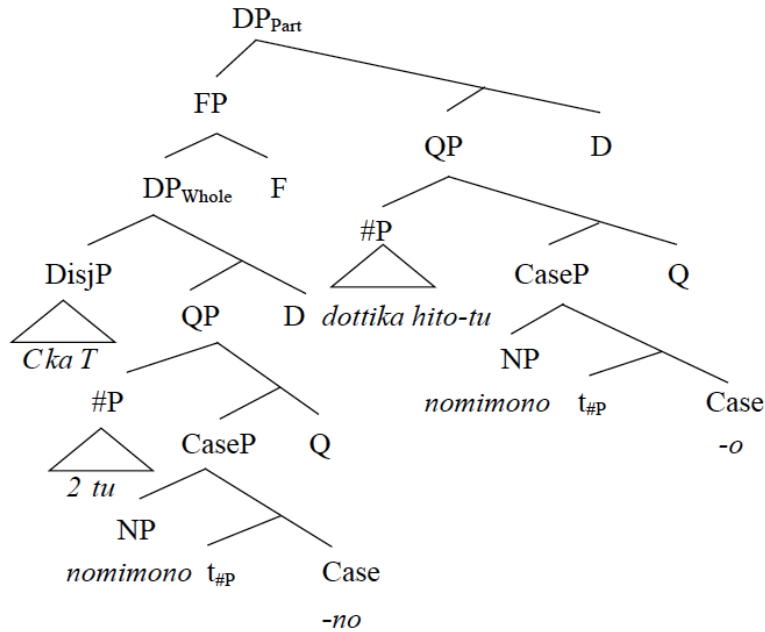
Note that *dottika* 'either' resides in the #P. The precise position of the item will be discussed later in this chapter.

Let us next move on to the second data set concerning multiple word orders in DP$_{Part}$ and DP$_{Whole}$. The *either/or* construction allows DP-internal movements to occur independently within DP$_{Whole}$ and DP$_{Part}$, just like numeral partitives. For example, in (62), only NP has moved in DP$_{Whole}$, while #P movement has further occurred in DP$_{Part}$. In (63), in contrast, only NP has moved in DP$_{Part}$, while #P movement has further occurred in DP$_{Whole}$.
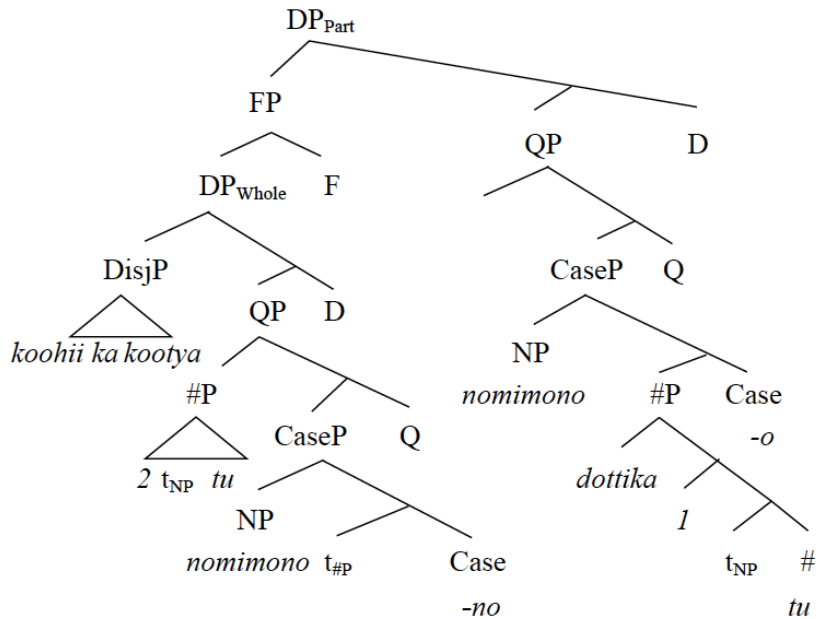
(62) a. Taro-wa [[[koohii ka kootya-no nomimono futa-tu-no]$_{DP}$ uti-no]$_{FP}$

T-Top   coffee or   tea-NO   drink   two-Cl-NO   out-of

[dottika hito-tu-no nomimono-o]]$_{DP}$ nonda.

either   1-Cl-NO   drink-Acc   drank

'Taro drank either one drink out of two drinks coffee or tea.'

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b. Structure of (62a)

DP_Part
├─ FP
│ ├─ DP_Whole
│ │ ├─ DisjP
│ │ │ └─ koohii ka kootya
│ │ └─ QP D
│ │   └─ QP Q
│ │   └─ CaseP
│ │   ├─ NP
│ │   │ nomimono
│ │   └─ #P Case
│ │   -no
│ │   2 t_NP tu
│ └─ F
├─ QP
│ └─ #P
│   ├─ dottika
│   │ 1
│   │ t_NP
│   └─ CaseP Q
│   ├─ NP
│   │ # nomimono t_#P
│   │ tu
│   └─ Case
│   -o
└─ D

(63) a. ? Taro-wa [[[koohii ka kootya-no futa-tu-no nomimono-no]_DP uti-no]_FP

T-Top   coffee or tea-NO   2-Cl-NO   drink-Gen   out-of

nomimono dottika hito-tu-o]_DP nonda.

drink   either   1-Cl-Acc   drank

'Taro drank either one drink out of the two drinks coffee or tea.'

b. Structure of (63a)

```
                          DP_Part
                         /      \
              FP                  \
             /  \              QP        D
      DP_Whole   F           /    \
       /    \              CaseP    Q
   DisjP     \            /    \
   /\         QP   D    NP      #P    Case
 koohii ka kootya  /\  nomimono /  \   -o
              #P    CaseP  Q  dottika  1  \
             /\    /    \                tNP   #
          2 tNP tu  NP    Case           tNP   tu
                   /  \
             nomimono t#P   Case
                            -no
```

As seen from the structures in (62b) and (63b), the *either/or* construction behaves in the same way as numeral partitives and is analyzed with the same syntactic structure and DP-internal movements, except for the position of *dottika* 'either.'

Another property concerning word order that the *either/or* construction has in common with numeral partitives is the unavailability of the movement of CaseP within DP_Whole from (63a), as in (64a), or in DP_Part from (62a), as in (64b).

(64) a. ?*Taro-wa [[koohii ka kootya-no [CaseP **nomimono t#P -no**] futa-tu tCaseP]DP

 T-Top coffee or tea-NO drink-Gen 2-Cl

 (uti-no) (nomimono) dottika hito-tu-o]DP nonda.

 out-of drink either 1-Cl-Acc drank

 'Taro drank either one drink out of the two drinks coffee or tea.'

b. ?*Taro-wa [[koohii ka kootya-no nomimono futa-tu-no]$_{DP}$ (uti-no)

    T-Top   coffee or tea-Gen   drink   two-Cl-NO   out-of

    [$_{CaseP}$ **nomimono t$_{\#P}$-o**] dottika hito-tu t$_{CaseP}$]$_{DP}$ nonda.

        drink-Acc   either 1-Cl   drank

    'Taro drank either one drink out of coffee or tea.'

Recall from the discussion in (31a,b) that the unacceptability of CaseP-movement within DP$_{Whole}$ originates from the ban on the movement of CaseP with a genitive case, while that of CaseP-movement within DP$_{Part}$ originates from mismatch of specificity. We can analyze the unacceptability of (64a,b) in the same way as (31a,b), which shows the similarity between the two constructions.

We next consider the problem of *dottika* 'either.' There are two aspects of the position of *dottika* 'either' that require consideration: whether *dotti* and *ka* occupy distinct positions and the nature of its relationship to the numeral + classifier. Let us begin with the first problem.

The first problem is related to the nature of indeterminate phrases. Indeterminate phrases are, as Nishigauchi (1990) and Shimoyama (2001), among others, have proposed, combinations of NPs that do not have quantificational force by themselves and particles that quantify over them, such as a question particle in the sentence-final position (*ka*), a universal particle (*mo*), or an existential particle (*ka*). Depending on what quantifies over the NP, the indeterminate phrase changes its meaning, as shown in the table below.

(65)   Paradigm of indeterminate phrases (Shimoyama (2006: 143))

Interrogative	Universal	Existential
dare…ka 'who'	*dare-mo* 'everyone'	*dare-ka* 'someone'
nani…ka 'what'	(*nani-mo*)	*nani-ka* 'something'

Previous literature has observed that in indeterminate phrases that accompany the universal particle *mo* or the existential particle *ka*, the restrictor NP can associate with the particle in a long-distance manner (Nishigauchi (1990), Takahashi (2002), and Shimoyama (2006), among others). For example, the universal particle *mo* can either attach to the NP with which it is associated, as in (66a), or be in a separated position with a complex NP island between them, as in (66b). This long-distance association is somewhat difficult for the existential particle *ka*, as shown in (67).[12]

(66) a. **Dono gakusei-mo** odotta.

   which student-MO danced

   'Every student danced.'

   b. [[**Dono gakusei**-ga syootaisita] sensei]-**mo** odotta.

   which student-Nom invited teacher-MO danced

   'For every student x, the teacher(s) that x had invited danced.'

                                        (Shimoyama (2006: 139))

(67) a. **Dare**-kara-**ka** henna tegami-ga todoita.

   who-from-KA strange letter-Nom arrived

   'A strange letter came from God knows who.'   (Nishigauchi (1990: 121-122))

   b. ? [**Dono gakusei**-no hon]-**ka**-o karita.

   which student-Gen book-KA-Acc borrowed

   '(I) borrowed some student's book.'

---

[12] Takahashi (2002) judges (ib), in which the indeterminate and *ka* are in a nonlocal relation, as grammatical. The sentence does not sound very good to me, however, whereas (ia) with the indeterminate and *ka* in a local relation sounds perfect to me.
(i) a. [[Dare ka-o hihansita] tyoodo hanbun-no gakusei]-ga taihosareta.
    person KA-Acc criticized exactly half-Gen student-Nom were-arrested
    'Exactly half the students that criticized someone were arrested.'
  b. [[Dare-o hihansita] tyoodo hanbun-no gakusei ka](-ga) taihosareta.
    person-Acc criticized exactly half-Gen student KA-Nom were-arrested
    'literally: Some exactly half the students that criticized a person were arrested.'
                                        (Takahashi (2002: 609))

c. ??[[**Dono gakusei**-ga   katta]   hon]-**ka**-o   karita.

which   student-Nom bought book-KA-Acc borrowed

'(I) borrowed a book that some student had bought.'   (Shimoyama (2006: 144))

Because of this long-distance association between the NP and the quantificational particle, researchers have proposed several lines of analysis, for example, a movement analysis in which either the NP or the quantificational particle moves (Nishigauchi (1990), Takahashi (2002), among others), and an in-situ analysis in which various interpretations are derived solely through semantics (Shimoyama (2006)).

Dottika 'either' in the *either/or* construction is also an indeterminate phrase. It consists of *dotti* and *ka*, the first part being an indeterminate and the second part being an existential particle. Thus, *dotti*, which has a meaning similar to *either* when the existential particle *ka* is attached as in (68a), is a *wh* phrase in questions and gives rise to an AltQ meaning in (68b) and means something like *both* when *mo* is attached as in (68c).

(68)a. Taro-wa   koohii ka kootya-no dottika-o   nonda.

T-Top   coffee or tea-Gen   either-Acc drank

'Taro drank either coffee or tea.'

b. Taro-wa   koohii ka kootya-no dotti-o   nonda no?

T-Top   coffee or tea-Gen   which-Acc drank Q

'Which did Taro drink: coffee or tea?'

c. Taro-wa [John to   Mary (to)](-no dottimo)-o hihansita.

T-Top   J   and M   and-NO both-Acc   criticized

'Taro criticized both John and Mary.'

In the *either/or* construction, the position of *ka* is much more restricted than that in other sentences shown in (67). As stated above, DP$_{Part}$ can contain *dottika* 'either' and the

noun that denotes the common property of the disjuncts, as exemplified in (69a). In this situation, the existential particle cannot be in a position separate from *dotti*, as shown in (69b,c).

(69) a. Taro-wa [[[koohii ka   kootya-no]_{DP} (uti-no)]_{FP} [dottika-no nomimono-o]]_{DP}

        T-Top   coffee or   tea-NO   out-of   either-NO   drink-Acc

        nonda.

        drank

        'Taro drank either drink out of coffee or tea.'

   b. *?Taro-wa [[[koohii ka   kootya-no]_{DP} (uti-no)]_{FP} [**dotti**-no   nomimono-**ka**-o]]_{DP}

        T-Top   coffee or   tea-NO   out-of   which-NO drink-KA-Acc

        nonda.

        drank

   c. *?Taro-wa [[[koohii ka   kootya-no]_{DP} (uti-no)]_{FP} [**dotti**-no   nomimono-o]-**ka**]_{DP}

        T-Top   coffee or   tea-NO   out-of   which-NO drink-Acc-KA

        nonda.

        drank

Based on the discussion so far, it is claimed that movement of *dotti* or *ka* does not take place in this construction and that *dottika* 'either' as a whole stays in its base-generated position.

Next, the structural relation between *dottika* 'either' and the numeral + classifier is examined. *Dottika* 'either' can cooccur with a numeral classifier, as in (70). The numeral classifier is available in only one position, namely, directly following *dottika* 'either,' at least in the reading where the numeral expresses the number of the elements that *dottika* 'either' picks up.

(70) Taro-wa **(*hito-tu)** koohii ka kootya-no **(*hito-tu)** **dottika** (**hito-tu**)-o

T-Top 1-Cl coffee or tea-NO 1-Cl either 1-Cl-Acc

nonda.

drank

'Taro drank either (one of) coffee or tea.'

Dottika 'either' chooses from two options, so it always picks up one element. This is why the numeral can only be *one*. The most general classifier *tu* is used in this case, reflecting the partitive reading in which Taro chose one of the two kinds of drinks (and not two glasses of drinks).[13] Other syntactic variations maintaining the basic word order are also possible here (cf. (8b,c)), but importantly, the same restriction regarding the position of the numeral

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[13] The range of classifiers that can be used with numerals is one point where "common noun" partitives and "proper noun" partitives differ. As we observe from the contrast between (i) and (ii), common noun partitives are degraded with classifiers with specific semantic content, such as *satu* (used for books), while proper noun partitives are fine with any classifiers as long as they match the counted noun. (Note that if the nouns in (i) refer to specific novels and collections of poems, rather than to novels and poems as kinds of literature, the sentence is acceptable.)
(i)?* Taro-wa syoosetu ka sisyuu-no dottika **i-ssatu**-o yonda.
    T-Top novel or collected.poem-NO either 1-Cl-Acc read
    'Taro read either one of novels or collections of poems.'
(ii) Taro-wa LGB ka MP-no dottika **i-ssatu**-o yonda.
    T-Top LGB or MP-NO either 1-Cl-Acc read
    'Taro read either one of LGB or MP.'
This behavior seems to come from the semantic property of the two partitives. Common noun partitives in (i) denote picking up one from two kinds of literature, and thus the classifier *satu*, which counts individual books, cannot be used. Proper noun partitives in (ii), however, have two specific books as disjuncts, and thus using *satu* is unproblematic.
  Note that, *ippoo* 'one of' and *katahoo* 'one of' can replace *dottika i-ssatu* 'either 1-Cl' and result in an acceptable common noun partitive example as in (iii), while the items cannot be used in proper noun partitives as in (iv). This discrepancy may occur because the morpheme *hoo*, which is combined with *i* '1' and *kata* 'one,' has a vague meaning like "way" or "thing" and thus pairs well with common noun partitives but not with proper noun partitives.
(iii) Taro-wa syoosetu ka sisyuu-no {**ippoo/katahoo**}-o yonda.
    T-Top novel or collected.poem-NO one.of-Acc read
    'Taro read one of novels or collections of poems.'
(iv)?* Taro-wa LGB ka MP-no {**ippoo/katahoo**}-o yonda.
    T-Top LGB or MP-NO one.of-Acc read
    'Taro read one of LGB or MP.'

classifier obtains here.[14]

(71) a.　Taro-wa **(*hito-tu)**　koohii ka kootya(,)**(*hito-tu) dottika　(hito-tu)-o**　nonda.

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(NP + Q + Case)

　b.　Taro-wa **(*hito-tu)**　koohii ka kootya-o **(*hito-tu) dottika　(hito-tu)**　nonda.

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(NP + Case + Q)

From (70) and (71), *dottika* 'either' is analyzed as modifying the numeral in the #P. Further, combining this with the claim made earlier that *dottika* 'either' as a whole stays in its base-generated position, the structure in (72) is proposed for *dottika hito-tu* 'either one.'

(72)　　#P with *dottika* 'either' modifying the numeral
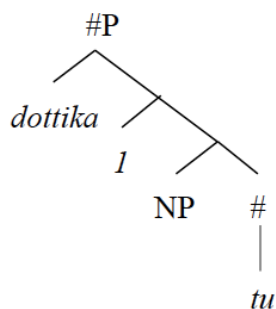
Dottika 'either' is in the Spec#P position and modifies the numeral. The numeral classifier modified by *dottika* 'either' goes through DP-internal movements just like the #P in numeral partitives, as instantiated in the structures shown above in (62b) and (63b).

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[14]　Another difference between common noun partitives and proper noun partitives concerns word order. Proper noun partitives, as exemplified in (i), do not allow the word order DisjP + *dottika* + case + numeral classifier.
(i) # Taro-wa LGB ka MP-no 　dottika-o 　**ni-satu** yonda.
　　T-Top 　LGB 　or 　MP-NO 　either-Acc 2-Cl 　read
　　'Taro read two copies of LGB or two copies of MP.'
This behavior is also explained by the fact that proper noun partitives have proper nouns/individuals as disjuncts. Since the disjuncts denote individuals, it is not possible for the numeral to express the number of the books, unless the sentence is uttered under a situation in which Taro read two copies of the same book or two books in a series of books.

Finally, let us turn to the third set of data: examples without a partitive reading. As was the case with numeral partitives, we predict that in the *either/or* construction too, DP$_{\text{Whole}}$ does not have to be generated since DP$_{\text{Whole}}$ and DP$_{\text{Part}}$ are independently projected. (73) is such an example. The sentence is degraded when it is uttered out of the blue.

(73)?* Dottika-no nomimono-o nonde ii yo.

       either-NO drink-Acc drink can SFP

       'You can drink either of the drinks.'

The sentence is degraded without prior context because, as will be discussed in Chapter 3, *dottika* 'either' invokes a presupposition that there are two options in the context. If we add some details to the sentence, as in (74), the judgment improves, but the sentence still requires two salient options in the context.

(74) Dottika-no koodo-o kiru to bakudan-o kaijyo dekiru.

       either-NO cord-Acc cut if bomb-Acc deactivate can

   'Cutting either cord will deactivate the bomb.'

This section has described how the present proposal is applicable to the *either/or* construction. Although the structural position of *dottika* 'either' requires special attention, the rest of the construction shows the same behavior as numeral partitives, and the analysis for numeral partitives is directly extended to the *either/or* construction. The main data of partitives introduced in Section 2.1 and the phenomena observed in the *either/or* construction are summarized in Table 2.

Table 2: Data of the *either/or* construction

Properties		Partitives	*Either/or*
Both DP$_{Part}$ and DP$_{Whole}$ can have an overt head noun, a numeral, and a classifier		(20a)	(60)
Multiple word orders are possible in DP$_{Part}$ and DP$_{Whole}$ independently	A numeral and a classifier can apprar in front of or between NP and Case	(25)-(28)	(62a), ?(63a)
	A numeral and a classifier cannot follow NP+Case	?*(31)	?*(64)
There are examples with only a single occurrence of head noun, a numeral, and a classifier, which do not have a partitive reading		(30)	?*(73)

Before closing this section, the syntactic structure of DisjPs assumed here is described. A syntactic structure in (75) is adopted for DisjPs in Japanese, following the claim of Jayaseelan (2014) and Mitrović and Sauerland (2016) that there are two operators/morphemes involved in coordination.

(75)   The structure of a DisjP in Japanese
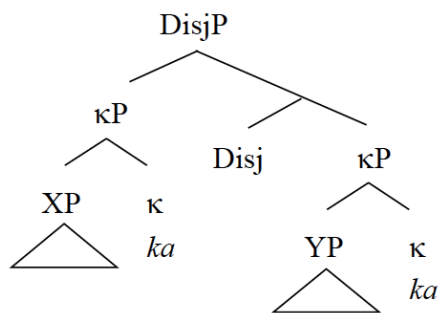
The structure in (75) is based on that of Mitrović and Sauerland (2016). As reviewed in Chapter 1, they give a decomposed structure (76) for the Japanese phrase involving the conjunction *Bill mo Mary mo* 'Bill and Mary.'

(76)   Structure of *Bill mo Mary mo* 'Bill and Mary'
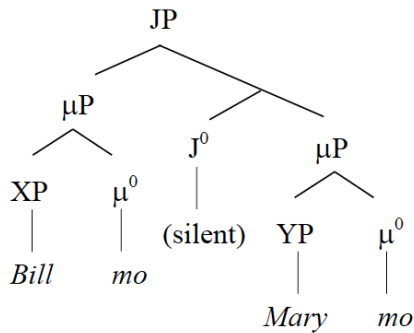
```
                    JP
              ┌──────┴────────┐
          μP              ┌───┴────┐
        ┌──┴──┐         J⁰        μP
      XP      μ⁰        │       ┌──┴──┐
      │       │      (silent)  YP    μ⁰
    Bill     mo                │      │
                             Mary    mo
```
                                              (Mitrović and Sauerland (2016: 477))

The structure in (75) is assumed in the subsequent chapters, where the semantics of Japanese and the syntax and semantics of English are discussed. The structure enables us to account for the fact that Japanese *ka* 'or' can attach to all disjuncts and that it follows the disjuncts, whereas English *and* appears only once and is placed between the disjuncts.

The next section turns to AltQs and shows that this construction is also subject to the same syntactic analysis as the *either/or* construction, although in AltQs a numeral and a classifier cannot appear overtly. This phenomenon is also observed in other *wh* questions, and it is suggested that it might be related to the nature of AltQs as a form of *wh* question using a *wh* phrase.

4.2.   Alternative Questions

AltQs behave in a similar manner to numeral partitives and the *either/or* construction in terms of the full form of DPs, multiple word orders in DPs, and examples without a partitive reading. First, AltQs can have a fully realized DP$_{Part}$ and DP$_{Whole}$, as shown in (77). Note that a numeral classifier cannot appear in DP$_{Part}$. This point will be discussed later.

(77)   Taro-wa koohii ka kootya-no futa-tu-no nomimono-no uti-no dotti

        T-Top   coffee or tea-Gen   2-Cl-NO drink-Gen   out-of which

        (*hito-tu)-no nomimono-o nonda no?

        1-Cl-NO   drink-Acc   drank Q

        'Which drink out of coffee or tea did Taro drink?'

Second, AltQs allow multiple word orders within the two DPs. For example, NP-movement has taken place in DP$_{Whole}$, and #P-movement has further occurred in DP$_{Part}$ in (78), whereas in (79), only NP-movement has taken place in DP$_{Part}$, and #P movement has further occurred in DP$_{Whole}$. Movement of CaseP inside DP$_{Whole}$ is not allowed, as in (80

(78)   Taro-wa [[[koohii ka   kootya-no nomimono futa-tu-no]$_{DP}$ uti-no]$_{FP}$

        T-Top   coffee or tea-NO   drink   two-Cl-Gen out-of

        [dotti-no   nomimono-o]]$_{DP}$ nonda no?

        which-NO drink-Acc   drana Q

        'Which drink out of coffee or tea did Taro drink?'

(79)?? Taro-wa [[[koohii ka   kootya-no   futa-tu-no nomimono-no]$_{DP}$ uti-no]$_{FP}$

        T-Top   coffee or tea-NO   2-Cl-NO drink-Gen   out-of

        nomimono dotti-o]$_{DP}$ nonda no?

        drink   which-Acc drank Q
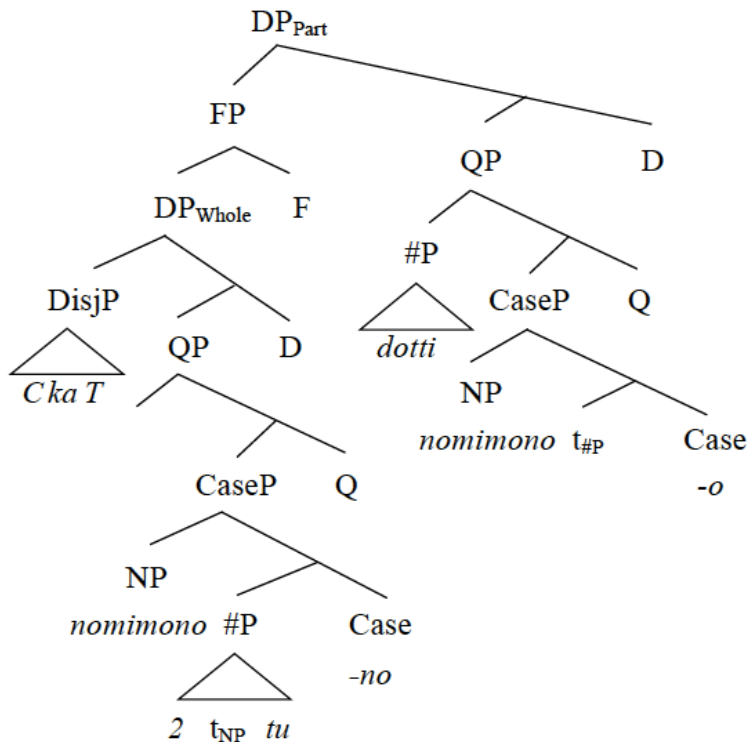
        'Which drink out of coffee or tea did Taro drink?'

(80)?* Taro-wa [[[koohii ka   kootya-no **[$_{CaseP}$ nomimono   t$_{\#P}$ -no]** futa-tu t$_{CaseP}$]$_{DP}$

        T-Top   coffee or tea-NO   drink-Gen   2-Cl

        uti-no]$_{FP}$ dotti-no   nomimono-o]$_{DP}$ nonda no?

        out-of   which-NO drink-Acc   drank Q

        'Which drink out of coffee or tea did Taro drink?'

Third, *dotti* 'which' in AltQs shows the same behavior as *dottika* 'either' in that it cannot be used within a single DP without any context. (cf. (73)) As was the case with *dottika* 'either,' *dotti* 'which' invokes a presupposition that there are two options in the context. Thus, (81) is degraded when it is uttered out of the blue.

(81) ?* Dotti-no   nomimono-o nonde ii   no?

      which-NO drink-Acc   drink   can Q

      'Which drink can I drink?'

From the data set introduced above, it is claimed that the structure proposed for the *either/or* construction is directly extended to AltQs, as in the structure of (78) in (82).

(82)   Structure of (78)

However, recall that AltQs differ from the *either/or* construction in terms of the

possibility of cooccurrence with numeral classifiers, as we have observed in (77), which is repeated below.

(77)   Taro-wa koohii ka kootya-no futa-tu-no nomimono-no uti-no dotti

T-Top   coffee or tea-Gen   2-Cl-NO   drink-Gen   out-of which

(*hito-tu)-no nomimono-o nonda no?

1-Cl-NO   drink-Acc   drank Q

'Which drink out of coffee or tea did Taro drink?'

Dotti 'which' picks one of two options in a manner similar to *dottika* 'either.' It can be accompanied by an NP that denotes the common property of the disjuncts in DP$_{Whole}$, as in (77). However, unlike *dottika* 'either,' it cannot cooccur with a numeral classifier that indicates the number of options that it picks up.[15] In AltQs, *dotti* 'which' is in the Spec#P position, as was the case with *dottika* 'either,' but the numeral cannot be overt. It is assumed, however, that there is a covert numeral classifier *hito-tu* '1-Cl' within the #P, since *dotti*

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[15] As Chizuru Nakao (p.c.) observes, (i) has roughly the same meaning as (77), and the judgment improves compared to (77) with the numeral classifier. The sentence makes use of *dono*, which can accompany a numeral classifier.
(i) ? Taro-wa koohii ka kootya-no uti-no dono hito-tu-no nomimono-o
       T-Top   coffee or tea-Gen   out-of which 1-Cl-NO   drink-Acc
       nonda no?
       drank Q
       'Which one drink out of coffee or tea did Taro drink?'
The slightly degraded status of (i) might originate from the fact that *dotti* 'which' is usually chosen over *dono hito-tu* 'which one' when one of two options is selected. This is because *dotti* 'which' invokes a presupposition that there are two options in the context, whereas there is no such restriction on *dono*. Thus, in a situation where one of two options is explicitly selected, for example in (i), using *dotti* 'which' rather than *dono* is preferred, even though restrictions on *dotti* 'which' do not allow it to be used with a numeral classifier. In other situations, for example when we select two of three options, as in sentence (ii), using *dono futa-tu* 'which two' is more natural than *dono hito-tu* 'which one' in (i).
(ii) Taro-wa koohii ka   kootya ka jyuusu-no uti-no dono futa-tu-no
       T-Top   coffee or   tea   or juice-Gen out-of which 2-Cl-NO
       nomimono-o nonda no?
       drink-Acc   drank Q
       'Which two drinks out of coffee, tea, or juice did Taro drink?'

'which' can only pick one element. (This assumption is also made in Chapter 3, where the semantics of the Japanese constructions considered in this chapter is discussed.)

In fact, the behavior exemplified by *dotti* 'which' is not a property restricted to *dotti* 'which' but is widely displayed in other *wh*-phrases. Both *dare* 'who' in (83a) and *nani* 'what' in (83b) disallow a numeral classifier that denotes the number of people/things.[16] An exception is *dono* 'which' used with NPs in (83c). In general, we can maintain that *wh*-phrases do not cooccur with numeral classifiers.

(83) a. Dare (#hito-ri)-ga   kita   no?

      who   1-Cl-Acc   came   Q

      'Who came?'

   b. Taro-wa   nani (#hito-tu)-o   yonderu   no?

      T-Top   what   1-Cl-Acc   reading   Q

      'What is Taro reading?'

   c. Dono futa-ri-no gakusei-ga   kita   no?

      which 2-Cl-NO   student-Nom came   Q

      'Which two students came?'

Another point in which quantifiers such as *dottika* 'either' and *wh* words such as *dotti* 'which' differ from each other is the possibility of floating. As in (84a), *dottika* 'either' can occupy a position to the right of the case particle. (This floating behavior is highly restricted

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[16] *Dare hito-ri* 'who 1-Cl' and *nani hito-tu* 'what 1-Cl' have an NPI-like meaning in (i), distinct from the *wh* meaning under discussion. (See Watanabe (2006) on the minimizer use of *dare hito-ri* 'who 1-Cl' and *nani hito-tu* 'what 1-Cl.')
(i) a. Dare hito-ri gakusei-ga   hon-o   yom-anakat-ta.
    who 1-Cl   student-Nom book-Acc read-Neg-Past
    'Not a single student read books.'
  b. Gakusei-ga   nani hito-tu hon-o   yom-anakat-ta.
    student-Nom what 1-Cl   book-Acc read-Neg-Past
    'The students read not a single book.'   (Kishimoto (2007: 264))

compared to English *either*, as discussed in detail in Chapter 4.) (84b) shows that floating is impossible for *dotti* 'which.'

(84) a. ? Taro-ga [_DisjP_ koohii ka kootya]-o dottika nonda.

          T-Nom   coffee or tea-Acc   either   drank

          'Taro drank either coffee or tea.'

    b. * Taro-ga [_DisjP_ koohii ka kootya]-o dotti nonda no?

          T-Nom   coffee or tea-Acc   which drank Q

          Intended: 'Which did Taro drink: coffee or tea?'

          Other indeterminate items show this contrast between an existential quantifier and a *wh* word, for example, *dareka* 'someone' vs. *dare* 'who' in (85) and *nanika* 'something' vs. *nani* 'what' in (86).

(85) a. Gakusei-ga dareka kita.

          student-Nom someone came

          'Some student came.'

    b. * Gakusei-ga dare kita no?

          student-Nom who   came Q

          Intended: 'Who (student) came?'

(86) a. Taro-ga purezento-o nanika katta.

          T-Nom   present-Acc something bought

          'Taro bought some present.'

    b. * Taro-ga purezento-o nani katta no?

          T-Nom   present-Acc what bought Q

          Intended: 'What did Taro buy for a present?'

So far, it has been shown that AltQs behave similarly to numeral partitives and the *either/or* construction and can be accounted for through the same syntactic analysis for both constructions. It has also been pointed out that the behavior of AltQs different from the *either/or* construction is displayed in other *wh* questions.

Before closing this section, a restriction on the word order shared by numeral partitives, the *either/or* construction, and AltQs is examined. As in (10d) and (12), which are repeated below, the part element cannot precede the whole element. Thus, (10d) does not have a partitive reading in which *san-satu* '3-Cl' modifies the silent part noun and (12a,b) are both unacceptable.

(10) d. # Taro-wa   san-satu(-no/o)   hondana-ni   atta   hon-no/o   yonda.

       T-Top   3-Cl-Gen/Acc   bookshelf-on   were   book-Gen/Acc   read

       '(Intended) Taro read three of the books on the bookshelf.'

(12) a. * Taro-wa dottika(-no) [$_{DisjP}$ koohii ka kootya]-o nonda.

       T-Top   either-NO   coffee or tea-Acc   drank

   b. * Taro-wa dotti(-no) [$_{DisjP}$ koohii ka kootya]-o nomi-masi-ta   ka?

       T-Top   which-NO   coffee or tea-Acc   drink-Pol-past Q

It is possible to account for this data by claiming that the QP-movement involved in this word order is not allowed. The structure of (10d) is as in (87), on the assumption that no DP-internal movement other than the obligatory NP-movement and the movement of QP in DP$_{Part}$ has taken place.

(87)   Structure of (10d)
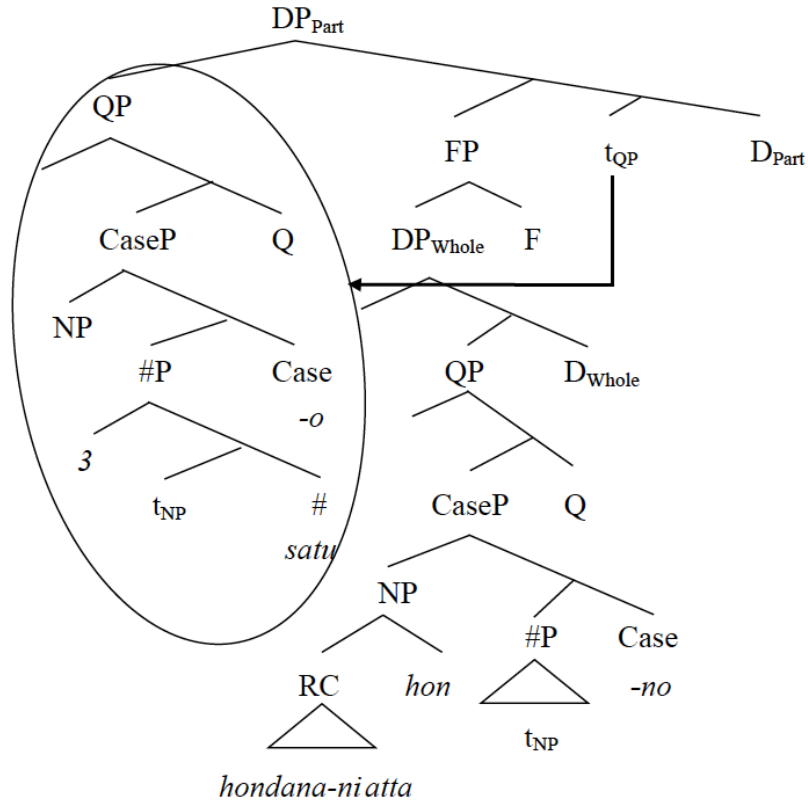
As Shoichi Takahashi (p.c.) observes, the QP that moves in structure (87) cannot move to a higher position in the clause level, as shown in (88a). This restriction contrasts with (88b), in which FP-movement to a clause level position is allowed.

(88) a. * San-satu-o Taro-wa hondana-ni   atta   hon-no   uti(-no) yonda.

   3-Cl-Acc   T-Top   bookshelf-on were book-Gen out-of read

   '(Intended) Taro read three of the books on the bookshelf.'

   b. Hondana-ni   atta hon-no   uti(-no) Taro-wa san-satu-o yonda.

   bookshelf-on were book-Gen out-of   T-Top   3-Cl-Acc   read

   'Taro read three of the books on the bookshelf.'

The fact that QP cannot be moved to the Spec,DP$_{Part}$ position or a clause-level position

indicates that some problem exists in the QP-movement itself. The problem might reside in the Spec,DP$_{Part}$ position in (87), by which all movements from DP-internal positions have to stop, since DP is a phase and Spec,DP is an escape hatch. As Akira Watanabe (p.c.) suggests, if DPs cannot have multiple specifiers, the Spec,DP$_{Part}$ position that QP moves to in (87) is an outer specifier position, so it cannot be used as an escape hatch. If so, it is impossible for QP to move further to a clause-level position, as in (88a). The same line of reasoning can also be applied to the *either/or* and AltQ constructions.

To summarize the discussion in this section, the data of partitives introduced in Section 2.1 and the phenomena observed in the *either/or* and AltQ constructions are summarized in Table 3.

Table 3: Data of numeral partitives and the *either/or* and AltQ constructions

Properties		Partitives	*Either/or*	AltQs
Both DP$_{Part}$ and DP$_{Whole}$ can have an overt head noun, a numeral, and a classifier		(20a)	(60)	(77)
Multiple word orders are possible in DP$_{Part}$ and DP$_{Whole}$ independently	A numeral and a classifier can apprar in front of or between NP and Case	(25)-(28)	(62a), ?(63a)	(78), ??(79)
	A numeral and a classifier cannot follow NP+Case	?*(31)	?*(64)	?*(80)
There are examples with only a single occurrence of head noun, a numeral, and a classifier, which do not have a partitive reading		(30)	?*(73)	?*(81)

The impossibility of numeral classifiers in DP$_{Part}$ and the impossibility of floating for *dotti* 'which' are only observed in AltQs. The data are summarized in Table 4.

Table 4: Phenomena only observed in AltQs

Properties	*Either/or*	AltQs
A numeral and a classifier can/cannot be overt in DP$_{Part}$	(60)	*(77)
Dottika/dotti 'either/which' can/cannot float to a position following DisjP+Case	?(84a)	*(84b)

This section has demonstrated that the syntactic structure proposed for numeral partitives can also account for the *either/or* and AltQ constructions. Although at first glance the two constructions seem to have a simple structure, namely, a DisjP and *dottika/dotti* 'either/which' connected by *no*, they actually have a hierarchical structure with two DPs and an FP between them. The next section turns to some complications and observations and describes them in further detail.

5. Further Issues

There are some complicated problems that have been left out of the discussion so far. The first is the possible word orders of partitives whose structures are unclear. There are also some points that deserve attention concerning the possible forms of the *either/or* and AltQ constructions. Since the restrictor NP in indeterminate phrases has different forms depending on whether the referent is human or nonhuman, singular or plural, etc., there are other items that can replace *dottika* 'either' when the disjuncts or the whole element are human or nonhuman, the number of disjuncts is two or three, etc. The constructions also allow forms in which the disjunction is replaced with conjunction. These topics are discussed in turn.

5.1. *The Floating Behavior of Numerals in Partitives*

Sentences with the word order in (7a) have been the primary focus of the discussion so far, but what about the word orders in (7b,c)? How many DPs are there in the sentences,

and, if DP$_{Part}$ and DP$_{Whole}$ exist in these sentences too, where is the boundary between the two DPs?

(7) a. Taro-wa hondana-ni atta hon-no #(uti-no) san-satu-o yonda.

$\qquad$ (NP-*no* + *uti-no* + Q + Case)

$\qquad$ T-Top bookshelf-on were book-NO out-of three-Cl-Acc read

$\qquad$ 'Taro read three of the books on the bookshelf.'

$\quad$ b. Taro-wa hondana-ni atta hon san-satu-o yonda. (NP + Quantifier + Case)

$\quad$ c. Taro-wa hondana-ni atta hon-o san-satu yonda. (NP + Case + Quantifier)

For (7c), the structure can be made slightly more explicit by adding a numeral classifier, as in (89).

(89) $\quad$ Taro-wa hondana-ni atta go-satu-no hon-o san-satu yonda.

$\qquad$ T-Top bookshelf-on were 5-Cl-NO book-Acc three-Cl read

$\qquad$ 'Taro read three of the five books on the bookshelf.'

The resulting sentence drives us to consider this sentence as containing both a DP$_{Part}$ and a DP$_{Whole}$, but the boundary between the two DPs remains unclear. From the word order, we cannot judge whether *hon-o* 'book-Acc' is in the DP$_{Whole}$ or DP$_{Part}$.

$\quad$ There is evidence that *hon-o* 'book-Acc' is indeed in DP$_{Whole}$, however. Recall that CaseP in DP$_{Part}$ cannot undergo remnant movement to Spec,DP$_{Part}$, as in (31b), for specificity reasons. This restriction means that the word order *hon-o san-satu* 'book-Acc 3-Cl' is not allowed in this sentence. However, this is precisely the word order of DP$_{Part}$ in (89) if *hon-o* 'book-Acc' were in DP$_{Part}$.

(31) b. *?Taro-wa [[hondana-ni atta   go-satu-no hon-no]$_{DP}$ (uti-no) **[$_{CaseP}$ hon-o]** san-satu

t$_{CaseP}$]$_{DP}$ yonda.

It is therefore claimed that (89) has the structure in (90), leaving for further investigation how the part-whole relation between the two DPs is obtained. Since *uti-no* 'out of' cannot be overt between the two DPs in this sentence, and nothing other than the elements in the #P is overt within DP$_{Part}$, the precise structure of the sentence is difficult to determine.

(90)   Taro-wa [$_{DPWhole}$ hondana-ni   atta   go-satu-no   hon-o]   [$_{DPPart}$ san-satu]

T-Top   bookshelf-on were 5-Cl-NO   book-Acc   three-Cl

yonda.

read

'Taro read three of the five books on the bookshelf.'

The discussion above also leads to the conclusion that Sauerland and Yatsushiro's (2017) assumption that *-no* always marks the part-whole relation and thus it always indicates the right edge of the whole element is untenable, since *-no* is not placed between the two DPs in (90).

In contrast, the structure of (7b) remains a mystery. The existence of two DPs is difficult to verify since adding another numeral classifier leads to a degraded sentence, as in (91). The numeral classifier *go-satu* '5-Cl' in (91) is intended to modify the covert whole noun (if one exists), but the resulting sentence is unacceptable for me.

(91) ?* Taro-wa   hondana-ni   atta   go-satu-no   hon   san-satu-o   yonda.

T-Top   bookshelf-on were 5-Cl-NO   book   three-Cl-Acc read

'Taro read three of the five books on the bookshelf.'

It might be possible to explain (7b) by claiming that *uti-no* 'out of,' placed between *hon* 'book' and *san-satu* '3-Cl,' is deleted. This explanation, however, is also problematic since deletion of a genitive case marker, which should also be present with *uti-no* 'out of,' is generally not allowed in Japanese.

This problem is not restricted to numeral partitives but is also present in the *either/or* construction, as we can see from the sentences in (71), which were introduced in the discussion of the position of the numeral classifier.

(71) a. Taro-wa koohii ka kootya(,) dottika (hito-tu)-o nonda.　　(NP + Q + Case)

        T-Top　　coffee or tea-NO　either　1-Cl-Acc　drank

   b. Taro-wa koohii ka kootya-o dottika (hito-tu) nonda.　　(NP + Case + Q)

The problematic word orders thus seem to be an issue of partitives in general. This point is left for future research.

Before closing this section, let me introduce another word order of the *either/or* construction that seems to have a structure different from numeral partitives. The word order "DisjP + *dottika* + case + numeral" in (92a) has been put aside so far.

(92) a. Taro-wa [koohii ka kootya-no dottika]-o **ni-hai** nonda.

        T-Top　　coffee or tea-NO　either-Acc 2-Cl　drank

        'Taro drank two cups of coffee or two cups of tea.'

   b. Taro-wa [koohii ka kootya-no dottika-no nomimono]-o **ni-hai** nonda.

        T-Top　　coffee or tea-NO　either-NO drink-Acc　2-Cl　drank

        'Taro drank two cups of either of the drinks coffee or tea.'

Observe that the numeral can be *two*. Since *dottika* 'either' picks up one of the two options, the numeral clearly does not express the number of elements that *dottika* 'either' picks up,

but the number of cups of coffee or tea, whichever *dottika* 'either' picks up. It is assumed that in this sentence, the numeral modifies the whole structure DisjP + *dottika* 'either,' that is, it has a structure similar to the sentence in (92b), and that the sentence has a different structure from the one proposed in this chapter.

The first idea that comes to mind is that, under this reading, the numeral modifies the DisjP + *dottika* 'either' in the same way as quantifiers and numerals usually modify nouns. However, the possible word orders seem to differ not only from partitives but also from Floating Quantifiers. From (92a), the numeral can go in front of the DisjP + *dottika* 'either,' as in (93a), but inserting *-no* makes the sentence less acceptable, and the word order in (93b) has only the infelicitous "picking out two from two options" reading for me. The structure of (92a) is left open for now.

(93) a. Taro-wa **ni-hai(-?*no)** [koohii ka kootya-no dottika]-o nonda.

 b.?* Taro-wa [koohii ka kootya-no dottika] **ni-hai**-o nonda.

5.2. Variation of Dottika *'Either'*

 In the examples given so far, *dottika* 'either' has been used in the *either/or* construction. Depending on the nature and the number of disjuncts, *dottika* 'either' can be replaced by *doreka* and *dareka*. This section examines the variations of the *either/or* construction.

 Dottika 'either' can be used when the disjuncts are either human or nonhuman, and it is used with two disjuncts. As we have seen earlier, *dottika* 'either' optionally accompanies a numeral classifier *hito-tu*, as in (94a). It is also possible to elide *dottika* 'either' and have only the numeral classifier, as shown in (94b).

(94) a. Taro-wa koohii ka kootya-no dottika (hito-tu)-o nonda.

   T-Top coffee or tea-Gen either 1-Cl-Acc drank

   'Taro drank either (one) of coffee or tea.'

b. Taro-wa koohii ka kootya-no hito-tu-o   nonda.

T-Top   coffee or tea-Gen   1-Cl-Acc drank

'Taro drank one of coffee or tea.'

In sentences with human disjuncts, *dottika* 'either' optionally accompanies a numeral classifier *hito-ri*, as in (95a). The classifier *-ri* used for humans is chosen in this sentence. It is also possible to elide *dottika* 'either' and only have the numeral classifier, as in (95b).

(95) a. Dansi gakusei ka jyosi   gakusei-no dottika (hito-ri)-ga siken-ni otita.

male   student or female student-Gen either   1-Cl-Nom   exam-to   failed

'Either (one) of the male student(s) or the female student(s) failed the exam.'

b. Dansi gakusei ka jyosi   gakusei-no hito-ri-ga siken-ni   otita.

male   student or female student-Gen 1-Cl-Nom exam-to   failed

'One of the male student(s) or the female student(s) failed the exam.'

Since Japanese does not have an overt plural marker, the sentences are ambiguous: (95a) is acceptable in a situation in which there are two specific students (one male and one female, one of whom is failing the exam) and in a situation in which there are two specific groups of male students and female students (with one student of either group failing the exam). (95b) is also ambiguous between the two readings.

Doreka is used with nonhuman disjuncts and selects from more than two options. A numeral classifier can specify the number of options. For instance, (96a) is an example of selecting one of three options, and (96b) is an example of selecting two of three options.

(96) a. Taro-wa koohii ka kootya ka jyuusu-no doreka (hito-tu)-o nonda.

T-Top   coffee or tea   or juice-Gen any   1-Cl-Acc   drank

'Taro drank any (one) of coffee, tea, or juice.'

b. Taro-wa koohii ka kootya ka jyuusu-no doreka futa-tu-o nonda.

T-Top   coffee or tea   or juice-Gen any   2-Cl-Acc drank

'Taro drank any two of coffee, tea, or juice.'

As was the case with *dottika* 'either,' only one position is available for the numeral classifier, namely, directly following *doreka*, at least in the reading where the numeral expresses the number of the elements that *doreka* picks up. This is illustrated in (97).

(97)   Taro-wa **(*futa-tu)** koohii ka kootya ka juusu-no (uti-no) **(*futa-tu)**

T-Top   2-Cl   coffee or tea   or juice-NO out-of 2-Cl

doreka futa-tu-o nonda.

any   2-Cl-Acc drank

'Taro drank (any) two out of coffee, tea, or juice.'

Dottika 'either' may be replaced with the indeterminate *dareka* 'someone' when the disjuncts are human and there are more than two options. As shown in the table repeated in (65), *dare* itself is used as a *wh*-phrase meaning *who*, but when combined with a universal particle *mo* or an existential particle *ka*, it can also mean *everyone* or *someone*.

(65)   Paradigm of indeterminate phrases (Shimoyama (2006: 143))

Interrogative	Universal	Existential
dare…ka 'who'	*dare-mo* 'everyone'	*dare-ka* 'someone'
nani…ka 'what'	(*nani-mo*)	*nani-ka* 'something'

Dottika 'either' in (95a) can be replaced by *dareka* 'someone' under the second reading, since in the second reading, there are more than two people in the context to choose from. Furthermore, sentence (98a) with three options has the same ambiguity as (95a), as shown

in the translation.

(98) a. Itinensei ka ninensei ka sannensei-no (uti-no) dareka (hito-ri)-ga

freshman or sophomore or junior-Gen out-of someone 1-Cl-Nom

siken-ni otita.

exam-to failed

'Someone of the freshman(men), sophomore(s), or junior(s) failed the exam.'

b. ?*Itinensei ka ninensei ka sannensei-no (uti-no) dareka futa-ri-ga

freshman or sophomore or junior-Gen out-of someone 2-Cl-Nom

siken-ni otita.

exam-to failed

'Some two of the freshman(men), sophomore(s), or junior(s) failed the exam.'

Notice, however, that *dareka* 'someone' differs from *doreka* in that it cannot select two options. (98b), corresponding to (96b), is unacceptable. This fact that *dareka* 'someone' cannot occur with the numeral *two* might come from its property of being grammatically a singular noun and having a [+sg] feature (cf. Hiraiwa (2019)).

When *dareka* 'someone' is used, there is an interesting contrast between sentences with and without a DisjP as the whole element. In the former, the sentence is unacceptable if a noun is used in the part element that is not a common property of the disjuncts. Consider (99a,b), in which Taro and Jiro are male, Hanako is female, and all three are students. As in (99a), using the noun *gakusei* 'student' in the part element with *dareka hito-ri* 'someone' is unproblematic since *gakusei* 'student' is not specified in terms of gender. Using *dansi gakusei* 'male student' greatly drops the acceptability of the sentence, as in (99b).

97

(99) a. Taro ka Hanako ka Jiro-no (uti-no) dareka hito-ri-no **gakusei**-ga

     T   or   H   or   J-Gen   out-of   someone   1-Cl-NO   student-Nom

     siken-ni otita.

     exam-to failed

     'Some one student out of Taro, Hanako, or Jiro failed the exam.'

  b.?*Taro ka Hanako ka Jiro-no (uti-no) dareka hito-ri-no **dansi gakusei**-ga

     T   or   H   or   J-Gen   out-of   someone   1-Cl-NO   male   student-Nom

     siken-ni otita.

     exam-to failed

     'Some one male student out of Taro, Hanako, or Jiro failed the exam.'

  c. Taro ka Hanako ka Jiro-no gakusei san-nin-no

     T   or   H   or   J-Gen   student   3-Cl-Gen

The unacceptability of (99b) seems to arise from the presence of Hanako as a disjunct. According to the present analysis, DP$_{\text{Whole}}$ in (99a,b) has the fully realized form in (99c), with a numeral classifier and an NP. The common property of Taro, Hanako, and Jiro is being a student, so *gakusei* 'student' is used in DP$_{\text{Whole}}$. Thus, (99b) is degraded because of the mismatch of NP in DP$_{\text{Whole}}$ and DP$_{\text{Part}}$. It seems that when the whole element is a DisjP, NP in DP$_{\text{Whole}}$ and NP in DP$_{\text{Part}}$ have to completely match to establish a part-whole relation.[17]

---

[17] A similar phenomenon is observed by Simons (1996) for anaphora between a disjunct and a pronoun in the following sentence. In a sentence with indefinite disjuncts (i), the pronoun in the following sentence can refer to DisjP in a particular way.
(i) Either a soprano or an alto will sing. She will stand on that platform.

                                      (Simons (1996: 250))
In (i), a soprano and an alto are both sung by a woman, so *she* can be used, but the pronoun does not refer to either *a soprano* or *an alto*. Rather, it refers to the DisjP as a whole and the sentence only has a reading "Whoever sings, she will stand…"
   Simons (1996) also reports that in (ii), where a soprano is sung by a woman and a bass is sung by a man, referring to the bass with *he* in the second sentence is impossible. She claims that the ambiguity of the referent is not the reason why the pronoun cannot refer to either of the disjuncts.

Note that this "complete-match" requirement does not exist in numeral partitives and sentences in which the whole element is an NP. In (100a,b), not all of the students in the class next to us have to be male students, and not all of the books on the bookshelf have to be magazines.

(100) a. Tonari-no kurasu-no (uti-no) dareka hito-ri-no dansi gakusei-ga

next-NO class-Gen out-of someone 1-Cl-NO male student-Nom

siken-ni otita.

exam-to failed

'Some one male student out of the class next to us failed the exam.'

b. Taro-ga [[hondana-ni atta ~~hon~~ go-satu-no]$_{DP}$ (uti-no) zassi san-satu-o]$_{DP}$

T-Nom bookshelf-on were book 5-Cl-NO out.of magazine 3-Cl-Acc

yonda.

read

'Taro read three magazines out of the five reading materials on the bookshelf.'

Here, the requirement on the relationship between the nouns in DP$_{Whole}$ and DP$_{Part}$ seems to be set inclusion, rather than a complete match. This is a difference between the *either/or* construction and numeral partitives and between constructions with and without DisjP as the whole element.

This section has illustrated that *dottika, doreka*, and *dareka* show slightly different

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(ii) Either a soprano or a bass will sing. #He will stand on that platform.

(Simons (1996: 250))

She further observes a reverse pattern, namely, the pronoun having the "Whoever sings,…" reading when it unambiguously refers to one of the disjuncts as in (iiia), while the sentence is infelicitous when the referent is ambiguous as in (iiib). The first pattern only arises with a slight stress on the pronoun.

(iii) a. Either Jane or George will sing. HE will also play the piano.

b. Either Jane or Maud will sing. #She will stand on that platform.

(Simons (1996: 250))

behaviors. *Dottika* 'either' can refer to human or nonhuman disjuncts, but it has to select one of two options. *Doreka* can only refer to nonhuman disjuncts, and it can select two or more of three or more options. *Dareka* 'someone' can only refer to human disjuncts, and it can select one of three or more options.

The observation made in this section leads us to the idea that the items are decomposable, for example *do-tti-ka*, *do-re-ka*, and *da-re-ka*, and that each particle has its own syntactic and semantic role that together derive the differences between the items. If this is on the right track, the structure proposed in (62b) and (63b) must be even more complicated, with a more complex structure within *dotti* 'either' and other items modifying the numeral. Detailed investigation of the inner structure of indeterminate phrases (and related demonstratives) is left for future research. (However, see Miyama (2012) for preliminary remarks on the morphology of *dottika* 'either' and *dotira*, a polite form of *dottika*.)

5.3. *Environments in Which Disjunction and Conjunction Intersect*

Recall that we assume the syntactic structure in (75) for DisjPs in Japanese. If we further assume a structure similar to the one argued for by Mitrović and Sauerland (2016) in (76) for conjunction, we do not expect a syntactic difference between the two particles *to* 'and' and *ka* 'or.'

(75) The structure of a DisjP in Japanese

(76)   Structure of *Bill mo Mary mo* 'Bill and Mary'

```
                    JP
            _____|_____
          μP                 |
        __|__           _____|_____
      XP    μ⁰        J⁰          μP
       |     |         |        __|__
       |     |     (silent)   YP    μ⁰
     Bill   mo                 |     |
                             Mary   mo
```
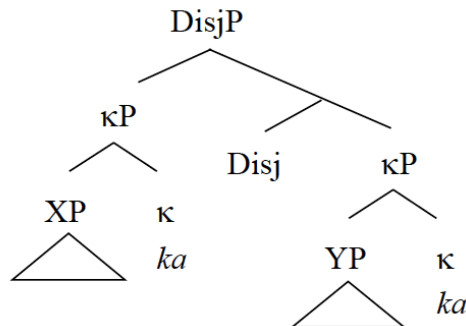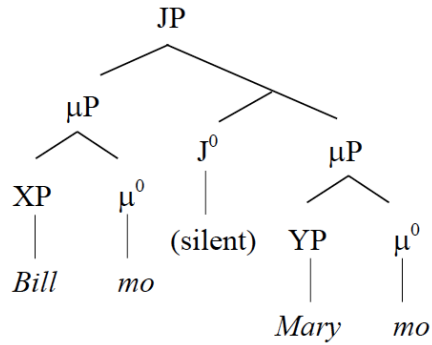
(Mitrović and Sauerland (2016:477))

A sentence with a conjunction particle *to* 'and' (101a) and a sentence with a disjunction particle *ka* 'or' (101b) are semantically different since in semantic research a conjunction particle is generally considered to denote a set intersection while a disjunction particle is considered to denote a set union (see the review in Chapter 1 regarding research on the semantics of coordination).

(101) a. Taro-ga koohii to   kootya-o nonda.
         T-Nom   coffee and   tea-Acc   drank
         'Taro drank coffee and tea.'
      b. Taro-ga koohii ka   kootya-o nonda.
         T-Nom   coffee or   tea-Acc   drank
         'Taro drank coffee or tea.'

A syntactic difference between *to* 'and' and *ka* 'or' is the syntactic category of the coordinands. As in (102), a disjunction structure using *ka* 'or' can have clauses, VPs, or PPs as disjuncts in addition to NPs.

(102) a. [_{DisjP} John-ga   hasitta ka Mary-ga koronda   ka] da.

           J-Nom   ran   or M-Nom fell.down or Cop

       'John ran or Mary fell down.'   (Kishimoto (2013: 16))

   b. [_{DisjP} John-ga   kooen-e iku ka Mary-ga gakko-e iku ka] da.

           J-Nom   park-to go or M-Nom school-to go   or   Cop

       'John goes to the park or Mary goes to school.'   (Kishimoto (2013: 20))

   c. [_{DisjP} John-ga   hasir-i   ka Mary-ga korob-i   ka] sita.

           J-Nom   run-Con or   M-Nom fall.down-Con or   did

       'John ran or Mary fell down.'   (Kishimoto (2013: 16))

   d. Densya-ga [_{DisjP} Tokyo eki   kara ka Shinagawa eki   kara (ka)]

       train-Nom   T   station from or S   station from or

       syuppatusuru.

       will.depart

       'The train will depart from Tokyo Station or Shinagawa Station.'

In contrast, *to* 'and' can only have NPs, PPs, and nominalized clauses as conjuncts, as in
(103a,b). When VPs are conjuncts, the sentences need particles such as *-tari* and *-te*, as in
(103c,d).

(103) a. Densya-ga [Tokyo eki   kara to] [Shinagawa eki   kara (to)]

       train-Nom T   station from and S   station from and

       syuppatusuru.

       will.depart

       'The train will depart from Tokyo Station and Shinagawa Station.'

   b. [John-ga hasitta-no to]   [Mary-ga koronda-no   (to)]-o   mita.

       J-Nom   ran-Nmnl and M-Nom   fell.down-Nmnl and-Acc saw

       'I saw John running and Mary falling down.'

c. [John-ga hasi-ttari] [Mary-ga koron-dari]   sita.

J-Nom   run-and   M-Nom   fall.down-and did

'(Things like) John running and Mary falling down happened.'

d. [John-ga hasi-tte] [Mary-ga   koron]-da.

J-Nom   run-and M-Nom   fall.down-Past

'John ran and Mary fell down.'

To 'and' can appear in some of the same positions as *ka* 'or,' and, as anticipated, changing the particle changes the interpretation of the sentence. For example, Conjunction Phrases (ConjPs) with *to* 'and' can accompany a numeral classifier and a noun that describes the property of the conjuncts, as in (104a,b). The examples resemble DP$_{Whole}$ in the *either /or* construction in (105), with the DisjP, numeral classifier, and the noun that denotes the property of the disjuncts.

(104) a. Taro-wa koohii to   kootya-no futa-tu-no nominono-o nonda.

T-Top   coffee and   tea-NO   2-Cl-NO drink-Acc   drank

'Taro drank two kinds of drinks, coffee and tea.'

b. Taro to   Hanako-no futa-ri-ga kita.

T   and H-NO   2-Cl-Nom came

'Two people, namely Taro and Hanako, came.'

(105)   Taro-wa [[[koohii ka kootya-no (futa-tu-no nomimono-no)]$_{DP}$ (uti-no)]$_{FP}$

T-Top   coffee or   tea-NO   2-Cl-NO   drink-Gen   out-of

[dottika (hito-tu-no nomimono)-o]]$_{DP}$ nonda.

either   1-Cl-NO   drink-Acc   drank

'Taro drank either (one drink) out of (two drinks) coffee or tea.'

In fact, there are interesting environments in which *to* 'and' can completely substitute

for *ka* 'or.' Miyama (2013) and Miyama (2015a) have introduced data like (106) and observed that in the *either/or* construction and AltQs, *to* 'and' and *ka* 'or' are interchangeable only when *dottika* 'either' or *dotti* 'which' is present.

(106) a. Taro-wa [koohii {to/?ka} kootya {to/?ka}]-no **dottika**-o nonda.

   T-Top   coffee   and/or   tea   and/or-NO   either-Acc   drank

   'Taro drank either coffee or tea.'

   b. Taro-wa [koohii {to/?ka} kootya {to/?ka}]-no **dotti**-o

   T-Top   coffee   and/or   tea   and/or-NO   which-Acc

   nomi-masi-ta   ka?

   drink-Pol-past   Q

   'Which did Taro drink: coffee or tea?'

It seems that in (106), *to* 'and' and *ka* 'or' are interchangeable because they lose their conjunction/disjunction meaning. When we do not use *dottika/dotti* 'either/which' as in (107), naturally, *to* means 'and' and *ka* means 'or,' and in (107b), the AltQ does not retain its meaning and becomes a Yes/No Question (YNQ). (We will examine the AltQ and YNQ data in detail in Chapter 3.)

(107) a. Taro-wa [koohii {to/ka} kootya {to/ka}]-o nonda.

   T-Top   coffee   and/or   tea   and/or-Acc   drank

   'Taro drank {coffee and tea/coffee or tea}.'

   b. Taro-wa [koohii {to/ka} kootya {to/ka}]-o nomi-masi-ta ka?

   T-Top   coffee   and/or   tea   and/or-Acc   drink-Pol-past   Q

   'Did Taro drink {coffee and tea/coffee or tea}?'

The data set indicates that *dottika* 'either' and *dotti* 'which' have some semantic role, and

because of their work, the semantic difference between *to* 'and' and *ka* 'or' is somehow nullified. In Chapter 3, the semantics of the *either/or* and AltQ constructions is investigated. The analysis proposed in Chapter 3 conforms to the data set discussed here.

6.   Summary of the Chapter

This chapter has investigated the syntactic structure of the *either/or* and AltQ constructions in relation to that of numeral partitives. The claims made in this chapter are summarized as follows:

(108) a. The *either/or* and AltQ constructions are a type of partitive.

b. The DisjP and *dottika/dotti* 'either/which' in the constructions together project a DP projection, even when the disjuncts are not DPs.

c. In numeral partitives and the *either/or* and AltQ constructions, the part element and the whole element each projects a fully-projected DP, and there is an FP layer that marks the part-whole relation between the two DPs.

Important observations made in this chapter include the fact that *dottika* 'either' and *dotti* 'which' in the *either/or* and AltQ constructions can be replaced with items such as *doreka, dore, dareka*, and *dare*, which can pick up more than one item from three or more options. This fact leads us to conclude that the *either/or* and AltQ constructions, whose charactersics is selecting one of two options, are not special constructions with a special structure, but fall into the category of a more general partitive construction, which selects some element(s) from a set of options.

The next chapter focuses on the semantics of the constructions and examine how the interpretation of the sentences can be derived based on the syntactic structure proposed in this chapter.

Appendix: The Position of Relative Clauses

Up to this point, a relative clause has been placed within NP in the numeral partitive examples, for example, in (27b) repeated below. The relative clause has been placed in this position to avoid a potential problem in semantic computation.

(27) a.   Taro-wa [[[#P go t_NP satu]-no   hondana-ni   atta   hon t_#P -no]_DP (uti-no)

      T-Top   5-Cl-Gen   bookshelf-on were book-Gen   out-of

      san-satu-no hon-o]_DP   yonda.

      3-Cl-NO   book-Acc read

      'Taro read three books of the five books on the bookshelf.'

   b.   Structure of (27a)
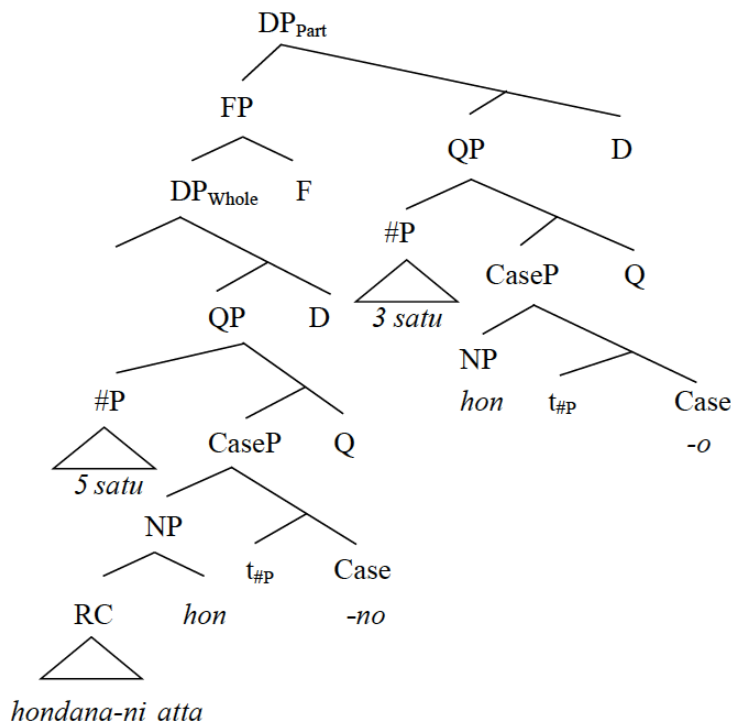
In terms of semantic computation, relative clauses should combine with the head noun first and then with the numeral. In the framework of Heim and Kratzer (1998), relative clauses are computed via Predicate Abstraction, which is to abstract over the variable that is rewritten from the trace within the relative clause. As shown in (109b), a relative clause

in (109a) denotes a set of individuals on the bookshelf as a result of Predicate Abstraction in (110).

(109) a. I read [$_{DP}$ the [$_{NP}$ book [$_{RC}$ which t was on the bookshelf]]].

   b. [[RC]] = λx_e. x was on the bookshelf

   c. [[NP]] = λx_e. x is a book and x was on the bookshelf

(110) Predicate Abstraction (Heim and Kratzer (1998: 96))

   If α is a branching node whose daughters are a relative pronoun and β, then

   [[α]] = $\lambda x \in D$. [[β]]^x.

Both the head noun and the relative clause are of type $<e,t>$, and they are combined by Predicate Modification in (111). The result is given in (109c). With Predicate Modification, the denotation of the NP is an intersection of the sets that the head noun and the relative clause denote. This NP in turn becomes the argument of *the*.

(111) Predicate Modification (Heim and Kratzer (1998: 95))

   If α is a branching node and {β, γ} the set of its daughters, then, for any assignment

   a, if [[β]]^a and [[γ]]^a are both functions of type $<e,t>$, then [[α]]^a = $\lambda x \in D$.

   [[β]]^a(x) = [[γ]]^a(x) = 1.

   For Relative Clauses with numerals on the head noun, the computation should be essentially the same: The head noun and the relative clause after Predicate Abstraction combine first, resulting in an intersection of the two, and then the numeral specifies the cardinality of the set. Thus, sentence (112) should have the denotation in (113). This method of computation is directly applicable to the proposed structure, as we will see in the next chapter.

(112) I read [$_{DP}$ two [$_{NP}$ books [$_{RC}$ which *t* were on the bookshelf]]].

(113) [[(112)]] = λx$_e$. x is a book and x was on the table and |x| = 2

However, there is another possible position for the relative clause in DP$_{Whole}$. Consider the word order in (114), which minimally differs from (27a).

(114) Taro-wa [[**hondana-ni atta** [$_{\#P}$ go t$_{NP}$ satu]-no hon t$_{\#P}$ -no]$_{DP}$ (uti-no)

san-satu-no   hon-o]$_{DP}$ yonda.

In (114), the relative clause is in front of the #P, which has moved. To account for the word order, the only possible position of the relative clause is SpecDP$_{Whole}$, as in (115). How is this word order obtained?

(115) Structure of (114)
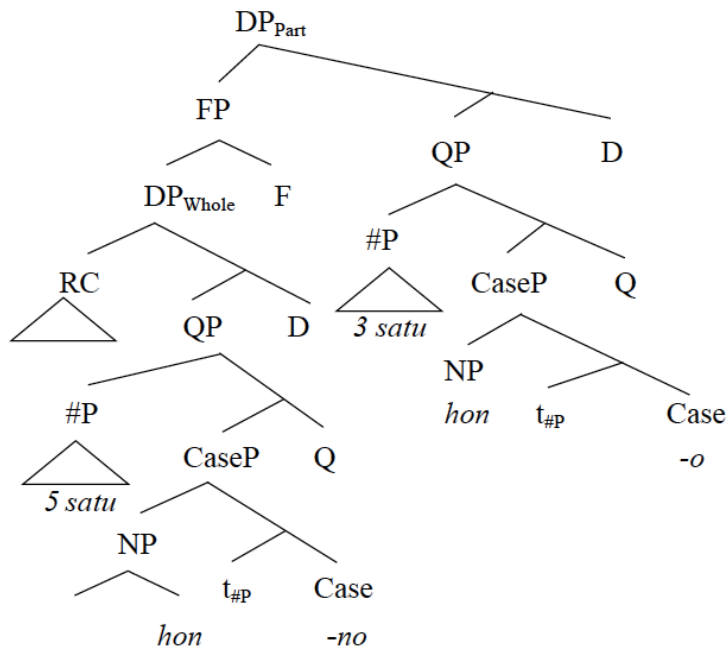
Two possibilities are offered here. The first possibility is that the relative clause has moved in the PF component. This movement may be motivated to avoid center-embedding.

As seen from the structure of DP$_{\text{Whole}}$ in (27b), in which the relative clause is within the NP and is represented with brackets in (116), the structure is an instance of center-embedding, with the numeral classifier modifying the noun over the relative clause.

(116)   [$_{\text{DPwhole}}$ [$_{\text{CaseP}}$ [$_{\text{\#P}}$ go t$_{\text{NP}}$ satu]-no [$_{\text{NP}}$ [$_{\text{RC}}$ hondana-ni   atta] hon] t$_{\text{\#P}}$ -no]

Since a center-embedding structure causes difficulty in parsing the sentence, we can posit a movement in the PF component that avoids this difficulty.

   The second possibility is the relative clause being moved in the syntax by scrambling. In this case, an optional, short-distance scrambling takes place within DP$_{\text{Whole}}$. This option also seems plausible since the movement of the relative clause does not affect the overall interpretation.

Chapter 3

The Semantics of the Japanese *Either/or* Construction and AltQs

1. Introduction

This chapter focuses on the semantics of the counterpart of the *either/or* construction in Japanese, such as the one in (1) and Alternative Questions (AltQs) shown in (2), in comparison with numeral partitives. In (1), we can use the item *dottika*, which means *either*, with a Disjunction Phrase (DisjP), and the sentence has roughly the same surface form as the English *either/or* construction in the translation. (2) is an AltQ whose surface form resembles the English *wh* question with *which* in the translation.

(1)   Taro-ga   koohii ka kootya-no   dottika-o   nonda.

T-Nom   coffee   or tea-NO   either-Acc   drank

'Taro drank either coffee or tea.'

(2)   Taro-ga koohii ka kootya-no dotti-o   nomi-masi-ta ka?   **(AltQ/*YNQ)**

T-Nom   coffee or   tea-NO   which-Acc drink-Pol-past Q

'Which did Taro drink: coffee or tea?'

As introduced in Chapter 1, (2) with *dotti* 'which' is unambiguously an AltQ, while when we use *dottika* 'either' or neither of the two in an interrogative sentence, the sentence is unambiguously a Yes/No Question (YNQ) as in (3).

(3)   Taro-ga koohii ka kootya(-no dottika)-o nomi-masi-ta ka?   **(*AltQ/YNQ)**

T-Nom   coffee or   tea-NO   either-Acc drink-Pol-past Q

'Did Taro drink (either) coffee or tea?'

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* A previous version of this chapter was presented at the 11th Workshop on Altaic Formal Linguistics held in York in 2015.

The discussion in this chapter is based on the syntactic structure proposed in Chapter 2 for the two constructions in (4a,b).

(4) a. Structure of (1)

```
                          DP_Part
                         /        \
                    FP              \
                   /  \              QP        D
             DP_Whole  F           /  \       /  \
             /    \               #P        CaseP   Q
        DisjP      \             /  \       /   \
        /  \        QP  D  dottika        NP      \
  koohii ka kootya  /  \          1   /  \   t_NP  # nomimono  t_#P  Case
                   /    \                                tu           -o
              CaseP      Q
             /   \
          NP      \
     nomimono #P    Case
            /  \      -no
           2  t_NP  tu
```

b. Structure of (2)

```
                          DP_Part
                         /        \
                    FP              \
                   /  \              QP        D
             DP_Whole  F           /  \       /  \
             /    \               #P        CaseP   Q
        DisjP      \             /  \       /   \
        /  \        QP  D  dotti          NP      \
  koohii ka kootya  /  \              nomimono  t_#P  Case
                   /    \                              -o
              CaseP      Q
             /   \
          NP      \
     nomimono #P    Case
            /  \      -no
           2  t_NP  tu
```
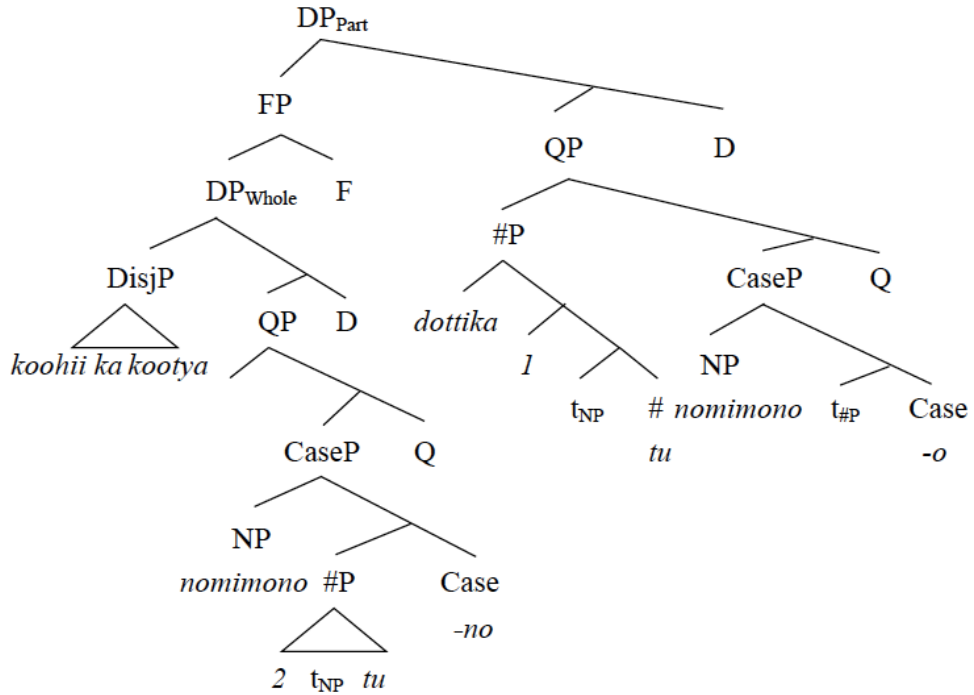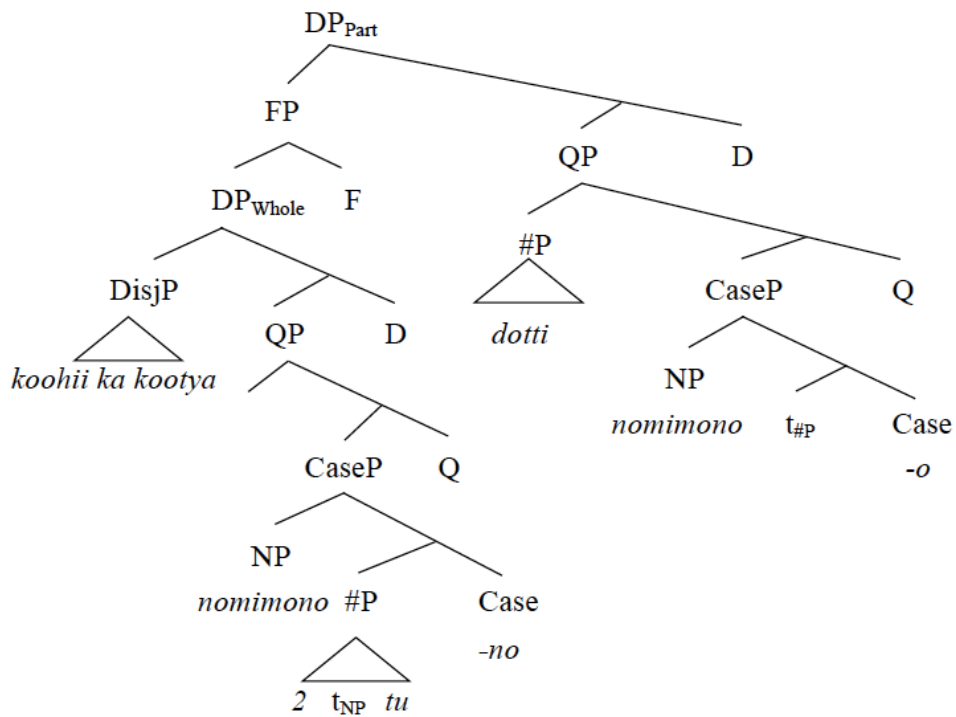
Recall that under the proposal of Chapter 2, (1) and (2) have (5a) and (5b), respectively, as their underlying forms. There are two fully projected DPs in both sentences.

(5) a. Taro-ga [[[koohii ka kootya-no nomimono futa-tu-no]$_{DP}$ (uti-no)]$_{FP}$

     T-Nom   coffee   or   tea-NO   drink   two-Cl-Gen   out-of

     [dottika hito-tu-no nomimono-o]]$_{DP}$ nonda.

     either   1-Cl-NO   drink-Acc   drank

     'Taro drank either one of two drinks: coffee or tea.'

   b. Taro-ga [[[koohii ka kootya-no nomimono futa-tu-no]$_{DP}$ (uti-no)]$_{FP}$

     T-Nom   coffee   or   tea-NO   drink   two-Cl-Gen   out-of

     [dotti-no   nomimono-o]]$_{DP}$ nomi-masi-ta ka?

     which-NO   drink-Acc   drink-Pol-past Q

     'Which drink did Taro drink: coffee or tea?'

In the *either/or* construction, the two DPs can have a numeral, classifier, and a noun phrase. In AltQs, *dotti* 'which' cannot be accompanied by a numeral and classifier. This property is not derived by composition, since *dottika* 'either' does not inherit it, and it was claimed to be a property characteristic of *wh*-phrases. *Uti-no* 'out of,' an optional item that emphasizes the part-whole relation, occupies a position in the FP.

    The goal of this chapter is to provide a compositional semantics of numeral partitives and the *either/or* and AltQ constructions, building on the syntactic structure above. The present proposal employs a choice function analysis, in which DisjP denotes a set of elements connected by *ka* 'or,' and *dottika* 'either' introduces a choice function variable that is bound by an existential operator higher up in the structure. A compositional semantics of *dottika* 'either,' which is generally claimed to consist of an indeterminate expression *dotti* and an existential particle *ka*, is also discussed.

    The semantic proposal for numeral partitives is presented first in Section 2. The

semantic differences between numeral partitives and the *either/or* and AltQ constructions are also described. In Section 3, previous research that proposes a choice function analysis of *ka*, which functions as a question particle or an existential particle, is introduced. If we combine the analysis of previous studies with a choice function analysis of *dotti*, we can explain both the *either/or* construction and AltQ/YNQ data. Section 4 concludes the chapter.

2.   The Semantics of Numeral Partitives

2.1.   The Semantics of Numeral Partitives

This section focuses on how numeral partitives, such as the one in (6), are computed semantically. The semantic computation of the construction is simpler than those of the *either/or* construction and AltQs since it lacks the special items *dottika* 'either' or *dotti* 'which.'

(6)   Taro-wa   hondana-ni   atta   hon-no   uti-no   san-satu-o   yonda.

         T-Top   bookshelf-on   were   book-Gen   out-of   3-Cl-Acc   read

         'Taro read three of the books on the bookshelf.'

Discussion in Chapter 2 showed that (6) has (7a) as its underlying form, in which both the part element and the whole element project a DP with a numeral, a classifier, and an NP. It was also proposed that (7a) has the structure in (7b) and that *uti-no* 'out of' occupies the F head position and marks the part-whole relation.

(7) a.   Taro-wa [[hondana-ni   atta   hon   go-satu-no]$_{DP}$ uti-no hon   san-satu-o]$_{DP}$yonda.

         T-Top   bookshelf-on   were book 5-Cl-Gen   out-of book 3-Cl-Acc   read

         'Taro read three out of the five books on the bookshelf.'

b. Structure of (7a)

DP_Part

FP QP D_Part

DP_Whole F

QP D_Whole CaseP Q

NP #P Case

CaseP Q hon -o

NP #P Case 3

RC hon 5 -no t_NP #

satu

hondana-ni atta t_NP satu
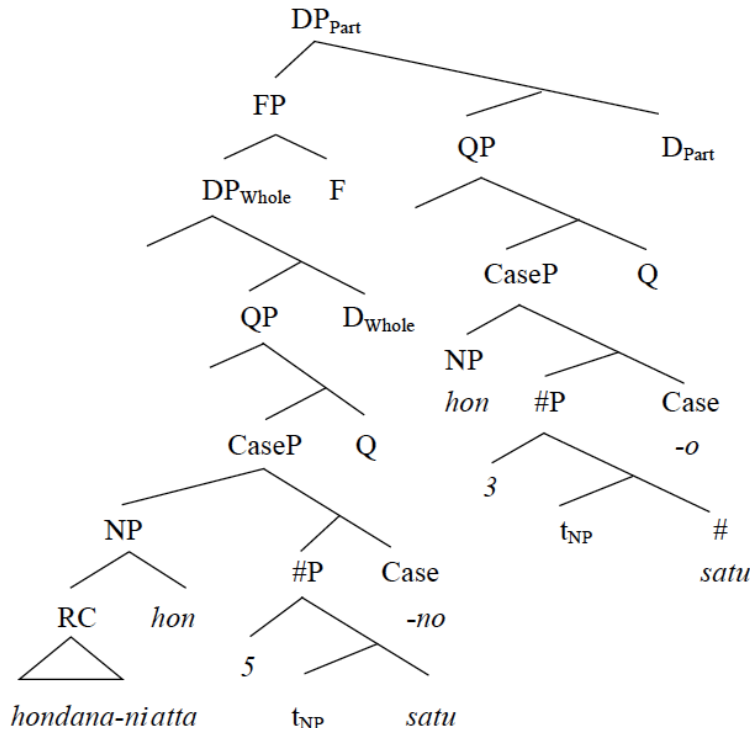
The denotation in (8) is proposed for the F head which is realized as *uti-no* 'out of.' F head denotes an improper partitivity relation between its first argument and its second argument. The denotation is the same as that in Ionin et al. (2006), who studied English partitives.[1,]

(8) $[\![\, F \,]\!] = \lambda x.\ \lambda y.\ [y \leq x]$

---

[1] Researchers differ in the analysis of *of*. For example, Barker (1998) proposes the proper partitivity denotation in (i), whereas Ionin et al. (2006) propose the improper partitivity denotation in (ii).

(i) $[\![\, of \,]\!] = \lambda x.\ \lambda P.\ \lambda y.\ [P(y) \wedge y < x]$ (Barker (1998: 698))
(ii) $[\![\, of \,]\!] = \lambda x.\ \lambda y.\ [y \leq x]$ (Ionin et al. (2006: 359))

Improper partitivity is adopted for *uti-no* 'out of' since it does not necessarily force proper partitivity in all examples, as the instance in (iii) illustrates.

(iii) Taro-wa kuroi hondana-ni   atta hon go-satu-no uti-no san-satu-o, siroi
      T-Top black bookshelf-on were book 5-Cl-Gen   out-of 3-Cl-Acc   white
      hondana-ni   atta hon roku-satu-no uti-no roku-satu(-tomo)-o yonda.
      bookshelf-on were book 6-Cl-Gen   out-of 6-Cl-all-Acc   read
      'Taro read three of the five books on the black bookshelf, and all six books on the white bookshelf.'

To derive the denotation of DP$_{Whole}$, we first need to combine NP and #P and obtain the denotation of CaseP. The denotation of CaseP equals that of QP, as seen from the structure in (7b). The NP consists of a relative clause and a noun. The relative clause has the semantics in (9a), based on the framework of Heim and Kratzer (1998), who treat relative clauses as abstracting over the variable that is rewritten from the trace inside them. The denotation of NP, which is the result of combining the relative clause and the noun by Predicate Modification in (10), is shown in (9b).

(9) a. [[RC]] = λx_e. x was on the bookshelf

b. [[NP]] = λx_e. x is a book and x was on the bookshelf

(10) Predicate Modification (Heim and Kratzer (1998: 95))

If α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any assignment *a*, if [[β]]^a and [[γ]]^a are both functions of type <e,t>, then [[α]]^a = $\lambda x \in D$. [[β]]^a(x) = [[γ]]^a(x) = 1.

For the semantics of Japanese NPs, Link's (1983) theory of plurality is presumed, in which the semantics of singular count nouns, plural count nouns, and mass nouns are depicted using a lattice. Both singular and plural count nouns denote a set of individuals. Singular count nouns denote a set of atomic individuals, while plural count nouns denote a set of individuals, including plural individuals formed by the sum operation $\oplus$.

Next, we move on to the semantics of #P. Following the theory of numerals by Partee (1986), who analyzes them as predicates of type *<e,t>*, and assuming that classifiers do not contribute to the semantics, the numeral classifier in (7a), namely, *go-satu* '5-Cl,' has

the semantics in (11).[2,3]

(11) $[[\#P]] = \lambda x_e. \; |x| = 5$

NP in (9b) and #P in (11) are combined by Predicate Modification, and the denotation of the QP is as in (12). In this denotation, x is a plural individual whose cardinality is five.

(12) $[[QP]] = \lambda x_e.$ x is a plurality of books, x was on the bookshelf and $|x| = 5$

According to the semantics in (12), the QP interpretation is not necessarily definite (i.e., they can be any five books on the bookshelf). However, DP$_{Whole}$ in (7a) is a definite expression with the translation "the five books on the bookshelf." This fact conforms to the well-known constraint on English partitives whereby the NP that corresponds to the "whole" tends to be definite: Thus, it has a definite article, demonstrative, or a possessor (cf. Jackendoff (1977); for subsequent research on the partitive constraint see Barwise and Cooper (1981), Ladusaw (1982), and de Hoop (1997), among others). It also matches Inoue's (1978) observation that in Japanese partitives, a relative clause tends to be present inside the whole element in order to make it a definite expression. Thus, the D$_{Whole}$ head is assumed to have the semantic role of turning QP into a definite expression. The denotation assumed here uses the iota operator, which reads "the unique x such that" as in (13).

---

[2] There are other lines of research on the semantics of numerals. For example, Ionin and Matushansky (2018) claim that numerals are modifiers of type $<<e,t>, \; <e,t>>$, considering the data of complex cardinals. On the other hand, Geurts (2006), among others, defends an analysis in which numerals are quantificational determiners of type $<<<e,t>, \; <e,t>>, \; t>$, considering the special property of numerals that they can indicate meanings "more than …" and "exactly…" As for classifiers, some researchers assign them a semantic role independent from that of numerals. For example, Chierchia (1998) proposes that classifiers turn mass nouns into sets of atoms and make them countable, and Kobuchi-Philip (2007) puts forward an analysis of Japanese classifiers in which they are predicates that denote a set of atomic individuals.

[3] In this thesis, the cardinality operator is assumed to apply to both sets and plurals. In (11) and many examples in this chapter, it takes a plurality as its argument.

(13) $[\![D_{Whole}]\!] = \lambda P.\ \iota x_e.\ P(x)$

(13) is very similar to the Fregean semantics of *the* in (14), which also makes use of the iota operator and turns an argument of type *<e,t>* into a unique individual. This fact is natural given that both the D_{Whole} head and *the* are definite determiners. The only difference between the two is the presupposition in (14) that there is exactly one *x* such that satisfies *P*.[4]

(14) $[\![the]\!] = \lambda P.\ \iota x.\ P(x):\ \exists x \forall y[P(y) \leftrightarrow x = y]$ (cf. Heim (2011: 998))

Combining QP and the D_{Whole} head in (12) and (13), the result in (15) is the semantics of DP_{Whole}.

(15) $[\![DP_{Whole}]\!] = \iota x_e.\ x$ is a plurality of books, x was on the bookshelf and $|x| = 5$

The F head in (8) takes (15) as its first argument, and the denotation of FP is as in (16).

(16) $[\![FP]\!] = \lambda y.\ y \leq [\iota x_e.\ x$ is a plurality of books, x was on the bookshelf and $|x| = 5]$

The denotation of DP_{Part} is derived in much the same way. Since the part element does not have any constraint regarding definiteness, it is assumed that the part element is indefinite and that the D_{Part} head is an identity function. The semantics of all other elements being equal to that in DP_{Whole}, the semantics of QP in (17) equals that of D_{Part}', which is the result of combining the interpretations of QP and D_{Part}.

---

[4] In the semantic formulas hereafter, the presupposition is placed after the assertion and separated by a colon.

(17) $[[QP]] = \lambda x_e.$ x is a plurality of books and $|x| = 3$

FP in (16) and QP in (17) combine by Predicate Modification, and the result is as in (18).

(18) $[[DP_{Part}]] = \lambda z_e.$ z is a plurality of books and $|z| = 3$, and $z \leq [\iota x_e.$ x is a plurality

of books, x was on the bookshelf and $|x| = 5]$

This semantics corresponds to the intended partitive reading under which the part element, which is in an improper partitivity relation with the whole element, functions as the argument of the verb. Specifically, it denotes a plural individual that is a plurality of three books and is an improper subpart of a unique plural individual that is a plurality of five books.

2.2.   Differences in the Semantics between Numeral Partitives and the Other Two Constructions

The semantics introduced in the previous section is very simple: Two DPs are connected by an F head, which introduces the improper partitivity meaning. The *either/or* construction and AltQs, however, do not have such simple semantics because the constructions have the special items *dottika* 'either' and *dotti* 'which,' and they also contain a DisjP. What specifically is different, then?

The D$_{Whole}$ head is one item that requires a denotation different from that in numeral partitives. This is because, as is obvious when we compare the structures in (4a,b) and (7b), there is a DisjP in the SpecDP$_{Whole}$ position in the *either/or* and AltQ constructions, while there is no overt item in this position in numeral partitives. As briefly discussed in the Appendix to Chapter 2, the relative clause in the whole element in numeral partitives is assumed to reside in a position adjacent to the noun head as in (7) and (19a) but can

optionally move to the SpecDP$_{Whole}$ position (as a PF movement or scrambling) as in (19b).

(19) a.   Taro-wa [[[$_{#P}$ go t$_{NP}$ satu]-no hondana-ni   atta   hon t$_{#P}$ -no]$_{DP}$ (uti-no)

      T-Top   5-Cl-NO   bookshelf-on were book -Gen   out-of

      san-satu-no hon-o]$_{DP}$ yonda.

      3-Cl-NO   book-Acc read

      'Taro read three out of the five books on the bookshelf.'

   b.   Taro-wa [[**hondana-ni atta** [$_{#P}$ go t$_{NP}$ satu]-no   hon t$_{#P}$ -no]$_{DP}$ (uti-no)

      san-satu-no hon-o]$_{DP}$ yonda.

DisjP in the *either/or* and AltQ constructions, in contrast, cannot be in a position other than the left edge of DP$_{Whole}$. Compare example a and example b in (20) and (21).

(20) a.   Taro-ga [[[**koohii ka kootya-no** futa-tu-no   nomimono-no]$_{DP}$ (uti-no)]$_{FP}$

      T-Nom   coffee   or tea-NO   two-Cl-NO drink-Gen   out-of

      [dottika hito-tu-no nomimono-o]]$_{DP}$ nonda.

      either   1-Cl-NO drink-Acc   drank

      'Taro drank either one of two drinks: coffee or tea.'

   b. * Taro-ga [[[futa-tu-no   **koohii ka kootya-no** nomimono-no]$_{DP}$ (uti-no)]$_{FP}$

      T-Nom   two-Cl-Gen coffee or tea-NO   drink-NO   out-of

      [dottika hito-tu-no nomimono-o]]$_{DP}$ nonda.

      either   1-Cl-NO drink-Acc   drank

(21) a.   Taro-ga [[[**koohii ka kootya-no** futa-tu-no   nomimono-no]$_{DP}$ (uti-no)]$_{FP}$

      T-Nom   coffee   or tea-NO   two-Cl-Gen drink-NO   out-of

      [dotti-no   nomimono-o]]$_{DP}$ nomi-masi-ta ka?

      which-NO drink-Acc   drink-Pol-past Q

      'Which drink did Taro drink: coffee or tea?'

b.* Taro-ga [[[futa-tu-no **koohii ka kootya-no** nomimono-no]~DP~ (uti-no)]~FP~

    T-Nom   two-Cl-Gen coffee or tea-NO   drink-NO   out-of

    [dotti-no   nomimono-o]]~DP~ nomi-masi-ta ka?

    which-NO drink-Acc   drink-Pol-past Q

The occurrences of DP~Whole~ in (20a) and (21a) are in fully realized forms, with the numeral + classifier and the noun. If the syntactic status of DisjP were similar to that of relative clauses, the word order in (20b) and (21b), in which DisjP is adjacent to the noun, would be expected to be possible. They are unacceptable, however. As will be discussed later, the semantics of the D~Whole~ head in the *either/or* and AltQ constructions is not the one in (13) since there is a DisjP in the SpecDP~Whole~ position. DisjP specifies the item denoted by the numeral + classifier and the noun in DP~Whole~. For example, in (20a), *coffee* and *tea* are an example of *two drinks*.

    The second item that has a special semantics in the *either/or* and AltQ constructions is the F head. As reviewed in Chapter 2 and illustrated in (22), *dottika* 'either' and *dotti* 'which' can only pick up one of two options.

(22) a. Taro-wa koohii ka kootya-no dottika (hito-tu)-o nonda.

           T-Top   coffee or tea-Gen   either   1-Cl-Acc drank

           'Taro drank either (one of) coffee or tea.'

    b. Taro-wa koohii ka kootya-no dotti-o nonda no?

           T-Top   coffee or tea-Gen   which drank Q

           'Which did Taro drink: coffee or tea?'

Later, it will be argued that the two expressions trigger the presupposition that one of two options is chosen. Thus, the improper partitivity meaning is already present in the sentence, rendering the semantics of the F head in (8) redundant. It becomes inevitable that the

semantics of the F head in the *either/or* and AltQ constructions is different from that in (8).

Building on the idea introduced in this section, the proposal for the semantics of the *either/or* and AltQ constructions in Japanese will be discussed next.

3.   Proposal: A Choice Function Analysis

3.1.   The Idea

This section introduces a choice function analysis of the Japanese *either/or* construction (1) and AltQs (2), repeated below.

(1)   Taro-ga   koohii ka kootya-no   dottika-o   nonda.

T-Nom   coffee or tea-NO   either-Acc drank

'Taro drank either coffee or tea.'

(2)   Taro-ga koohii ka kootya-no   dotti-o   nomi-masi-ta ka?   (AltQ/*YNQ)

T-Nom coffee or   tea-NO   which-Acc drink-Pol-past Q

'Which did Taro drink: coffee or tea?'

The idea is that DisjP has a set of alternatives introduced by *ka* 'or' as its denotation. For example, the semantic denotation of *koohii ka kootya* 'coffee or tea' in (1) and (2) is in (23).

(23)   ⟦ *koohii ka kootya* ⟧ = {coffee, tea}

Recall from Chapter 2 that the syntactic structure proposed for DisjPs in Japanese is as in (24), following the structure claimed by Jayaseelan (2014) and Mitrović and Sauerland (2016). There are two κPs that host the disjuncts and the particle *ka*, and a DisjP whose head is not overtly realized in Japanese.

(24)   The structure of a DisjP in Japanese

```
                    DisjP
              ┌───────┴───────┐
            κP            ┌───┴───┐
          ┌──┴──┐        Disj    κP
        XP     κ               ┌──┴──┐
        △      ka             YP    κ
                              △     ka
```
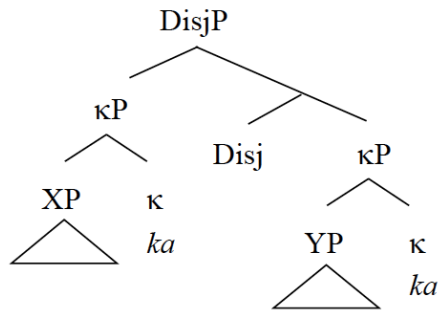
The denotation of DisjP is the set of the denotations of its disjuncts, adopting Alonso-Ovalle's (2006) analysis reviewed in Chapter 1. The precise semantics of the two functional layers, κP and DisjP, and how to compositionally derive the denotation of the whole structure, are left up to future investigations.[5]

One potential problem, however, is that a type mismatch arises when the verb takes a DisjP as its argument. In (1) and (2), the verb *nomu* 'drink' first needs an argument of type *e,* but if the verb were directly combined with a DisjP, it would not qualify as the argument of the verb, since it is of type $<e,t>$. The situation is exhibited in (25).[6]

(25)   ???
                          ┌────────┴────────┐
                  drink$_{<e,<e,t>>}$ DisjP$_{<e,t>}$

                                        {coffee, tea}
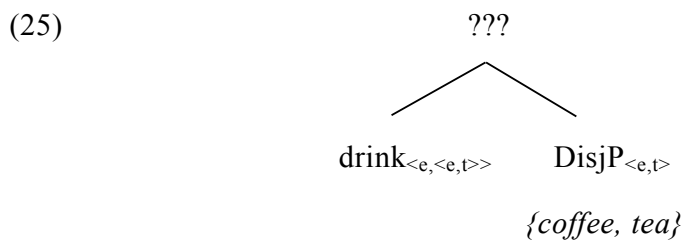
To avoid this problem, it is proposed that the items *dottika* 'either' and *dotti* 'which'

---

[5] In the Appendix, Mitrović and Sauerland's (2016) semantic analysis for *A mo B mo* 'A and B' is introduced, which is based on a two-layered structure like (24). It is, however, shown that their analysis is not straightforwardly extended to *A ka B ka* 'A or B' to derive a set *{A,B}*.

[6] Throughout the discussion, it is assumed that functions and sets are equivalent. A type $<e,t>$ can either be taken to denote a function that takes an individual and gives back a truth value, or a set of individuals. Thus, it is assumed that the set *{coffee, tea}* is equivalent to a function of type $<e,t>$: *λx. x = coffee or x = tea*.

introduce a choice function variable (Reinhart (1997)). A choice function variable takes a set (of elements of any type) and gives back one of its members. Assuming that this variable in the position of *dottika* 'either' is bound by an existential operator introduced higher in the structure, the proposed overall interpretation of (1) is as follows:

(26) $\exists$ f [Taro drank f ({coffee, tea})]: f $\in$ Chf

In this approach, we postulate a covert *dottika* 'either' in (1), even when it is unpronounced.

In the next section, previous studies that assign the semantics of a choice function variable to the existential particle *ka* and the question operator (Q-operator) *ka* are reviewed first. The present proposal is then introduced, in which *dotti* also denotes a set of choice function variables. The proposed analysis can not only explain the data in (1) and (2) but can also be extended to other data.

3.2.   *A Choice Function Analysis of* ka

Among past literature on the semantics of indeterminate expressions used in *wh* questions and indefinites, Hagstrom (1998) and Cable (2010) argue for a choice function analysis of the existential particle *ka* and the Q-operator *ka*. Although there are differences in the details of their analyses, the idea that they have in common is that indeterminate expressions (e.g. *dotti* in *dotti/dottika* 'which/either') introduce Hamblin alternatives and are closed by the choice function semantics of *ka*.

Let us briefly review the systems of Hagstrom (1998) and Cable (2010) for indefinites and *wh* questions. The data set these researchers used is described as follows:

(27) a.   John-ga nani-ka-o   katta.   (indefinites)

  J-Nom   what-Q-Acc   bought

  'John bought something.'

b.　John-ga　nani-o　　kai-masi-ta　　ka?　(*wh* questions)

　　J-Nom　what-Acc　buy-Pol-past　Q

　　'What did John buy?'

The basic idea of the two authors is that *ka* in *nani-ka* 'something' and the Q particle *ka* have the same semantic role of a choice function. Hagstrom (1998) proposes that in indefinites, *ka* has its own existential quantificational force and undergoes Quantifier Raising (and claims that this explains the intervention effect observed in sentences with indefinites). The trace of *ka* has the actual choice function semantics and serves to select one among the Hamblin-alternatives introduced by the indeterminate pronoun adjacent to it. The structure of (27a) is given in (28a), and its interpretation is computed compositionally, with the lexical items in (28b,c) and through the steps in (28d).[7]

(28) a.　Structure of (27a)

$$\text{TP}_{1\,<st>}$$
$$\text{TP}_{2\,<Chf,st>} \quad ka_{<<Chf,st>,st>}$$
$$\text{TP}_{3\,<st>} \quad i$$
$$\textit{John}_{<e>} \quad \text{DP}_{<e>} \quad \textit{bought}_{<e,<e,st>>}$$
$$\textit{nani}_{<e,t>} \quad t_{i\,<Chf>}$$
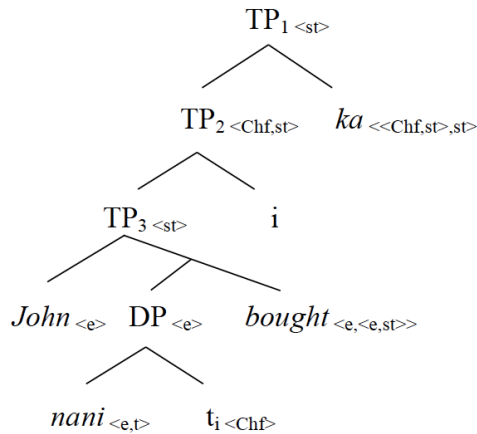
b.　⟦ *ka* ⟧　= $\lambda p_c.\ \lambda w.\ \exists f.\ p_c(f)(w)$　　　　　(Hagstrom (1998: 135))

　　　　(where p_c is of type <Chf, st>)

---

[7] Throughout the thesis, the choice function variable is given the semantic type *Chf*, which is typically a subtype of <<e,t>,e> but also includes any type of function where a set of elements of any type is taken as an argument and one of its members is returned. In the analysis presented in the next section, this restriction is stated as: *f is a choice function Chf(f) iff for all P in dom(f): P(f(P))*.

c. $[\![\,nani\,]\!] = \lambda x.\ \text{nonhuman}'\ (x)$ 　　　　(a set of nonhumans)

d. $[\![\,TP_1\,]\!] = [\![\,ka\,]\!]\ ([\![\,TP_2\,]\!])$

$\qquad = \lambda w.\ \exists f.\ [\![\,TP_2\,]\!]\ (f)(w)$

$\qquad = \lambda w.\ \exists f.\ \lambda f'.\ [\![\,TP_3\,]\!]^{g[i\to f']}\ (f)(w)$

$\qquad = \lambda w.\ \exists f.\ [\![\,TP_3\,]\!]^{g[i\to f]}\ (w)$

$\qquad = \lambda w.\ \exists f.\ \text{John bought}\ [\![\,DP\,]\!]^{g[i\to f]}\ \text{in}\ w$

$\qquad = \lambda w.\ \exists f.\ \text{John bought}\ f([\![\,nani\,]\!])\ \text{in}\ w$

$\qquad = \lambda w.\ \exists f.\ \text{John bought}\ f\ (\lambda x.\ \text{nonhuman}'\ (x))\ \text{in}\ w$

For the *wh* question in (27b), the difference from indefinites is minimal. In the *wh* question example, *ka* is assumed to undergo head movement to the C head, and the C^0+ka amalgam takes its complement as its argument and returns the semantics of a question. The lexical entry of C^0+ka is in (29a).[8] The structure of the whole sentence is in (29b), and the derivation proceeds as in (29c). The overall meaning of the sentence is a Hamblin-type semantics of *wh* questions (i.e. a set of propositions).

(29) a. $[\![\,C^0+ka\,]\!] = \lambda p_c.\ \lambda p.\ \exists f.\ p = p_c(f)$ 　　　　　(Hagstrom (1998: 138))

---

[8] Hagstrom (1998) claims that the denotation of the C^0+ka amalgam is derived compositionally from the semantics of C^0 in (i) and *ka* and (ii).
(i) $[\![\,C^0\,]\!] = \lambda Q.\ \lambda p_c.\ \lambda p.\ Q\ (\lambda g.\ p = p_c\ (g))$ 　　　　(Hagstrom (1998: 139))
(ii) $[\![\,ka\,]\!] = \lambda p_c.\ \lambda w.\ \exists f.\ p_c(f)(w)$
If we try to compose the two, however, (29a) is not the result of C^0 taking *ka* as its argument. This is because, after *ka* substitutes Q in (i), λw should remain after λp, and a world variable should remain as an argument of p_c, as seen from the derivation in (iii).
(iii) $[\![\,C^0+ka\,]\!] = \lambda p_c.\ \lambda p.\ [\lambda p_c.\ \lambda w.\ \exists f.\ p_c(f)(w)]\ (\lambda g.\ p = p_c\ (g))$
$\qquad\qquad\qquad = \lambda p_c.\ \lambda p.\ \lambda w.\ \exists f.\ [\lambda g.\ p = p_c\ (g)](f)(w)$
$\qquad\qquad\qquad = \lambda p_c.\ \lambda p.\ \lambda w.\ \exists f.\ p = p_c\ (f)(w)$
At the moment, there is no measure to modify this point of Hagstrom's (1998) discussion, but for now it is considered that Hagstrom (1998) assumes *ka* has another lexical entry without the world variable like the one in (iv), and the denotation in (29a) is used in the remainder of this chapter.
(iv) $[\![\,ka\,]\!] = \lambda p_c.\ \exists f.\ p_c(f)$

b. Structure of (27b)
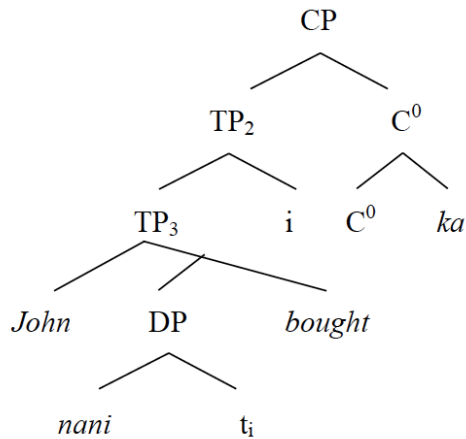
c. $[\![\text{CP}]\!] = [\![C^0]\!] ([\![TP_2]\!])$

$\quad = \lambda p.\ \exists f.\ p = [\![TP_2]\!]\ (f) \qquad \text{(by } [\![TP_2]\!] \text{ in (28d))}$

$\quad = \lambda p.\ \exists f.\ p = \text{John bought } f\ (\lambda x.\ \text{nonhuman}'\ (x))$

Cable (2010) refines Hagstrom's (1998) system by adopting focus alternative semantics and an extension of it to *wh* questions (Rooth (1985, 1992), Beck (2006)). The basic idea of focus alternative semantics is that focused items have two semantic values: an ordinary semantic value and a focus semantic value. For example, in sentence (30a), the focused item *John* has its ordinary denotation as its ordinary semantic value (30b) and a set of alternatives (of the same semantic type) as its focus semantic value (30c). A sentence that has a focused item also has an ordinary semantic value (30d) and a focus semantic value (30e), which is a set of propositions in which the position of the focused item varies according to the focus semantic value of the focused item.

(30) a. [John]$_F$ left.

  b. $[\![\text{John}_F]\!]^O = \text{John}$

  c. $[\![\text{John}_F]\!]^F = \{\text{John, Bill, Amelie, ...}\}$

  d. $[\![\text{John}_F \text{ left}]\!]^O = \lambda w.\ \text{John left in } w$

  e. $[\![\text{John}_F \text{ left}]\!]^F = \{p\colon p = \lambda w.\ x \text{ left in } w \mid x \in D\}$

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$$= \{\lambda w. \text{ John left in } w, \lambda w. \text{ Bill left in } w, \lambda w. \text{ Amelie left in } w, \ldots\}$$

Items that are not focused also have the two semantic values, but the focus semantic value is the singleton set of the ordinary semantic value. Indeterminate expressions, which are used in both indefinites and *wh* questions, only have a focus semantic value, which is a set of focus-alternatives. Thus, for example, the focus semantic value of *nani* 'what' is a set of nonhumans and that of *dare* 'who' is a set of humans.

As was the case in Hagstrom's (1998) analysis, *ka* introduces a choice function variable. *Ka* is a Q head and has the semantics of a choice function as in (31a). *Ka* and its sister are composed via a special composition rule in (31b).

(31) a. $[\![ka_i]\!]^g = g(i): g(i) \in D_{Chf}$ (cf. Cable (2010: 67))

    b. $[\![Q_i \text{ XP}]\!] = [\![Q_i]\!] ([\![\text{XP}]\!]^F)$ (Cable (2010: 68))

Since *ka* is a focus-sensitive operator and always takes as its argument the focus semantic value of its complement, it can successfully turn the focus semantic value of its complement into an ordinary semantic value.

For Cable (2010), *ka* in indefinites does not move, and the choice function variable introduced by *ka* is bound via Existential Closure higher up in the structure. The structure and the derivation of a sentence with indefinites (27a) are as in (32).

(32) a.   Structure of (27a)
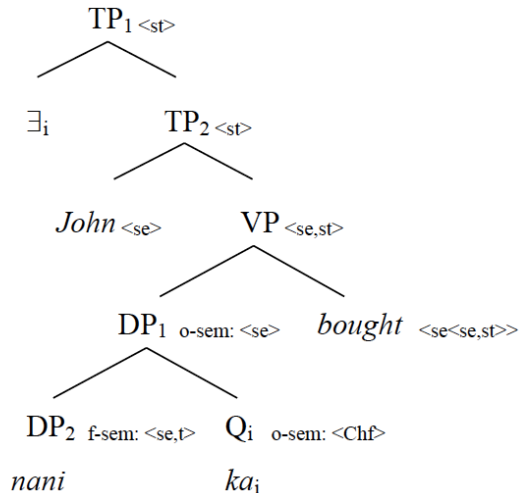
```
                        TP₁ <st>
                       /      \
                    ∃ᵢ       TP₂ <st>
                            /      \
                     John <se>    VP <se,st>
                                  /      \
                       DP₁ o-sem: <se>   bought <se<se,st>>
                      /        \
           DP₂ f-sem: <se,t>   Qᵢ o-sem: <Chf>
              nani              kaᵢ                           (cf. Cable (2010: 94))
```

b. $[\![\text{DP}_1]\!]^{g,w} = [\![ka_i]\!]^{g,w} ([\![\text{DP}_2]\!]^{g,w,F})$ (by the denotation of *ka* in (31a))

$= f(\{x: x \notin \text{HUMAN}_w\})$

c. $[\![\text{TP}_1]\!]^{g,w} = \lambda w.\ \exists f.\ [\![\text{TP}_2]\!]^{g,w}$

$= \lambda w.\ \exists f.\ [\![bought]\!]^{g,w} ([\![\text{DP}_1]\!]^{g,w}) ([\![John]\!]^{g,w})$

$= \lambda w.\ \exists f.\ \text{John bought } [\![\text{DP}_1]\!]^{g,w} \text{ in } w$

$= \lambda w.\ \exists f.\ \text{John bought } f(\{x: x \notin \text{HUMAN}_w\}) \text{ in } w$

With the lexical entry of *ka* in (31a), the special composition rule in (31b), and the idea that the focus semantic value of an indeterminate expression is a set of focus alternatives, the denotation of DP₁ is as in (32b). (32b) is the result of *ka* taking the focus semantic value of DP₂, the indeterminate *nani*. After the existential operator that binds the choice function variable is introduced by Existential Closure, the denotation of the whole sentence is as in the last line of (32c). Notably, since intensional semantics is used in the computation in Cable (2010), all lexical items are in their intension.

Another difference between Cable's (2010) system and Hagstrom's (1998) system arises from the fact that Cable (2010) adopts the focus alternative semantics approach for indeterminate pronouns. Since he also claims that *ka* takes as an argument the focus semantic value of its complement, the set of alternatives continues to "expand" via

Pointwise Functional Application until it is operated on by the choice function variable. Pointwise Functional Application is defined in (33), according to Kratzer and Shimoyama (2002) (Hamblin Functional Application in their terminology).

(33)   Pointwise Functional Application (Kratzer and Shimoyama (2002: 7))

If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{w,g} \subseteq D_\sigma$ and $[\![\gamma]\!]^{w,g} \subseteq D_{<\sigma,\tau>}$, then $[\![\alpha]\!]^{w,g} = \{a \in D_\tau: \exists b \; \exists c \; [b \in [\![\beta]\!]^{w,g} \; \& \; c \in [\![\gamma]\!]^{w,g} \; \& \; a = c(b)]\}$.

Pointwise Functional Application applies to two sets, for example, the focus semantic value of two sister nodes, where the set members of one set β can be the argument of the set members of the other set γ in terms of semantic types. It returns a set of elements made up of the outcome of combining each member of γ with each member of β.

In Cable's (2010) system, the set of alternatives expands up to the sister node of *ka* in *wh* questions, since the indeterminate expression and *ka* are not adjacent. (34a-i) show the structure of *wh* questions and how the interpretation is derived.

(34) a.   Structure of (27b)

(cf. Cable (2010: 95))

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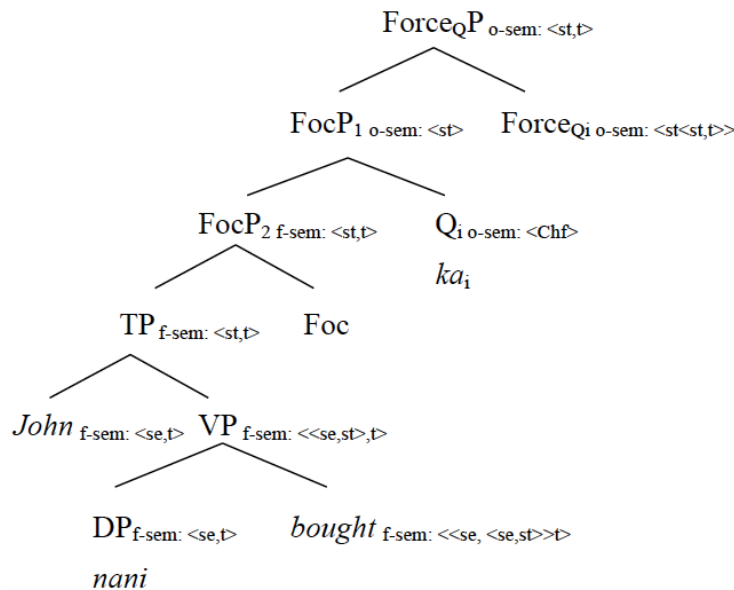
b. special composition rule

$[\![\, \text{Force}_{Qi}\ XP\,]\!]^{g,w} = \lambda p.\ \exists f.\ p = [\![\, XP\,]\!]^{g[i \to f],w}$ (cf. Cable (2010: 78))

c. $[\![\, \text{Force}_{Q}P\,]\!]^{g,w} = [\![\, \text{Force}_{Qi}\ \text{FocP}_1\,]\!]^{g,w}$

d. $\qquad = \lambda p.\ \exists f.\ p = [\![\, \text{FocP}_1\,]\!]^{g[i \to f],w}$

e. $\qquad = \lambda p.\ \exists f.\ p = [\![\, ka_i\,]\!]^{g[i \to f],w}\ ([\![\, \text{FocP}_2\,]\!]^{g[i \to f],w,F})$

f. $\qquad = \lambda p.\ \exists f.\ p = f\,([\![\, \text{TP}\,]\!]^{g[i \to f],w,F})$

g. $\qquad = \lambda p.\ \exists f.\ p = f\,(\{P(u)(v): P \in [\![\, bought\,]\!]^{g[i \to f],w,F}\ \&$

$\qquad\qquad\qquad u \in [\![\, nani\,]\!]^{g[i \to f],w,F}\ \&\ v \in ([\![\, John\,]\!]^{g[i \to f],w,F})\})$

h. $\qquad = \lambda p.\ \exists f.\ p = f\,(\{[\lambda y_e.\ \lambda z_e.\ \lambda w: z \text{ bought } y \text{ in } w](x)(John):$

$\qquad\qquad\qquad x \notin HUMAN_w\})$

i. $\qquad = \lambda p.\ \exists f.\ p = f\,(\{\lambda w.\ John \text{ bought } x \text{ in } w: x \notin HUMAN_w\})$

The Force_Q head has the semantics of questions and binds the choice function variable as in (34b). *Ka* resides inside FocP, which is selected by the Force_Q head.[9] Since *ka* is a focus-sensitive operator, the choice function variable introduced by *ka* takes the focus semantic value of FocP$_2$ as its argument, as in (34e). The Foc head only has a trivial semantic value, passing up the semantic value of its sister, so the focus semantic value of FocP$_2$ is that of TP, as shown in (34f). The denotation of the whole question in (34i) is a set of propositions where there is a choice function that takes a set of propositions of the form *John bought x*, *x* a nonhuman individual, and returns one member from that set. Assuming that the semantic denotation of questions is the set of their possible answers (cf. Hamblin (1973)), this is equivalent to the *wh* question interpretation.

In this section, analyses by Hagstrom (1998) and Cable (2010) have been introduced. The proposal of this thesis is next presented, namely, combining the idea that *ka* introduces a choice function variable with a choice function analysis of *dotti*. The analysis accounts

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[9] Cable (2010) assumes that *ka* moves to a position above the Focus head from its base position next to the indeterminate phrase and the lower copy is deleted but notes that this assumption is not crucial for his analysis.

for both the *either/or* construction data and AltQ/YNQ data.

3.3. *Proposal: A Choice Function Analysis of* Dotti

What happens if we try to extend Hagstrom's (1998) and Cable's (2010) system to the Japanese *either/or* and AltQ constructions? The possibility sought here is that the denotation of the indeterminate *dotti* is a set of choice functions, and Hagstrom's (1998) and Cable's (2010) system is applied to the rest of the structure.[10] The crucial part of the idea is that *ka* has the semantics of a choice function, as Hagstrom (1998) and Cable (2010) claim, and thus when *ka* directly combines with *dotti*, it picks out one of the choice functions from the set that *dotti* denotes.

Cable's (2010) claim that *ka* takes as an argument the focus semantic value of its sister, here *dotti*, is adopted. The two semantic values of *dotti* are given in (35). In the discussion hereafter, it is assumed that *f, f′,* and *f** are all choice functions (i.e. $f, f', f^* \in D_{Chf}$), where a function is a choice function *Chf(f)* iff for all *P* in dom(f): *P(f(P))*.[11]

(35) a. $[\![\textit{dotti}]\!]^{g,O}$ = undefined

     b. $[\![\textit{dotti}]\!]^{g,F} = \{[\lambda P_{<e,t>}. \lambda Q_{<e,t>}. f'(Q): |Q| = 2 \ \& \ P(f'(Q))]: f' \in D_{Chf}\}$

Similar to other indeterminate phrases in Japanese or *wh* phrases in other languages, it is claimed that the ordinary semantic value is undefined while the focus semantic value is a set. The focus semantic value is a set of functions with two arguments *P* and *Q* that return the result of the choice function variable *f′* taking *Q*. The first argument *P* is, as seen from the structure introduced below in (43c), the amalgam of the numeral classifier and the noun, and also generates a presupposition on the members of the set *Q*. *Q* is the denotation of

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[10] I thank Akira Watanabe and Seth Cable for pointing out this possibility.
[11] In the semantic denotations hereafter, "= 1" that means a proposition is true is omitted, for ease of understanding. For example, *P(f′(Q))* in (35b) should, strictly speaking, be *P(f′(Q)) =1*, meaning that *P* is true of *f′(Q)*.

DisjP, namely, a set of disjunct denotations. Since it is specified in the set notation after the second colon that f' is a choice function variable, after *dotti* takes all of its arguments, the result is a set of two meanings of the form $f(Q)$ differing in the value of f: for one, $f(Q)$ returns one of the two members of Q, and for the other, it returns the other member.

In (35b), there are two presuppositions regarding P and Q: the first is that the cardinality of Q is two, and the second is that P denotes a property true of $f'(Q)$. The first proposition, namely, that the cardinality of Q (which is the set denoted by DisjP) is two, is claimed to be a presupposition since, when the sentence is uttered in a context where this proposition is not true, the sentence ends up in presupposition failure. Consider the *either/or* example in (36) with three disjuncts in the DisjP.

(36) # Akai koodo ka aoi koodo ka kiiroi koodo-no dottika-o kiru to

   red cord or blue cord or yellow cord-NO either-Acc cut if

   bakudan-o kaijyo dekiru.

   bomb-Acc deactivate can

   '(Intended) Cutting the red cord, blue cord, or the yellow cord will deactivate the bomb.'

(36) with three choices presented by the DisjP would be judged as neither true nor false. Thus, the requirement that there be two choices in the context is a presupposition.[12]

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[12] A semantics in (ii), which minimally differs from (35), is assumed for *dotti* in sentence (i), introduced in Chapter 2, with no overt DisjP and *dotti* takeing only one argument.
(i) Dottika-no koodo-o kiru to bakudan-o kaijyo dekiru.
   either-NO cord-Acc cut if bomb-Acc deactivate can
   'Cutting either cord will deactivate the bomb.'
(ii) a. $[\![dotti]\!]^{g,O}$ = undefined
   b. $[\![dotti]\!]^{g,F}$ = $\{[\lambda P_{<e,t>}. \, f'(P): |P| = 2]: f' \in D_{Chf}\}$
When the focus semantic value of *dotti* in (iib) combines with *ka* in (i), the result is the single member of the set in (iib). The function then takes as its argument the denotation of *koodo* 'cord,' which is assumed to be of type $<e,t>$, that is, a set of individuals. The result that is returned functions as the argument of the predicate.

The requirement for *neither* and *both* that there be two options in the context has already been analyzed as a presupposition by Heim and Kratzer (1998). For instance, sentence (37) with *neither*, used as a determiner, is neither true or false when uttered in a context where there are three cats and none of them has stripes.[13]

(37)　　Neither cat has stripes.　　　　　　　　　　(Heim and Kratzer (1998: 154))

Heim and Kratzer (1998) take this as evidence that the sentence presupposes that there are two cats in the context, and suggest the denotation in (38) for *neither*. It is presupposed that the first argument, *cat* in (37), has a cardinality of two.

(38)　　$f_{neither} = \lambda A.\ \lambda B \in Pow(D).\ A \cap B = \varnothing: A \in Pow(D)\ \&\ |A| = 2$

　　　　　　　　　　　　　　　　　　　　(cf. Heim and Kratzer (1998: 154))

The second presupposition in the denotation of *dotti* in (35) is that P (corresponding to the numeral classifier + the noun) has to denote a property true of the item that the choice function variable gives back when it takes Q as its argument. That is, in (39), the speaker presupposes that each coffee and tea has to be a kind of drink.

(39)　　Taro-ga koohii ka kootya-no dottika hito-tu-no nomimono-o nonda.

　　　　T-Nom coffee or tea-Gen either 1-Cl-NO drink-Acc drank

　　　　'Taro drank either (one drink out of) coffee or tea.'

This content is assumed to be a presupposition since, if the disjuncts in (39) are turned into *kukkii* 'cookie' and *sembei* 'rice cracker' as in (40), the sentence feels neither true nor false,

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[13] I thank Akira Watanabe for bringing Heim and Kratzer's (1998) discussion on *neither* and *both* to my attention.

showing a behavior similar to (36) in a situation where it ends up in presupposition failure.

(40)   # Taro-ga kukkii ka sembei-no   dottika hito-tu-no nomimono-o nonda.
       T-Nom cookie or rice.cracker-Gen either 1-Cl-NO drink-Acc   drank

In *dottika* 'either,' the focus semantic value of *dotti* in (35b) directly becomes the argument of *ka*, which introduces a choice function variable, as proposed in Cable (2010). The result in (41) is equivalent to one of the functions in the set that *dotti* denotes.

(41) $[\![$ *dottika* $]\!]^g$ = f({$[\lambda P_{<e,t>}.\ \lambda Q_{<e,t>}.\ f'(Q): |Q| = 2\ \&\ P(f'(Q))]: f' \in D_{Chf}$ })

          $\approx \lambda P_{<e,t>}.\ \lambda Q_{<e,t>}.\ f^*(Q): |Q| = 2\ \&\ \text{for all } f^*, P(f^*(Q))$

From the denotation of *dotti* and *dottika* in (35) and (41), the choice function variable does the work of picking up a member from the set that DP_{Whole} denotes, and this essentially does the same semantic work as partitivity. Thus, the F head in (8), which denotes improper partitivity between its first and second argument in numeral partitives, would be redundant in the *either/or* and AltQ constructions if it had the same semantics as that in numeral partitives. The F head is taken in the two constructions as denoting an identity function, which takes an argument of any semantic type and returns the same object, as in (42).

(42) $[\![$ F $]\!]$ = $\lambda P_\sigma.\ P$

Next, we move on to how the computation proceeds inside the DP in the *either/or* construction. Recall from Chapter 2 that the DP in the *either/or* example (1), repeated in (43a), has the underlying structure in (43b) (= (4a)). On the assumption that lower copies of movement are interpreted in the semantic component, the structure that is interpreted is the one in (43c). A detailed structure has been added within *dottika* 'either' in (43c).

(43) a. Taro-wa   koohii ka kootya-no   dottika-o   nonda.   (*either/or* construction)

Taro-Top   coffee or tea-NO   either-Acc   drank

'Taro drank either coffee or tea.'

b. Structure of (43a) (= (4a))

DP_Part
- FP
  - DP_Whole
    - DisjP
      - *koohii ka kootya*
    - QP D
      - QP D *dottika*
        - CaseP Q
          - NP
            - *nomimono* #P Case
              - -*no*
              - 2 t_NP *tu*
  - F
- QP D
  - #P
    - 1
    - t_NP # *nomimono* t_#P
      - *tu*
  - CaseP Q
    - NP
      - Case -*o*
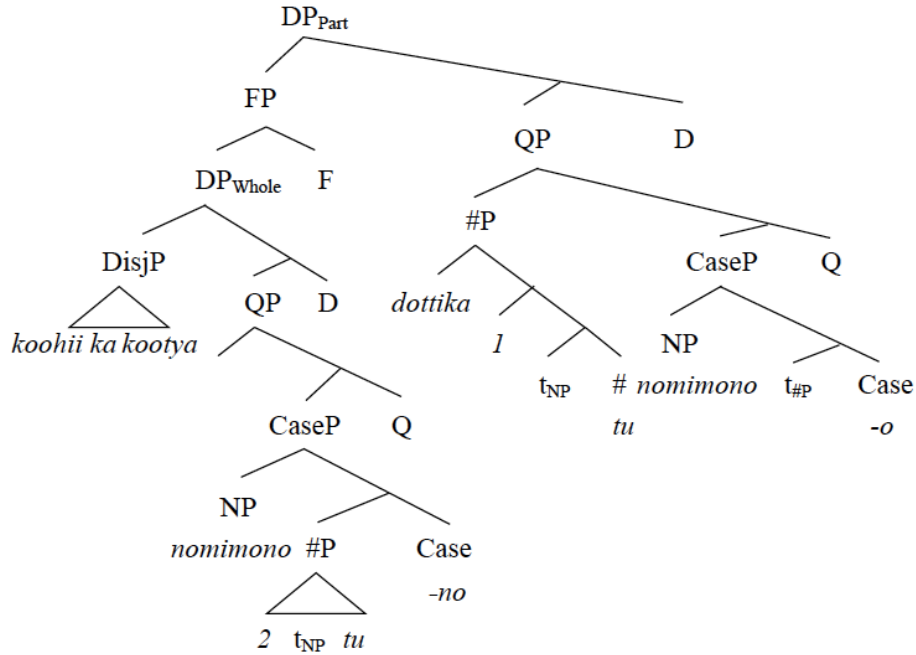
c. Structure of (43a) that is interpreted

DP_Part
- FP
  - DP_Whole
    - DisjP
      - *koohii ka kootya*
    - QP D
      - CaseP Q
        - #P Case -*no*
          - 2
          - NP #
            - *nomimono tu*
  - F
- QP D
  - CaseP Q
    - #P Case -*o*
      - X
        - *dotti ka*
      - 1 NP #
        - *nomimono tu*

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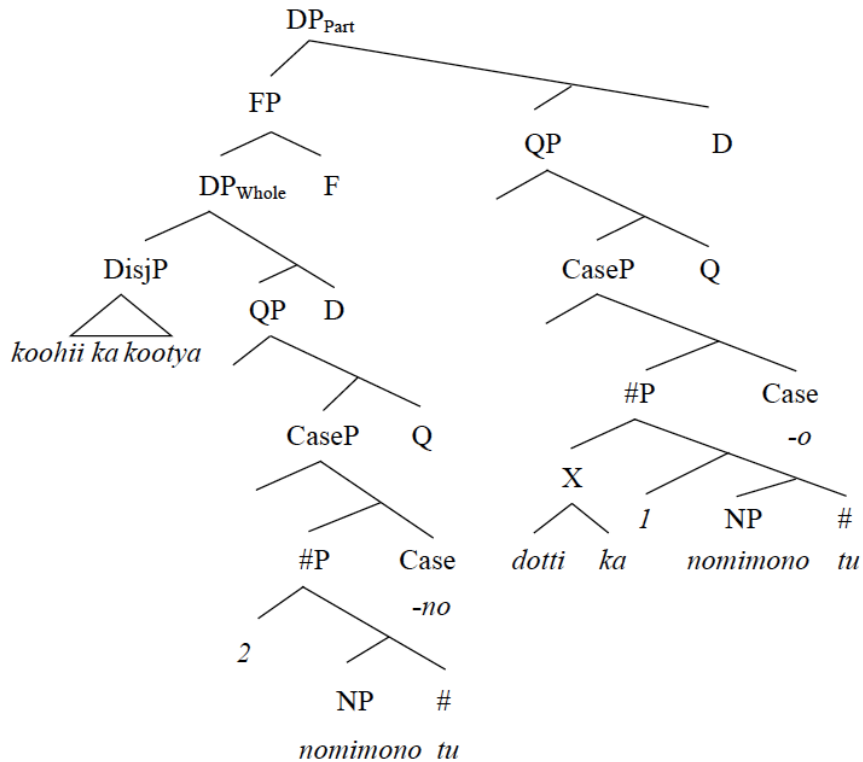
Within DP$_{\text{Whole}}$, the D$_{\text{Whole}}$ head introduces a presupposition that the content of QP is true of the disjuncts, as in (44).

(44)   [[D$_{\text{Whole}}$]] = λP$_{<e,t>}$. λQ$_{<e,t>}$. Q: P(*link*(Q))

The D head takes QP as its first argument, DisjP as its second argument, and gives back the DisjP with the presupposition that the QP is true of the outcome of applying the type-shifting operation *link* of Partee (1986) to the denotation of the DisjP. The operation *link* maps a set of individuals to a plural individual, as in (45).

(45)   *link* ({a,b}) = a⊕b   (cf. Partee (1986: 217))

The presupposition conveyed by (43c) is thus the proposition that the plural individual, consisting of coffee and tea, is a plurality of drinks and its cardinality is two.

This proposition is claimed to be a presupposition since it passes the test used earlier in this section. If the disjuncts are changed into items that are not drinks as in (46), the sentence does not seem to have a proper truth value. Thus, the proposition exhibits the same characteristics as presuppositions.

(46)   # Taro-ga kukkii ka sembei-no   nomimono futa-tu-no   dottika-o nonda.
         T-Nom   cookie or rice.cracker-NO drink   two-Cl-Gen   either-Acc drank

After we feed (44) with QP in (47a) and DisjP in (47b), the denotation of DP$_{\text{Whole}}$ is as in (47c).

(47) a.   [[QP]] = λx$_e$. x is a plurality of drinks and |x| = 2
     b.   [[DisjP]] = {coffee, tea}

c. $[[DP_{Whole}]] = \{coffee, tea\}$: $link(\{coffee, tea\})$ is a plurality of drinks

and $|link(\{coffee, tea\})| = 2$

For DP_{Part}, the numeral classifier + NP is the first argument and FP, which equals the denotation of DP_{Whole}, is the second argument of *dottika* 'either.' Recall that *dottika* 'either' denotes the functions that are the members of the set taken by a choice function variable, introduced by *ka*, as its argument. Consider the computation of DP_{Part} in (48).[14]

(48) a. $[[\textit{1-tu nomimono}]] = \lambda x_e.$ x is a drink, and $|x| = 1$

b. $[[\textit{dottika 1-tu nomimono}]]$

$= [[\textit{dottika}]] ([[\textit{1-tu nomimono}]])$

$= [f(\{[\lambda P_{<e,t>}. \lambda Q_{<e,t>}. f'(Q): |Q| = 2 \ \& \ P(f'(Q))]: f' \in D_{Chf}\})]$

$(\lambda x_e.$ x is a drink, and $|x| = 1)$

$\approx \lambda Q_{<e,t>}. f^*(Q): |Q| = 2 \ \&$ for all f^*, $f^*(Q)$ is a drink and $|\{f^*(Q)\}| = 1$

c. $[[DP_{Part}]]$

$= [[\textit{dottika 1-tu nomimono}]] ([[DP_{Whole}]])$

$\approx [\lambda Q_{<e,t>}. f^*(Q): |Q| = 2 \ \&$ for all f^*, $f^*(Q)$ is a drink and $|\{f^*(Q)\}| = 1]$

$(\{coffee, tea\})$

$= f^*(\{coffee, tea\}):$ for all f^*, $f^*(\{coffee, tea\})$ is a drink, and $|\{f^*(\{coffee, tea\})\}|$

$= 1$

---

[14] In (48b), the first argument of *dotti*, namely, *P*, corresponds to the numeral classifier + NP in (48a) and contributes to the content of the second presupposition. Note, however, that the example of the *either/or* construction introduced earlier in this chapter in (1) does not overtly contain the numeral classifier + NP in DP_{Part} (or DP_{Whole}).
(1)   Taro-ga   koohii ka kootya-no   dottika-o   nonda.
       T-Nom   coffee or tea-NO   either-Acc   drank
       'Taro drank either coffee or tea.'
In (1), the numeral + classifier + NP is assumed to have undergone ellipsis in DP_{Part}, since, as it is part of the presupposition invoked by *dotti*, the content is presupposed and is "given," satisfying the condition of ellipsis. I thank Akira Watanabe for pointing out the problem of ellipsis in (1).

Dottika 'either' in (41) is combined with the numeral classifier + NP in (48a), resulting in (48b). The last line of (48b) refers to a function that takes a set of individuals Q and returns the result of applying the choice function f^* to Q, where Q is a two-membered set, every member of Q is a (kind of) drink, and the member that the choice function f^* returns has a cardinality of one. Next, (48b) is combined with DP_{Whole} in (47c), and the overall denotation of DP_{Part} is shown in (48c). DP_{Part} is a choice function f^* that picks up a member from the set *{coffee, tea}*, where each member of *{coffee, tea}* is a (kind of) drink and the member that f^* returns has a cardinality of one.

In terms of semantic types, DP_{Part} can be the argument of a transitive verb, so we can calculate the semantics of sentence (43a), repeated in (49a). Assuming with Cable (2010) that the choice function variable is bound via Existential Closure, the denotation of the whole sentence is derived as in (49b,c).

(49) a. Taro-wa [$_{VP}$[$_{DP}$ koohii ka kootya-no dottika-o] nonda].

 Taro-Top coffee or tea-NO either-Acc drank

 'Taro drank either coffee or tea.'

 b. [[VP]] = λy. y drank f*({coffee, tea}): for all f*, f*({coffee, tea}) is a drink, and

|{f*({coffee, tea})}| = 1

 c. [[(49a)]] = ∃f*. Taro drank f*({coffee, tea}): for all f*, f*({coffee, tea}) is a drink,

and |{f*({coffee, tea})}| = 1

The overall meaning of (49c) is described as follows: there is a choice function f^* that picks up a member from the set of coffee and tea, where both coffee and tea are drinks and the member f^* picked up has a cardinality of one, and Taro drank this entity. Thus, the correct meaning of the whole sentence is derived.

Comparing the semantic computation of numeral partitives and the *either/or* construction shown so far, one salient difference between the two is the lexical entry of the

F head. As discussed in Section 2.2., there is a need to posit a different lexical entry for F in numeral partitives and the *either/or* construction, because the lexical items used in the constructions are different, especially *dottika* 'either.' The lexical entries of the F head proposed for numeral partitives and the *either/or* construction are repeated in (8) and (42).

(8) $[[F]] = \lambda x.\ \lambda y.\ [y \leq x]$

(42) $[[F]] = \lambda P_\sigma.\ P$

Notably, the two lexical entries are not interchangeable; that is, the F head in (8) cannot be used in the *either/or* construction, and the F head in (42) cannot be used in numeral partitives. F in (8) takes two arguments, whereas F in (42) is an identity function, so switching the two and using the wrong item ends in a type mismatch. Thus, there are two lexical entries for the F head, and the correct lexical entry has to be chosen to derive the correct interpretation of the sentence.

Examples in (50), repeated from Chapter 2, reinforce the point made here. In the *either/or* and AltQ constructions in (50b,c), *uti-no* 'out of' is optional, while in the numeral partitive example in (50a), it is obligatory, although there is variation among speakers.

(50) a. Taro-wa hondana-ni atta hon-no #(uti-no) san-satu-o yonda. (partitives)

         T-Top   bookshelf-on were book-NO out-of three-Cl-Acc read

         'Taro read three of the books on the bookshelf.'

     b. Taro-wa koohii ka kootya-no (uti-no) dottika-o nonda. (*either/or* construction)

         T-Top   coffee or tea-NO   out-of either-Acc drank

         'Taro drank either coffee or tea.'

     c. Taro-wa koohii ka kootya-no (uti-no) dotti-o   nomi-masi-ta ka? (AltQ)

         T-Top   coffee or tea-NO   out-of which-Acc drink-Pol-past Q

         'Which did Taro drink: coffee or tea?'

The fact that *uti-no* 'out of' is optional in the *either/or* and AltQ constructions is not surprising if the improper partitivity meaning, which is conveyed by the F head lexicalized as *uti-no* 'out of,' already exists in the constructions. We next move on to AltQs and demonstrate that the semantics proposed for the *either/or* construction is extended to AltQs and accounts for the AltQ/YNQ data.

3.4.   Applying the Analysis to AltQs and YNQs

For an AltQ in (51a), Cable's (2010) system in which *ka* is in the Q position, as in (51b), is adopted.

(51) a.   Taro-ga koohii ka kootya-no dotti-o   nomi-masi-ta ka?   (AltQ)

 T-Nom coffee or tea-NO   which-Acc drink-Pol-past Q

 'Which did Taro drink: coffee or tea?'

 b.   Structure of (51a)
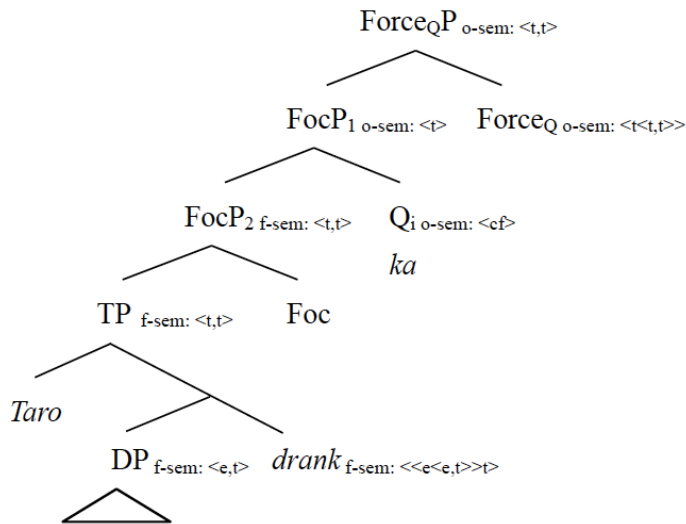
As seen from the simplified structure in (51b), *ka* takes a Focus Phrase (FocP) as its sister. Based on the structure in (51b), the focus semantic value of the elements in its sister is composed by Pointwise Functional Application. The alternatives expand up to the position where the choice function variable introduced by *ka* takes them as its argument.

Let us start from the computation inside the DP. Recall that the DP in (51a) has the underlying structure in (52a). As was the case for the *either/or* construction, the lower copy of movement is interpreted, so the structure in (52b) goes through semantic computation.

(52) a. Structure of DP

b. Structure that is interpreted

```
                        DP_Part
                       /      \
                 FP             \
                /  \        QP        D_Part
          DP_Whole   F     /  \      /  \
          /    \          CaseP    Q
      DisjP     \        /   \
     /  \        QP   D_Whole #P    Case
  koohii ka kootya   /  \    /  \    -o
              CaseP   Q  dotti  NP    #
             /   \          nomimono
           #P    Case
          /  \    -no
         2    NP   #
          nomimono  tu
```
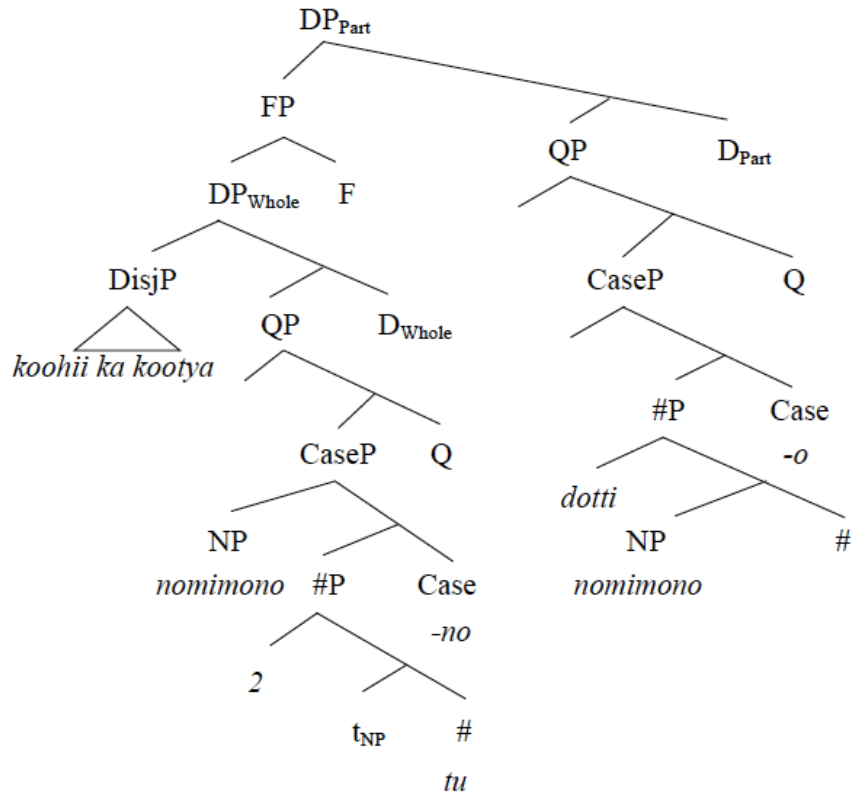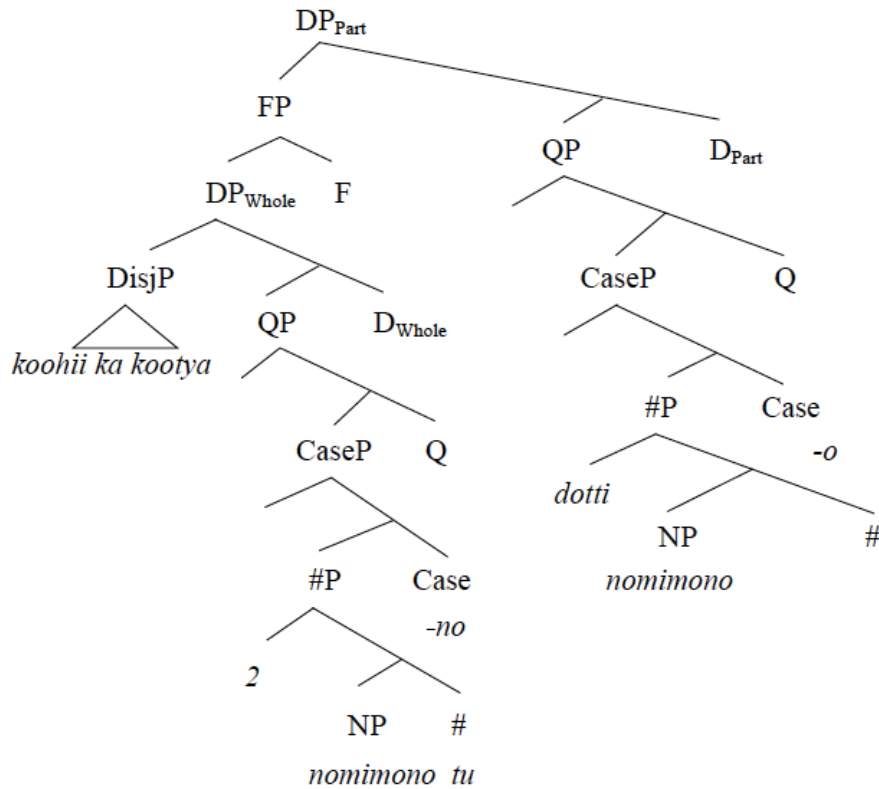
The denotation of DP_{Whole} is derived in mostly the same way as that in the *either/or* construction described in (47). One important aspect in which the DP_{Whole} in AltQs differs from that in the *either/or* construction is that, since *ka* is higher up in the structure as in Cable's (2010) system, for everything in the sister of *ka*, their focus semantic value will be made use of during the computation. For example, the D_{Whole} head contains the two semantic values in (53).

(53) a. $[\![D_{Whole}]\!]^O = \lambda P_{<e,t>}.\ \lambda Q_{<e,t>}.\ Q: P(Q)$

b. $[\![D_{Whole}]\!]^F = \{[\lambda P_{<e,t>}.\ \lambda Q_{<e,t>}.\ Q: P(Q)]\}$

Since none of the elements in DP_{Whole} is focused, the focus semantic value is the singleton set of the ordinary semantic value for all elements, as depicted in (53) and (54a,b). By Pointwise Functional Application, the focus semantic value of DP_{Whole} is the set containing

the set of coffee and tea, as in (54c).

(54) a.　$[\![\text{QP}]\!]^O = \lambda x_e.$ x is a plurality of drinks, and $|x| = 2$

　　　　$[\![\text{QP}]\!]^F = \{\lambda x_e.$ x is a plurality of drinks, and $|x| = 2\}$

　　b.　$[\![\text{DisjP}]\!]^O = \{\text{coffee, tea}\}$

　　　　$[\![\text{DisjP}]\!]^F = \{\{\text{coffee, tea}\}\}$

　　c.　$[\![\text{DP}_{\text{Whole}}]\!]^O = \{\text{coffee, tea}\}$: $link(\{\text{coffee, tea}\})$ is a plurality of drinks and

$$|link(\{\text{coffee, tea}\})| = 2$$

　　　　$[\![\text{DP}_{\text{Whole}}]\!]^F = \{[\{\text{coffee, tea}\}$: $link(\{\text{coffee, tea}\})$ is a plurality of drinks and

$$|link(\{\text{coffee, tea}\})| = 2]\}$$

Likewise, elements in DP_{Part} are computed in a way analogous to those in the *either/or* construction in (48), but in AltQs, their focus semantic values are taken into consideration. *Dotti*, repeated in (55a), and *nomimono* 'drink' in (55b) are combined, and the result is described in (55c).

(55) a.　$[\![\textit{dotti}]\!]^O = $ undefined

　　　　$[\![\textit{dotti}]\!]^F = \{[\lambda P_{<e,t>}.\ \lambda Q_{<e,t>}.\ f'(Q): |Q| = 2\ \&\ P(f'(Q))]: f' \in D_{\text{Chf}}\}$

　　b.　$[\![\textit{nomimono}]\!]^O = \lambda x_e.$ x is a (plurality of) drink(s)

　　　　$[\![\textit{nomimono}]\!]^F = \{\lambda x_e.$ x is a (plurality of) drink(s)$\}$

　　c.　$[\![\textit{dotti nomimono}]\!]^O = $ undefined

　　　　$[\![\textit{dotti nomimono}]\!]^F$

　　　　$= \{S(v): S \in [\![\textit{dotti}]\!]^F\ \&\ v \in [\![\textit{nomimono}]\!]^F\}$

　　　　$= \{[\lambda P.\ \lambda Q.\ f'(Q): |Q| = 2\ \&\ P(f'(Q))]\ (\lambda x.$ x is a (plurality of) drink(s))$: f' \in D_{\text{Chf}}\}$

　　　　$= \{[\lambda Q.\ f'(Q): |Q| = 2\ \&\ f'(Q)$ is a (plurality of) drink(s)$]: f' \in D_{\text{Chf}}\}$

(55c) and DP_{Whole} in (54c) (after it is combined with the F head, which is an identity

function as in (42)) are computed via Pointwise Functional Application, resulting in the semantics of DP$_{Part}$ in (56).

(56)   [[DP$_{Part}$]]^O = undefined

[[DP$_{Part}$]]^F = {[f'({coffee, tea}): |{coffee, tea}| = 2 & f'({coffee, tea}) is a

(plurality of) drink(s)]: f' ∈ D$_{Chf}$}

As discussed above, the focus semantic value of DP$_{Part}$ enters further computation with the rest of TP. Note that the focus semantic value of DP$_{Part}$ is of type $<e,t>$, as displayed in the structure in (51b).

Now we can derive the semantics of the entire sentence. The two semantic values of *Taro* and *nonda* 'drank' are in (57a,b), and the overall semantics of TP is in (57c).

(57) a.   [[Taro]]^O = Taro

[[Taro]]^F = {Taro}

b.   [[*nonda*]]^O = λy. λx. x drank y

[[*nonda*]]^F = {λy. λx. x drank y}

c.   [[TP]]^O = undefined

[[TP]]^F = {[Taro drank f'({coffee, tea}): |{coffee, tea}| = 2 & f'({coffee, tea}) is

a (plurality of) drink(s)]: f' ∈ D$_{Chf}$}

The focus semantic value of TP, on the assumption that the Foc head is an identity function, is taken by *ka* as its argument.

Recall that in Cable's (2010) system, there is a special composition rule for the Force$_Q$ head and its sister, repeated in (58a). With this rule, the index on *ka* is assigned a choice function variable *f,* and the choice function variable is bound by an existential quantifier higher in the structure. In (58e), we use the focus semantic value of TP in (57c), and the

denotation of the overall sentence is in (58f).

(58) a.   special composition rule

$[\![\ \text{Force}_{Qi}\ \text{XP}\ ]\!]^{g,w} = \lambda p.\ \exists f.\ p = [\![\ \text{XP}\ ]\!]^{g[i \to f],w}$ (cf. Cable (2010: 78))

b. $[\![\ \text{Force}_{Q}\text{P}\ ]\!]^{g,w} = [\![\ \text{Force}_{Qi}\ \text{FocP}_1\ ]\!]^{g,w}$

c. $= \lambda p.\ \exists f.\ p = [\![\ \text{FocP}_1\ ]\!]^{g[i \to f],w}$

d. $= \lambda p.\ \exists f.\ p = [\![\ ka_i\ ]\!]^{g[i \to f],w}\ ([\![\ \text{FocP}_2\ ]\!]^{g[i \to f],w,F})$

e. $= \lambda p.\ \exists f.\ p = f\ ([\![\ \text{TP}\ ]\!]^{g[i \to f],w,F})$

f. $= \lambda p.\ \exists f.\ p = f\ (\{[\text{Taro drank } f'(\{\text{coffee, tea}\}): |\{\text{coffee, tea}\}| = 2\ \&$

                $f'(\{\text{coffee, tea}\})$ is a (plurality of) drink(s)]: $f' \in D_{Chf}\})$

The denotation in (58f) amounts to the set of propositions *{Taro drank coffee, Taro drank tea}*, and assuming that a question denotes the set of possible answers (cf. Hamblin (1973)), this is equivalent to the AltQ interpretation.

Thus, we have successfully derived the AltQ interpretation by adopting Cable's (2010) system and assigning *dotti* the semantics *{[λP$_{<e,t>}$. λQ$_{<e,t>}$. f′(Q): |Q| = 2 & P(f′(Q))]: f′ ∈ D$_{Chf}$}*. The proposed denotation of *dotti* as a *wh*-expression having a focus semantic value but no ordinary semantic value conforms to how *wh* words are treated in general by Cable (2010): They are considered to indicate sets of focus alternatives (e.g., *nani* 'what' referring to a set of things in (28c)).

Earlier in this chapter, data regarding the availability of AltQ and YNQ interpretations were introduced. From (2) and (3) repeated below, a sentence is unambiguously an AltQ when *dotti* is used, while a sentence is unambiguously a YNQ when *dottika* 'either' is used or neither of the two is in the sentence. In (3), everything in the structure (except the Q particle) is the same as the *either/or* construction we have examined above in (49a).

(2)　　Taro-ga　koohii　ka　kootya-no dotti-o　　　nomi-masi-ta　ka? **(AltQ/*YNQ)**

　　　T-Nom　coffee　or　tea-NO　　which-Acc　drink-Pol-past　Q

　　　'Which did Taro drink: coffee or tea?'

(3)　　Taro-ga　koohii　ka　kootya(-no dottika)-o　nomi-masi-ta　ka? **(*AltQ/YNQ)**

　　　T-Nom　coffee　or　tea-NO　　either-Acc　drink-Pol-past　Q

　　　'Did Taro drink either coffee or tea?'

(49) a.　Taro-wa　[$_{VP}$ [$_{DP}$ koohii　ka　kootya-no dottika-o]　nonda]. (*either/or* construction)

　　　Taro-Top　　　coffee　or　tea-NO　　either-Acc drank

　　　'Taro drank either coffee or tea.'

In (3), *dottika* 'either' is claimed to be present, even when it is covert. It is shown how the sentence unambiguously becomes a YNQ when this overt or covert *dottika* 'either' is in the sentence.

　　The denotation of (49a) is repeated in (49c) below.

(49) c.　[[(49a)]] = $\exists$f*. Taro drank f*({coffee, tea}): f*({coffee, tea}) is a drink, and

　　　　　　　　　　　　　　　　|{f*({coffee, tea})}| = 1, where f* $\in$ D$_{Chf}$

Since this is the denotation of TP in (3) that the Q operator takes as its argument, the Q operator for YNQs is analyzed to take a proposition as its argument. This is opposed to TP that *ka* takes as its argument in the AltQ in (51b), whose denotation is in (57c). (57c) is a set of propositions.

　　In (3), there is a Q particle that has a different semantic role from the Force$_{Q}$P or *ka* in AltQs, and this Q particle derives the YNQ interpretation. YNQs are assumed to have fewer functional projections than AltQs, and only the Q operator in the C head position takes the TP, as shown in (59).

(59)   Structure of YNQs

```
              CP
           ___/\___
          /        \
        TP          C
       /__\         Q
```
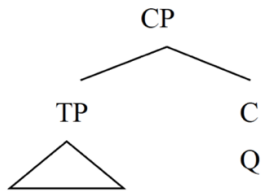
This Q particle comes into the structure when the TP denotes a proposition (not a set of propositions), and the semantics for the YNQ-type Q operator in (60) is proposed. The YNQ-type Q operator has a special semantic denotation that takes a single proposition and gives back the set of it and its negation as the question interpretation.

(60) $[[Q_{YNQ}]] = \lambda p. \{p, \neg p\}$

The idea that YNQs denote a set of a proposition and its negation is not a new one. Hamblin (1973), for example, claims that YNQs have "is it the case that…" as a prefix and that the denotation of "is it the case that *a*" is a set consisting of the denotation of *a* and the denotation of the negation of *a*.

Let us see how the YNQ interpretation is derived for (61a) (= (3)).[16] The denotation of TP is the same as the *either/or* construction, as in (61b). The Q operator in (60) takes this as its argument, and the outcome is depicted in (61c).

(61) a.   [$_{TP}$ Taro-ga koohii ka kootya-no dottika-o nomi-masi-ta] ka? **(*AltQ/YNQ)**

         T-Nom   coffee or   tea-NO   either-Acc drink-Pol-past Q

    'Did Taro drink either coffee or tea?'

   b. $[[TP]] = \exists f^*.$ Taro drank f*({coffee, tea}): f*({coffee, tea}) is a drink, and

                    $|\{f^*(\{coffee, tea\})\}| = 1$, where f* $\in D_{Chf}$

---

[16] Since the present proposal is that *dottika* 'either' is present even when it is covert, only data with the overt *dottika* 'either' are considered.

c. $[\![(61a)]\!] = \{\exists f^*.$ Taro drank $f^*(\{coffee, tea\}):f^*(\{coffee, tea\})$ is a drink, and

$|\{f^*(\{coffee, tea\})\}| = 1$, where $f^* \in D_{Chf}$, $\neg\exists f^*.$ Taro drank

$f^*(\{coffee, tea\}): f^*(\{coffee, tea\})$ is a drink, and $|\{f^*(\{coffee, tea\})\}|$

$= 1$, where $f^* \in D_{Chf}\}$

The overall denotation of the sentence is a set of two propositions: There is a member of

the set *{coffee, tea}* that Taro drank, and there is not a member of the set *{coffee, tea}* that

Taro drank. This interpretation is the YNQ interpretation.

Thus far, it has been demonstrated that the present proposal accounts for the semantics

of the Japanese *either/or* construction and the distribution of AltQ/YNQ interpretations.

There were two Q-particles employed in the two types of questions: *ka* in AltQs, which

introduces a choice function variable, and *ka* in YNQs, which takes a single proposition

and gives back the set consisting of it and its negation. As noted above, the present proposal

is that *ka* in AltQs takes a set of propositions and derives an AltQ reading, while *ka* in

YNQs takes a single proposition and derives a YNQ reading. What remains to be seen is

whether the two *ka*'s do not derive unintended readings when placed in other environments.

What happens if the AltQ-type *ka* is used in (3)? In this case, the AltQ-type *ka* ends

up with a proposition (and not a set of propositions) as its argument. However, this results

in a type clash, since the AltQ-type *ka*, which introduces a choice function variable,

requires a set as its argument. Thus, the AltQ-type *ka* is blocked from appearing in (3).

Using the YNQ-type *ka* in (2) also leads to a problematic situation. Recall that the

denotation of the TP ($=$ FocP$_1$) of (2) is as in (57c). The YNQ-type *ka* selects as its argument

the ordinary semantic value of its sister, but the ordinary semantic value of TP is undefined.

Even if we adopt additional assumptions and claim that the YNQ-type *ka* can take as its

argument the focus semantic value of its sister, the focus semantic value of TP is a set of

propositions as in (57c), and cannot be combined with the YNQ-type *ka* in (60). Either way,

the calculation ends up being a type clash. AltQ-type *ka* can only appear when its sister

denotes a set, and the YNQ-type *ka* can only appear when its sister denotes a single proposition, deriving the intended readings in only the required sentences.

Before closing this section, let us return to a data set introduced in Chapter 2, which is compatible with the present analysis. Recall that in the *either/or* and AltQ constructions, *to* 'and' and *ka* 'or' are only interchangeable when *dottika/dotti* 'either/which' is present. It seems that in (62), where *dottika* 'either' or *dotti* 'which' is present, *to* 'and' and *ka* 'or' are interchangeable because they lose their conjunction/disjunction meaning.[17]

(62) a. Taro-wa [koohii {to/?ka} kootya {to/?ka}]-no **dottika**-o nonda.

       Taro-Top coffee and/or tea and/or-Lin either-Acc drank

       'Taro drank either coffee or tea.'

   b. Taro-wa [koohii {to/?ka} kootya {to/?ka}]-no **dotti**-o nomi-masi-ta ka?

       Taro-Top coffee and/or tea and/or-Lin which-Acc drink-Pol-pastQ

       'Which did Taro drink: coffee or tea?'

When we do not use *dottika/dotti* 'either/which' as in (63), naturally, *to* means 'and' and *ka* means 'or,' and in (63b), the question does not retain its AltQ meaning and becomes a YNQ.

---

[17] Building on ASL data like (i), in which the "general use coordinators" can convey either the conjunction or disjunction meaning, Davidson (2013) asserts that in ASL, both conjunction and disjunction have the semantic function of a set union.
(i) a. COORD-L_1 [POSS$_a$ PARENTS WILL BUY POSS$_a$CAR] COORD-L_2 [IX$_a$ WILL TRAVEL], DON'T-KNOW WHICH
     'Her parents will buy her car or she will travel, I'm not sure which.'
   b. HAPPEN? COORD-L_1 [POSS$_a$ PARENTS WILL BUY POSS$_a$CAR] COORD-L_2 [IX$_a$ WILL TRAVEL]
     'What will happen? Her parents will buy her car, and (then) she will travel.'
                                    (Davidson (2013: 7))
According to Davidson (2013), the conjunctive/disjunctive force of the coordinator is provided by an external source, namely, a universal/existential quantifier given by context or a lexical item. We can relate this claim to the present proposal by saying that in Japanese, the existence of the universal/existential quantifier, which quantifies over the set denoted by the Conjunction Phrase or the DisjP, is overtly indicated by the universal/existential particle *mo/ka*. I thank Akira Watanabe for bringing Davidson's (2013) paper to my attention.

(63) a. Taro-wa   [koohii {to/ka} kootya {to/ka}]-o   nonda.

      Taro-Top coffee and/or tea   and/or-Acc drank

      'Taro drank {coffee and tea/coffee or tea}.'

    b. Taro-wa   [koohii {to/ka} kootya {to/ka}]-o   nomi-masi-ta ka?

      Taro-Top coffee and/or tea   an /or-Acc drink-Pol-past Q

      'Did Taro drink {coffee and tea/coffee or tea}?'

The present proposal that *dottika* 'either' and *dotti* 'which' have the semantic role of introducing choice function variables, which take the set of the disjuncts as its argument, combined with the assumption that both the DisjP and the Conjunction Phrase denote the set of its disjuncts/conjuncts, explains the data set. The fact that we can account for the data is an advantage of the choice function analysis, although there remains the problem of how disjunction and conjunction can be distinguished from each other when *dottika* 'either' and *dotti* 'which' are not present.[18]

4. Summary of the Chapter

In this chapter, the semantic proposal of this thesis has been presented, namely a choice function analysis of *dotti*. Combined with previous examinations whereby *ka* introduces a choice function variable, the present analysis accounts for the Japanese *either/or* construction and AltQ/YNQ data. In the next chapter, we turn to English data and compare them with Japanese data, and further delve into the possibility of extending the proposed analysis of Japanese data to English data.

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[18] There is also the problem that in sentences with *dottimo* 'both,' the interchangeability between *to* 'and' and *ka* 'or' disappears. Only *to* 'and' is acceptable as in (i), and no account is provided to establish the fact at this point.
(i) Taro-wa [koohii {to/*ka} kootya {to/*ka}]-no **dottimo**-o nonda.
    T-Top   coffee and/or   tea   and/or-NO both-Acc   drank
    'Taro drank both coffee and tea.'

**Appendix: A Compositional Semantics of DisjPs**

Recall that a syntactic structure in (64) for DisjPs in Japanese is adopted, which has two κPs that host the disjuncts and the particle *ka*, and a DisjP whose head is not overtly realized in Japanese, and that it is assumed that the denotation of a DisjP is a set of the disjunct denotations.

(64)   The structure of a DisjP in Japanese
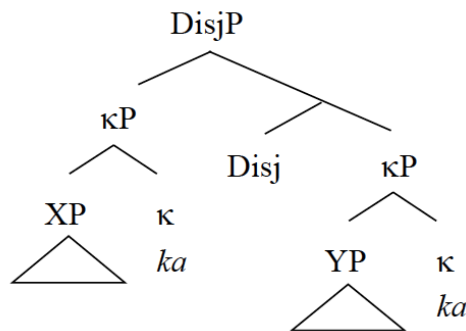
What semantic role should the Disj head and the κ head have to derive a semantics of the set of disjunct denotations as the denotation of the DisjP? One possibility is to extend the analysis of Mitrović and Sauerland (2016) for *A mo B mo* 'A and B.' They give the decomposed structure in (65) for the Japanese phrase involving the conjunction *Bill mo Mary mo* 'Bill and Mary.'

(65)   Structure of *Bill mo Mary mo* 'Bill and Mary'
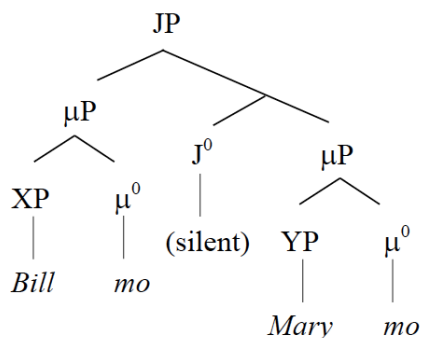
(Mitrović and Sauerland (2016:477))

According to Mitrović and Sauerland (2016), languages are classified into those with an overt μ head such as the Japanese *mo*, which can be used as a quantificational or a focus particle, and those with an overt J(unction) head, such as English, which can be used when the coordinated items are individuals and when the coordinated items are propositions. The denotations of the two heads are in (66) in the notation adopted in this thesis.

(66) a. $[\![\,\mu^0\,]\!] = \lambda R_{<e,t>}. \{S_{<e,t>}: R \subseteq S\}$

   b. $[\![\,J^0\,]\!] = \lambda Q_{1<et,t>}. \lambda Q_{2<et,t>}. Q_1 \cap Q_2$ (cf. Mitrović and Sauerland (2016:477))

With the help of the type-shifting operation from $<e>$ to $<e,t>$ at the XP/YP level, the individuals *Bill* and *Mary* are shifted to their characteristic properties and can be combined with μ^0. The denotation of the two μPs in (65) are as in (67a). The denotations in (67a) refer to the set of sets containing Bill and the set of sets containing Mary, which means the set of properties that hold of Bill and the set of properties that hold of Mary.

(67) a. $[\![\,Bill\ \mu^0\,]\!] = \{S_{<e,t>} : \{Bill\} \subseteq S\}$

      $[\![\,Mary\ \mu^0\,]\!] = \{S_{<e,t>} : \{Mary\} \subseteq S\}$

   b. $[\![\,JP\,]\!] = \{S: Bill \in S\ and\ Mary \in S\}$

After the intersection of the two sets is taken by the J head, the overall denotation of JP is as in (67b), which is the set of properties that hold of both Bill and Mary.

A simple extension of Mitrović and Sauerland's (2016) analysis to the disjunction structure *A ka B ka* 'A or B' would be to assign the κ head the same denotation as the μ head in (66a), whereas the Disj head denotes set union, as opposed to the denotation of the J head in (66b). The outcome of combining the lexical items is in (68), a set of sets that Bill or Mary is a member of. This outcome is equivalent to the second line of (68), a set of sets that has at least some intersecting element with the set *{Bill, Mary}*.

(68) $[\![$ DisjP $]\!]$ = {S: Bill $\in$ S or Mary $\in$ S}

$\approx$ {S: {Bill, Mary} $\cap$ S $\neq \varnothing$}

However, (68) is clearly not identical to *{Bill, Mary}*, and is not the denotation needed in the present analysis. I leave for future investigation to determine what semantic roles are necessary for the two functional heads in (64) in order to derive a denotation of a set of disjunct denotations for a DisjP.

Chapter 4

A Comparison between English and Japanese

Preceding chapters have mainly focused on Japanese data and only occasionally referred to English data. In this chapter, the two languages are compared, and we examine how the two languages differ syntactically and semantically, as well as with what kind of analysis the differences can be accounted for. The goal of this chapter is to show that even though there are syntactic and semantic differences between English and Japanese, the data are explained by similar syntactic and semantic analyses. The differences arise from differences in the nature of lexical items and a syntactic operation, namely, ellipsis.

First, data concerning the syntax and semantics of the *either/or* construction and Alternative Questions (AltQs) in English and Japanese are introduced in Section 1. Among them are "*either*-floating," which appears in English but not in Japanese, the distribution of narrow scope and wide scope *or* readings, and the surface forms that allow AltQ and Yes/No Question (YNQ) readings. Then, Section 2 presents my proposal for the syntax and semantics of the English *either/or* and AltQ constructions. For the syntax, it is demonstrated that the syntactic structure of the English constructions parallels that of the Japanese constructions. There are two points where the two languages differ: the syntactic category of the items *either* and *dottika* 'either,' and how much ellipsis is allowed. For the semantics, a semantic analysis of *either* introducing a choice function variable, combined with the syntactic analysis presented earlier, accounts for the data set. The discussion reveals that *either*, a covert wh variable in English AltQs, and *dottika/dotti* 'either/which' all have a similar semantic role, namely, introducing choice function variables. Section 3 concludes the chapter.

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1. Comparing the *Either/or* Construction and AltQ Data between English and Japanese

1.1. Syntax

This section introduces two data sets concerning the syntax of the *either/or* construction and AltQs in English and Japanese. The first is the phenomenon called *either*-floating, in which *either* is dislocated from the Disjunction Phrase (DisjP). The second is data showing that in both English and Japanese, a variety of syntactic categories and structures can serve as the disjuncts in DisjPs.

1.1.1. Either-*Floating*

In English, there is a phenomenon dubbed *either*-floating in Den Dikken (2006). As depicted in (1), *either* can occur in various positions.[1] The resulting form is unbalanced disjunction in which the surface size of the disjuncts is not the same (on the assumption that the position of *either* marks the left edge of the first disjunct).

(1) a. Taro gave Mary **either** an apple or an orange.

   b. Taro **either** gave Mary an apple or an orange.

   c. **Either** Taro gave Mary an apple or an orange.   (cf. Larson (1985: 220))

In (1b), the disjuncts are *gave Mary an apple* and *an orange*, and in (1c), *Taro gave Mary an apple* and *an orange*. However, in both sentences, under plausible assumptions (i) that coordinands have to be of the same syntactic category (Law of Coordination of Likes), and (ii) that the second element is *an orange*, the the base position of *either* should be the position of *either* in (1a). It should then be the case that *either* undergoes movement to its overt position, and thus the phenomenon is called "*either*-floating."

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[1] Some native speakers report that the sentence in which *either* floats up to the sentence-initial position is marked for them.

Either can float as in (1), but the direction of the floating phenomenon is not restricted to the left, as Den Dikken (2006) observes. (2b,c) are examples of what he calls "L-*either*." In the sentences, the disjuncts that *or* connects should be *rice* and *beans*.

(2) a.　John ate either rice or beans.

　　b.　John either ate rice or beans.　　　　(L-*either*)

　　c.　Either John ate rice or beans.　　　　(L-*either*)

On the assumption that *either* is base-generated in a position adjacent to the DisjP, *either* in both sentences is placed in a position to the left of the DisjP in its base position. The positions where *either* occurs in (2b,c) are higher than the base position, so the phenomenon has been subject to a movement solution and an ellipsis solution, as we will review later on.

(3b), in contrast, is an example of "R-*either*," in which *either* is in a position to the right compared to its base position in (3a). Since *either* is placed inside the first disjunct in this example, neither a movement solution nor an ellipsis solution is applicable.

(3) a.　Either John ate rice or he ate beans.

　　b.　John either ate rice or he ate beans.　(R-*either*)　　(Den Dikken (2006: 690))

In the subsequent discussion, the data are restricted to the basic L-*either* examples.

Sentences corresponding to (1b) and (1c) in Japanese are, for some speakers, possible as can be seen in (4), although they are degraded according to my intuition.[2] A sentence with a VP and an NP as disjuncts (4a), and a sentence with an NP and a clause as disjuncts (4b), are marginally acceptable, if we use a light verb or a copula.

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[2] I thank Chizuru Nakao (p.c.) for pointing out that word order matters in the judgments of (4) and (5), and providing the sentences in (4). According to her judgment, the sentences in (4) are acceptable.

(4) a. ??[Taro-ga ringo-o   Mary-ni age (ka), mikan-o   *(ka)]-no dottika-o   sita.

    T-Nom   apple-Acc Mary-to give or   orange-Acc   or-NO   either-Acc did

    'Either Taro gave Mary an apple or an orange.'

b. ??[Taro-ga ringo-o   Mary-ni ageta (ka), mikan-o   *(ka)]-no dottika   da.

    T-Nom   apple-Acc Mary-to gave   or   orange-Acc or-NO   either   Cop

    'Either Taro gave Mary an apple or an orange.'

The sentences are unacceptable if we change the word order and make the NP the first
disjunct.

(5) a. * [Ringo(-o) ka mikan-o   Taro-ga Mary-ni age (ka)]-no dottika-o   sita.

    apple-Acc   or orange-Acc T-Nom Mary-to give or-NO   either-Acc did

    'Taro gave Mary either an apple or an orange.'

b. * [Ringo(-o) ka mikan-o   Taro-ga Mary-ni ageta (ka)]-no dottika   da.

    apple-Acc   or orange-Acc T-Nom Mary-to gave or-NO   either-Acc Cop

Further, in the examples in (6), the possible positions for Japanese *dottika* 'either' are
restricted, disallowing *dottika* 'either' to move either rightwards or leftwards. In Japanese,
unbalanced disjunction is restricted, and *either*-floating is not allowed.

(6) a. Taro-ga [ringo ka   mikan]-no **dottika**-o Mary-ni ageta.

    T-Nom apple   or   orange-Lin either-Acc Mary-to gave

    'Taro gave Mary either an apple or an orange.'

b. * Taro-ga [ringo ka   mikan]-o Mary-ni ageta **dottika(**-o).

c. * Taro-ga **dottika(**-o) [ringo ka   mikan]-o Mary-ni ageta.

d. * **Dottika(**-o) Taro-ga   [ringo ka   mikan]-o Mary-ni ageta.

In Section 2.1., two previous studies on English are reviewed, namely, the ellipsis analysis and the movement analysis, which both aim to account for the floating behavior of *either*, in the course of presenting the analysis of the syntax of the English *either/or* construction and AltQs.

1.1.2.   The Size and Variety of the Disjuncts

This section introduces another data set showing that in both English and Japanese, a variety of syntactic categories and structures are allowed to serve as the disjuncts in DisjPs. Quirk et al. (1985) provide examples of the English *either/or* construction in (7) and observe that the disjuncts can be full clauses as in (7a), VPs as in (7b), or NPs as in (7c).

(7) a.   Either the room is too small or the piano is too large.

   b.   You may either stand up or sit down.

   c.   Either Sylvia or her sister will be staying with us.   (Quirk et al. (1985: 936))

Next, consider some similar Japanese examples in (8), most of which are repeated from Chapter 2. The examples indicate that a variety of syntactic categories can be the disjuncts in Japanese; NPs in (8a), TPs with a tense particle in (8b-d), VPs without a tense particle in (8e), and PPs in (8f).

(8) a.   Taro-wa [$_{\text{DisjP}}$ koohii ka kootya]-o nonda.

   T-Top   coffee or tea-Acc   drank

   'Taro drank coffee or tea.'

   b.   [$_{\text{DisjP}}$ John-ga hasitta ka Mary-ga koronda   ka] da.

      J-Nom   ran   or M-Nom fell.down or Cop

   'John ran or Mary fell down.'   (Kishimoto (2013: 16))

c. [DisjP John-ga hasiru ka Mary-ga korobu   ka] da.

   J-Nom   run   or   M-Nom   fall.down or   Cop

   'John runs/will run or Mary falls down/will fall down.'(cf. Kishimoto (2013: 20))

d. [DisjP John-ga hasiru ka Mary-ga korobu   ka] sita.

   J-Nom   run   or   M-Nom   fall.down or   did

   'John ran or Mary fell down.'

e. [DisjP John-ga hasir-i   ka Mary-ga korob-i   ka] sita.

   J-Nom   run-Con or   M-Nom   fall.down-Con or   did

   'John ran or Mary fell down.'   (Kishimoto (2013: 16))

f. Densya-ga [DisjP Tokyo eki   kara ka Shinagawa eki   kara (ka)]

   train-Nom   T   station from or S   station from or

   syuppatusuru.

   will.depart

   'The train will depart from Tokyo Station or from Shinagawa Station.'

Notably, as Kishimoto (2013) observes from examples such as (9), the Japanese *ka* cannot combine disjuncts larger than a TP.

(9) a. * [DisjP John-ga hasiru mitaida ka Mary-ga korobu   mitaida ka] da.

        J-Nom   run   seems   or   M-Nom   fall.down seems   or   Cop

        'John seems to run or Mary seems to fall down.'   (cf. Kishimoto (2013: 20))

    b. * [DisjP John-ga hasir-i   masu ka Mary-ga korob-i   masu ka] da.

        J-Nom   run-Con Pol   or   M-Nom   fall.down-Con Pol   or   Cop

        'John runs (polite) or Mary falls down (polite).'   (cf. Kishimoto (2013: 21))

A modal, which is placed to the right of the tense particle, cannot appear within the disjunct as in (9a), and a politeness marker, which is placed in the Speech Act Phrase above the CP

layer according to Miyagawa (2012), cannot appear within the disjunct either, as in (9b).[4,5]

The examples in (8) have the corresponding sentences in (10) with the optional *dottika* 'either,' similar to the English examples in (7).

(10) a.   Taro-wa   [_{DisjP} koohii ka   kootya]-no **dottika**-o   nonda.

       T-Top   coffee   or   tea-NO   either-Acc drank

       'Taro drank either coffee or tea.'

    b.   [_{DisjP} John-ga   hasitta ka   Mary-ga   koronda   ka]-no **dottika**   da.

          J-Nom   ran   or   M-Nom   fell.down or-NO either   Cop

       'Either John ran or Mary fell down.'   (Miyama (2018b: 389))

    c.   [_{DisjP} John-ga   hasir-i   ka Mary-ga   korob-i   ka]-no **dottika**-o   sita.

          J-Nom   run-Con   or M-Nom   fall.down-Con or-NO   either-Acc   did

       'Either John ran or Mary fell down.'

    d.   Densya-ga [_{DisjP} Tokyo eki   kara ka   Shinagawa eki   kara (ka)]-no

       train-Nom   T   station from or   S   station   from or-NO

       dottika-kara   syuppatusuru.

       either-from   will.depart

       'The train will depart from either Tokyo Station or Shinagawa Station.'

---

[4] As Uegaki (2018) observes, there is no problem for modals to appear outside the DisjP as in (i). The disjuncts in (i) are claimed to be TPs.

(i) a. [_{TP} [Hanako-ga   hashitta-ka] [Jiro-ga   hashitta-ka]] mitai da.

       Hanako-Nom ran-or   Jiro-Nom ran-or   seem Cop

       'It seems that Hanako ran or Jiro ran.'

   b. [_{TP} [Hanako-ga   hashitta-ka] [Jiro-ga   hashitta-ka]] daroo.

        Hanako-Nom ran-or   Jiro-Nom ran-or   may.well.be

        'It might well be that Hanako ran or Jiro ran.'   (Uegaki (2018: 7))

[5] Since, at surface form, the politeness marker appears to the left of the tense marker as in (i), Kishimoto (2013) claims that it undergoes head movement from its surface position to the Speech Act Phrase.

(i) John-ga   hasir-i   masi-ta.

   J-Nom   run-Con   Pol-Past

   'John ran (polite).'

This section has reviewed two data sets regarding the syntax of the *either/or* construction in English and Japanese: the availability of *either*-floating and the size of the disjuncts.

1.2. Semantics

As briefly introduced in Chapter 1, one semantic difference between English and Japanese is the possible interpretations of the sentences that change according to the position of *either* and *dottika* 'either.' Another difference is the form of the sentences and the possibility of AltQ/YNQ readings. The two points are reviewed in this section.

1.2.1. Possibility of the Wide Scope or Reading

Partee and Rooth (1983) and Rooth and Partee (1982) have observed that in English, when disjunction is combined with certain kinds of elements in a sentence, the sentence is (at least) three-ways ambiguous:[6]

(11)   The department is looking for a phonologist or a phonetician.

(Partee and Rooth (1983: 374))

A.   ⟦ *look for* ⟧ (⟦ *a phonologist or a phonetician* ⟧) (d)

(narrow scope *or de dicto* reading)

B.   ∃x, ⟦ *a phonologist or a phonetician* ⟧ (x), ⟦ *look for* ⟧ (x) (d)   (*de re* reading)

C.   ⟦ *look for* ⟧ (⟦ *a phonologist* ⟧) (d) ∨ ⟦ *look for* ⟧ (⟦ *a phonetician* ⟧) (d)

(wide scope *or de dicto* reading)

There is a *de re* reading in (11B) according to which there is a specific person *x*, who is

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[6] There is another possible reading for the *either/or* construction that has not been reported in previous literature, namely, the wide scope *or de re* reading. This reading is true in a situation in which the department is looking for either someone who is a phonetician or someone (possibly else) who is a phonologist, but the speaker forgot which one it was.

either a phonologist or a phonetician, and the department is looking for him/her. The narrow scope *or de dicto* reading is in (11A); under this reading, the department would be satisfied by finding either a phonologist or a phonetician. The "problematic" *de dicto* reading is described in (11C). In this reading, the department does not necessarily have a specific candidate in mind. They already have in mind which of the two types of specialist they are going to look for, but the speaker forgot which one it was. This reading becomes clearer when continued with "… but I don't know which." The overall meaning is thus as if the disjunction is connecting two propositions, taking widest scope, even though the indefinite in each disjunct takes narrow scope. This is called the "wide scope *or*" reading in Rooth and Partee (1982).

Larson (1985) observes that the possible readings of a sentence change when *either* comes into the structure. He states a generalization:

(12)   Larson's (1985) generalization (Winter (2000: 395))

 a.   In *or* coordinations without *either*, as well as in *either…or…* coordinations with *either* undisplaced, the scope of *or* is confined to those positions where *either* can potentially appear.

 b.   When *either* is displaced it specifies the scope of *or* to be at that displaced position.

(12a) assumes that the base position of *either* is next to the left edge of the DisjP. Thus, when *either* is adjacent to the DisjP all three readings are available, as in (13), whereas when *either* floats to a higher position the narrow scope *or de dicto* reading disappears, as in (14).

(13) a.   Mary is looking for a maid or a cook.

 b.   Mary is looking for either a maid or a cook.

 A.   ⟦ *look for* ⟧   (⟦ *a maid or a cook* ⟧) (m)   (narrow scope *or de dicto* reading)

B. ∃x, ⟦ *a maid or a cook* ⟧ (x), ⟦ *look for* ⟧ (x) (m)   (*de re* reading)

C. ⟦ *look for* ⟧ (⟦ *a maid* ⟧) (m) ∨ ⟦ *look for* ⟧ (⟦ *a cook* ⟧) (m)

                                                    (wide scope *or de dicto* reading)

(14) a. Mary is <u>either</u> looking for a maid or a cook.

b. Mary <u>either</u> is looking for a maid or a cook.

c. <u>Either</u> Mary is looking for a maid or a cook.

A.?*⟦ *look for* ⟧ (⟦ *a maid or a cook* ⟧) (m)   (narrow scope *or de dicto* reading)

B.? ∃x, ⟦ *a maid or a cook* ⟧ (x), ⟦ *look for* ⟧ (x) (m)   (*de re* reading)

C. ⟦ *look for* ⟧ (⟦ *a maid* ⟧) (m) ∨ ⟦ *look for* ⟧ (⟦ *a cook* ⟧) (m)

                                                    (wide scope *or de dicto* reading)

In Japanese, in contrast, there is no such variation in the interpretation that corresponds to the surface forms of the sentence, since the surface position of *dottika* 'either' is restricted, as we saw in the previous section. The sentences in (15), which are slightly modified Japanese versions of the English wide scope *or* example in Partee and Rooth (1983: 374), have a wide scope *or* reading, whether *dottika* 'either' is overt or not.

(15) a. Gengo-gakka-ga   oninron-no   kenkyuusya ka onseigaku-no

linguistics-department-Nom phonology-NO scholar   or phonetics-NO

kenkyuusya-no dottika-o   sagasiteiru.

scholar-Gen   either-Acc looking.for

'The linguistics department is looking for either a phonologist or a phonetician.'

b. Gengo-gakka-ga   oninron-no   kenkyuusya ka onseigaku-no

linguistics-department-Nom phonology-NO scholar   or phonetics-NO

kenkyuusya-o sagasiteiru.

scholar- -Acc looking.for

'The linguistics department is looking for either a phonologist or a phonetician.'

In my judgment, the sentences in (15) can be uttered in a situation where the department has decided which of the two types of specialist they are going to look for, but the speaker forgot which one it was. Further, the sentences in (15) have nominal disjuncts, but if we make the disjuncts VPs or clauses as in the sentences in (16), the sentences only have a wide scope *or* reading.[7]

(16) a. Gengo-gakka-ga   oninron-no   kenkyuusya-o sagas-i   ka

linguistics-department-Nom phonology-NO scholar-Acc   look.for-Con or

onseigaku-no   kenkyuusya-o sagas-i   ka-no   dottika(-o) siteiru.

phonetics-NO   scholar-Acc   look.for-Con or-NO   either-Acc   doing

'The linguistics department is either looking for a phonologist or a phonetician.'

b. Gengo-gakka-ga   oninron-no   kenkyuusya-o sagasiteiru   ka

linguistics-department-Nom phonology-NO scholar-Acc   looking.for   or

onseigaku-no   kenkyuusya-o sagasiteiru   ka-no   dottika   da.

phonetics-NO   scholar-Acc   looking.for   or-NO either   Cop

'Either the linguistics department is looking for a phonologist or a phonetician.'

1.2.2. *Possibility of AltQ and YNQ Readings*

The second data set showing a difference in the semantics between English and Japanese concerns AltQ and YNQ data. In English, an interrogative sentence with a DisjP without *either* is ambiguous between an AltQ and a YNQ interpretation, as in (17a). Once *either* comes in, however, an AltQ reading is no longer available and the sentence is unambiguously a YNQ regardless of the position of *either*, as depicted in (17b,c).

(17) a. Did John see a maid or a cook?   (AltQ/YNQ)

b. Did John see either a maid or a cook?   (*AltQ/YNQ)

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[7] I thank Chizuru Nakao (p.c.) for providing the data in (16).

c.   Did John either see a maid or a cook?   (*AltQ/YNQ)

In Japanese, on the other hand, we have seen in previous chapters that there is no ambiguity in the interrogative sentences. This can be seen from the contrast between (18) and (19). When there is *dotti* 'which' in the sentence, it is unambiguously an AltQ, as in (18). When there is *dottika* 'either' or neither *dotti* 'which' nor *dottika* 'either' in the sentence, it is unambiguously a YNQ, as in (19).

(18)   Taro-ga koohii ka kootya-no dotti-o   nomi-masi-ta ka? (AltQ/*YNQ)
       T-Nom   coffee   or   tea-NO   which-Acc drink-Pol-past Q
       'Which did Taro drink: coffee or tea?'

(19)   Taro-ga koohii ka kootya(-no dottika)-o nomi-masi-ta ka?   (*AltQ/YNQ)
       T-Nom   coffee   or   tea-NO   either-Acc drink-Pol-past Q
       'Did Taro drink either coffee or tea?'

In Chapter 3, it was demonstrated that a choice function analysis of *dotti* derives the interpretation of the *either/or* construction in Japanese and explains the data set in (18) and (19). It will be shown in Section 2.2. that, even though there is variation between Japanese and English in the surface form and the possible interpretations as reviewed in this section, the English data are accounted for with a choice function analysis too, in a way similar to Japanese.

2.   Proposal

This section puts forth my proposal for the syntactic structure and semantic computation of the English *either/or* and AltQ constructions, and compares English and Japanese to examine whether the proposed analyses account for the data reviewed in the previous section. Section 2.1. focuses on the syntax and Section 2.2. centers on the

semantics.

2.1. Syntax

2.1.1. The Syntax of the Either/or Construction and AltQs in English

The structure of the *either/or* construction and AltQs in English adopted here is the one in (20). *Either*, or an unpronounced *wh* operator in AltQs (adopting Romero and Han's (2003) analysis reviewed in Section 2.2.), resides in a position adjacent to the DisjP.

(20)   The structure of the *either/or* construction and AltQs in English

```
            (either)      DisjP
             wh
                    κP
                           Disj      κP
                    κ   XP   or
                         △          κ    YP
                                          △
```
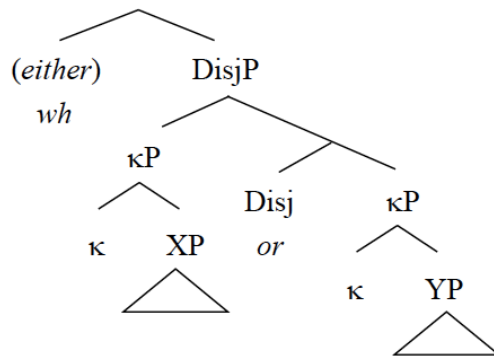
The two-layered structure of DisjP is the same as that assumed for Japanese in Chapter 2. The disjuncts in a DisjP are κPs, but the κ head is not phonetically realized in English. On the other hand, Disj, the head of the DisjP, is realized as *or* in English. The idea that there are two functional projections within DisjPs and that only one of them is phonetically realized originates from works by Jayaseelan (2014) and Mitrović and Sauerland (2016).

Section 1.1. introduced data indicating that *either* can float higher up in the sentence as in (2) and that the disjuncts can be of various syntactic sizes as in (7): clauses, VPs, or NPs.

(2) a.   John ate either rice or beans.

b.   John either ate rice or beans.

c.   Either John ate rice or beans.

(7) a.   Either the room is too small or the piano is too large.

b.   You may either stand up or sit down.

c.   Either Sylvia or her sister will be staying with us.   (Quirk et al. (1985: 936))

In surface form, the disjuncts in (2) are not of the same size. If *either* is in a position adjacent to the DisjP as in (20), the disjuncts in (2b) are *ate rice* and *beans*, a VP and an NP, and those in (2c) are *John ate rice* and *beans*, a clause and an NP.

To account for this data set, it is claimed that constituents of any syntactic category can be disjuncts in DisjPs and that *either* is base-generated in a position adjacent to the DisjP, adopting the ellipsis analysis of the *either/or* construction by Schwarz (1999) for sentences like (2b,c). Schwarz (1999) asserts that ellipsis is involved in unbalanced disjunction, in which the disjuncts do not have the same size in the surface structure as in (2b,c), and that the overt position of *either* marks the left edge of the first disjunct. The underlying forms of (2b,c) are as in (21).

(21) a.   John either ate rice or beans.

John either [$_{VP}$ ate rice] or [$_{VP}$ ~~ate~~ beans]

b.   Either John ate rice or beans

Either [$_{IP}$ John ate rice] or [$_{IP}$ ~~John ate~~ beans]   (Schwarz (1999: 351-352))

For Schwarz (1999), unbalanced disjunction is derived from balanced disjunction through ellipsis in the second disjunct. For the nature of the ellipsis operation involved in the derivation of (21), Schwarz's (1999) claim that it is Gapping is adopted.[8]

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[8] As briefly reviewed in Chapter 1, Schwarz (1999) supports his claim that the ellipsis operation is Gapping by showing that Gapping constructions and unbalanced disjunction behave in a parallel manner. However, there are some difficulties in claiming that the two constructions are identical. For one thing, Gapping usually refers to examples like (ia), in

For English AltQs too, one of the prominent analyses employs ellipsis. Based on Schwarz's (1999) ellipsis analysis, Han and Romero (2004) claim that matrix AltQs, such as (22a), are derived from the underlying structure in (22b). In (22b), the disjuncts are clauses that are turned into the surface form through ellipsis in the second disjunctive clause, and movement of the Q operator takes place.[9]

(22) a. Did John drink coffee or tea?

b. Q_i Did t_i [John drink coffee or ~~John drink~~ tea]?

Han and Romero (2004) follow Larson (1985) in that the Q operator in matrix AltQs and *whether* in embedded AltQs are *wh*-phrases and have to undergo *wh*-movement. A piece of evidence they provide to support their claim is the fact that an AltQ becomes unacceptable if the hypothesized *wh*-movement crosses an island. This is shown in the unacceptable

which two elements are overt in the second conjunct, while examples like (ib), in which only one element is overt, are generally considered to have undergone stripping. Researchers do not agree on whether the two constructions have the same source, although the two phenomena share a common point that they only occur in coordination structures.
(i) a. Jones likes seafood and Smith, bread.
    b. Jones likes seafood a lot, and bread too.   (Johnson (2019: 562))
Stripping is often claimed to be derived through focus movement of the item that remains overt (*bread* in (ib)) and deleting the remnant, as in (ii).
(ii)   Jones [FocP [VP likes seafood a lot] and [FocP bread$_1$ [VP ~~likes t_1 a lot~~]]
                                                        (cf. Johnson (2019: 571))
    For another, there are Gapping examples like (iii), which indicate that the subject in the first conjunct binds elements in the second conjunct. This behavior contrasts with that of sentences with normal conjunction, as in (iv).
(iii)   No boy$_1$ joined the navy and his$_1$ mother, the army.
(iv) * No boy$_1$ joined the navy and his$_1$ mother joined the army.   (Johnson (2006: 429))
Johnson (2019: 582) suggests that two vPs are coordinated in sentences like (iii), and the subject in the first conjunct (*no boy* in (iii)) is raised to the SpecTP position, while the subject in the second conjunct (*his mother* in (iii)) remains in SpecvP, so it is c-commanded by the subject in the first conjunct. The contrast between (iii) and (iv) leads us to doubt whether the clausal disjunction in the *either/or* construction is identical to constructions that allow Gapping, but detailed investigations are left for future research. I thank Chizuru Nakao (p.c.) for pointing out the problems related to Gapping.
[9] In Section 2.2., where we turn to the semantics of the English *either/or* construction and AltQs, I follow Romero and Han's (2003) analysis for AltQs, which assigns the moved *wh* operator the semantic role of introducing a choice function variable.

example in (23a), which is claimed to have the structure in (23b).

(23) a. * Did John believe the claim that Bill resigned or retired?

b. * Q_i Did John believe [the claim that Bill t_i [resigned or retired]]?

Han and Romero's (2004) claim that in AltQs, *whether* or the covert operator that corresponds to it undergoes *wh* movement, and ellipsis also takes place in the second disjunct, is adopted here.
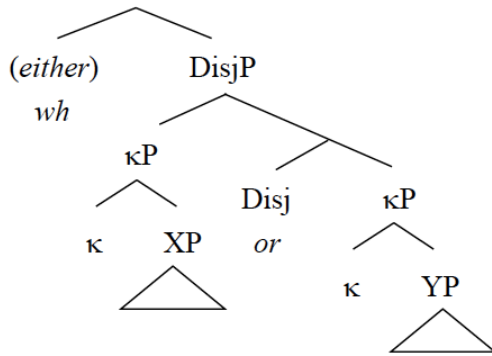
In the next section, the syntax of English and Japanese is compared in more detail. First, it is pointed out that Japanese can have a more complicated disjunction structure than English, and this difference emerges from a difference in the syntactic property of the lexical items *dottika/dotti* 'either/which' and *either*. Then, it is demonstrated that another difference between the two languages is that ellipsis accounts for the *either*-floating data and unbalanced disjunction data in English, whereas ellipsis only accounts for the unbalanced disjunction data of the Japanese constructions. Then, it is shown that *either* and *dottika* 'either' do not undergo syntactic movement in English or Japanese, as opposed to the movement analysis of the English *either/or* construction by Larson (1985).

2.1.2. *Comparison between English and Japanese*

2.1.2.1. *The Structure of Disjunction*

Consider the English structure repeated in (24) and the Japanese structure repeated from Chapter 2 in (25).

(24)   The structure of the *either/or* construction and AltQs in English

```
        ┌────────┐
(either)    DisjP
  wh      ┌──────┐
       κP      ┌────┐
     ┌───┐   Disj   κP
     κ   XP   or   ┌───┐
        /△\       κ   YP
                     /△\
```

(25)   The structure of the *either/or* construction in Japanese

```
                    DP_Part
                 ┌──────────┐
              FP              ┌────────┐
           ┌─────┐          QP        D
        DP_Whole  F       ┌────┐
      ┌────────┐         #P          ┌────────┐
   DisjP      ┌────┐   ┌────┐      CaseP     Q
  /△\        QP   D   dottika    ┌─────┐
koohii ka kootya  ┌────┐    1    NP
              CaseP    Q       ┌───┐
            ┌─────┐          t_NP  # nomimono  t_#P  Case
          NP      ┌────┐        tu                    -o
    nomimono #P   Case
           /△\    -no
        2  t_NP  tu
```
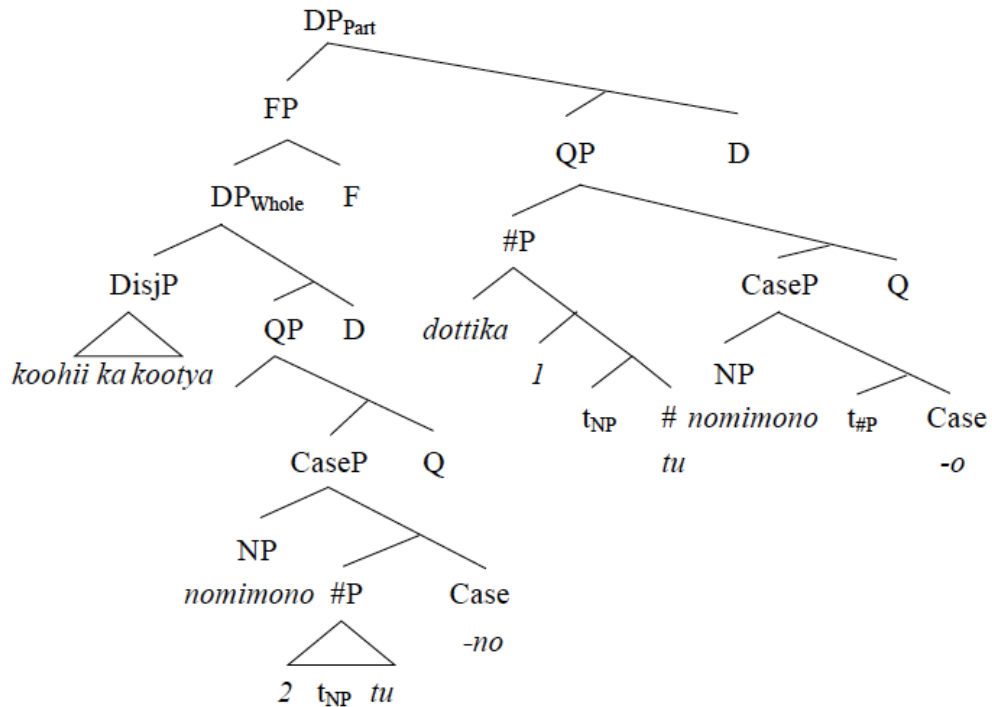
Additionally, recall that the omitted structure inside the DisjP in the Japanese example (25) is assumed to be the same as that in the English example, except for the order of the head in the κPs, as in (26). In Japanese, the κ head is phonetically realized as *ka*, while the Disj head is not realized.

(26)   The structure of the DisjP in Japanese
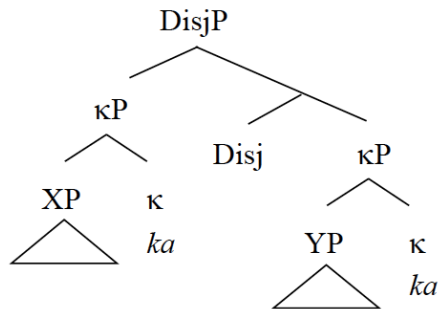
Comparing the English and Japanese structures, there are several common points between them: Constituents of any syntactic category can be disjuncts in DisjPs (which reflects the data introduced in Section 1.1.2.), and *either*, the *wh* operator, and *dottika/dotti* 'either/which' are base-generated in a position adjacent to the DisjP.[10] One difference observed between the two languages is that the structure of Japanese is much more complex than that of English. There is some structure in addition to the DisjP in Japanese, while the English structure only has *either* or the *wh* operator, in addition to the DisjP.

It is claimed that this difference stems from the difference in the syntactic category of *either* and *dottika* 'either.' According to the proposal in Chapter 2, *dottika* 'either' projects a DP, making it possible for a numeral, a classifier, and a noun to be used with *dottika* 'either.' Since the DisjP is in another DP, even though the Japanese *either/or* construction seems to have a simple structure of a DisjP and *dottika* 'either,' the underlying structure is more complex, as in (25), with two DPs and an FP. In contrast, English *either* is a quantifier

---

[10] While it has been asserted that the Japanese *either/or* and AltQ constructions are a kind of partitive, it is not evident whether the same claim can be made for the English constructions as well. English has forms like (i) using *of*, which resemble partitives.
(i) a. Bill will meet either of Jane {*and / or} Jacky.
    b. Bill will meet one of Jane, Jill, {*and / or} Jacky.
                                    (cf. de Hoop (1997: 156), Ionin et al. (2006: 366))
    c. Which of Jane {*and / or} Jacky did Bill meet?
In the English examples, however, only *or* can be used as the coordinator, and it is difficult to add a numeral or an NP to *either* or the DisjP (except for *either one*), unlike the Japanese examples. Here I do not explore the possibility of the English structure having a complex structure similar to that of Japanese.

(or an adverbial), as Den Dikken (2006) suggests. *Either* resides in a position adjacent to the DisjP as its base position, without any other item accompanying it, as in (24).

This difference in the syntactic category of *either* and *dottika* 'either' is related not only to the disjunction structure in English and Japanese, but also to the availability of an ellipsis operation inside the disjuncts, as discussed in the next section.

2.1.2.2. Ellipsis

In Section 2.1.1., the ellipsis analysis was adopted for both the *either/or* construction and AltQs in English. According to the analysis, the *either/or* construction examples in the first line of (21a,b) have disjuncts of the same syntactic size in their underlying form, as in the second line of (21a,b). Matrix AltQs, such as (22a), similarly have the underlying structure in (22b), with disjuncts of the same syntactic size. All examples are derived via ellipsis inside the second disjunct.

(21) a.   John either ate rice or beans.

John either [$_{VP}$ ate rice] or [$_{VP}$ ~~ate~~ beans]

b.   Either John ate rice or beans

Either [$_{IP}$ John ate rice] or [$_{IP}$ ~~John ate~~ beans]   (Schwarz (1999: 351-352))

(22) a.   Did John drink coffee or tea?

b.   *Q$_i$*   Did   *t$_i$*   [John drink coffee or ~~John drink~~ tea]?

However, in Japanese, an ellipsis treatment is only possible for the unbalanced disjunction data, repeated below.

(4) a. ??[Taro-ga   ringo-o   Mary-ni   age (ka), mikan-o   *(ka)]-no   dottika-o   sita.

T-Nom   apple-Acc Mary-to   give   or   orange-Acc   or-NO   either-Acc   did

'Either Taro gave Mary an apple or an orange.'

b. ??[Taro-ga ringo-o   Mary-ni ageta (ka), mikan-o   *(ka)]-no dottika   da.

　　 T-Nom   apple-Acc Mary-to gave or   orange-Acc or-NO   either   Cop

　　 'Either Taro gave Mary an apple or an orange.'

For example, (27) is the underlying form of (4a), based on the ellipsis analysis. Assuming that the ellipsis operation is stripping, in which an element undergoes focus movement and the remnant is elided (cf. Johnson (2019)), (4a) is derived from two VP-disjunctives in the DisjP, and all elements except for *mikan-o* 'orange-Acc' have undergone ellipsis in the second VP.

(27)　　Structure of (4a)
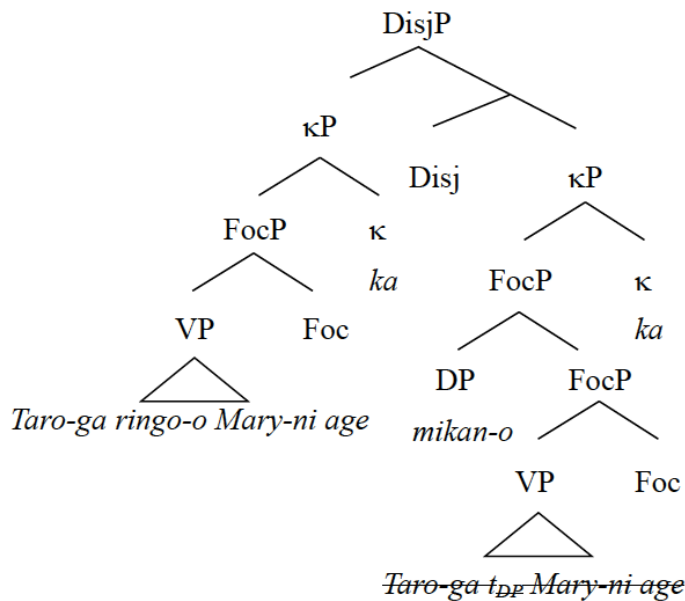
As observed in Section 1.1.2., however, the disjuncts in Japanese cannot be larger than a TP. This might be the reason why the sentences in (4) are marginal, and are unacceptable for many speakers.

　　The claim that the sentences in (4) are derived from VP- or clausal-disjunctives is supported by the fact that the second *ka* is obligatory. One characteristic of sentences with VP- or clausal-disjunctives is that the second *ka* 'or' cannot be dropped, as exemplified in

(28).

(28) a. [John-ga hasir-i   ka] [Mary-ga korob-i   *(ka)] sita.

        J-Nom   run-Con or M-Nom   fall.down-Con or   did

        'Either John ran or Mary fell down.'

    b. [John-ga hasitta ka] [Mary-ga koronda *(ka)] da.

        J-Nom   ran   or M-Nom   fell.down or   Cop

        'Either John ran or Mary fell down.'   (Miyama (2018b: 390))

Since we cannot drop the second *ka* in the sentences in (4), it is plausible that the source

of the sentences is disjunction with VPs or clauses as disjuncts. The sentences in (5) further

justify the idea that ellipsis is involved in the derivation of (4), since they show that the

sentences are unacceptable if ellipsis takes place backward.[12]

(5) a. * [Ringo(-o) ka Taro-ga mikan-o   Mary-ni age (ka)]-no dottika-o   sita.

         apple-Acc or T-Nom orange-Acc Mary-to give or-NO   either-Acc did

         'Taro gave Mary either an apple or an orange.'

    b. * [Ringo(-o) ka Taro-ga mikan-o   Mary-ni ageta (ka)]-no dottika   da.

         apple-Acc or T-Nom orange-Acc Mary-to gave or-NO   either-Acc Cop

    In contrast, there is little evidence to claim that ellipsis is involved in the derivation of

---

[12] A problem left for future research is what precisely this ellipsis operation is. If we extend
Schwarz's (1999) analysis, Gapping also takes place in Japanese, but the direction of the
ellipsis operation in (4) differs from that of Gapping. As we can observe from (5) and the
Gapping example in (i), Gapping takes place backward in Japanese, but the ellipsis under
consideration here takes place forward.
(i) Watakusi-wa sakana-o ~~tabe~~, Biru-wa gohan-o tabeta.
    I-Top   fish-Acc eat B-Top   rice-Top ate
    'I ate fish, and Bill ate rice.'   (Ross (1970: 251))
I thank Shoichi Takahashi (p.c.) for drawing my attention to the problem of the direction
of ellipsis.

Japanese nominal disjunctive examples in (29). That is, normal ellipsis operations cannot derive sentences with nominal disjuncts, such as (29), from the corresponding sentences with clausal disjuncts in (30).

(29)   Taro-ga   [koohii ka kootya (?ka)](-no dottika)-o   nonda.
       Taro-Nom coffee   or   tea   or-NO   either-Acc drank
       'Taro drank either coffee or tea.'

(30)   Taro-ga koohii-o   nonda ka Taro-ga kootya-o nonda ka(-no dottika) da.
       T-Nom   coffee-Acc drank or T-Nom tea-Acc   drank or-NO either   Cop
       'Either Taro drank coffee or Taro drank tea.'

One reason to claim that nominal disjunction does not involve ellipsis comes from the fact, introduced earlier in this section, that nominal disjunction does not allow *either*-floating.

(6) a. Taro-ga [ringo ka mikan]-no **dottika**-o Mary-ni ageta.
        T-Nom apple or orange-Lin either-Acc Mary-to   gave
        'Taro gave Mary either an apple or an orange.'

   b. * Taro-ga [ringo ka mikan]-o Mary-ni ageta **dottika(**-o).

   c. * Taro-ga **dottika(**-o) [ringo ka mikan]-o Mary-ni ageta.

   d. * **Dottika(**-o) Taro-ga [ringo ka mikan]-o Mary-ni ageta.

Since the central aim of the ellipsis analysis is to explain the English unbalanced disjunction and *either*-floating data, there is no motivation to claim that ellipsis is involved in these examples in the first place.

Another reason to assert that Japanese nominal disjunctive examples are not derived from clausal disjunctives is because ellipsis cannot derive the surface form of nominal

disjunctive examples. First, the sentence that would underlie (29) according to the ellipsis analysis is unacceptable, as shown in (31). From (31), the verb in the disjuncts has to undergo ellipsis to derive (29), but the underlying form (31) is unacceptable.[13] Because what should underlie a nominal disjunctive example is not an acceptable sentence, it becomes less probable that it is derived from this sentence.

(31) * [Taro-ga koohii-o   nonda ka Taro-ga kootya-o nonda ka](-no dottika)-o

       T-Nom   coffee-Acc drank   or T-Nom   tea-Acc   drank   or-NO   either-Acc

       nonda.

       drank

       (intended) 'Either Taro drank coffee or Taro drank tea.'

Further, the optionality of the second *ka* 'or' in (29) indicates that the sentence is not derived from (30). As seen earlier in (28), the second *ka* 'or' in clausal disjunctives is obligatory. There is no reason for the property of the second *ka* 'or' to change in the course of deriving (29) from (30). The second *ka* 'or,' however, is optional in (29), implying that (29) and (30) have different sources.

Some might claim that nominal disjunctive examples like (29) are derived from a sentence with VP-disjunctives via Gapping like the English *either/or* construction example in (32a) or the Japanese example in (32b). (In Japanese, the verb in the first clause is elided since Japanese is a head-final language.)

(32) a. John either [$_{VP}$ ate rice] or [$_{VP}$ ~~ate~~ beans]

---

[13] The unacceptability does not arise from the repeated material in the disjuncts, but from the repeated matrix predicate *nonda* 'drank.' To make the sentence acceptable, the matrix clause has to be *dottika da* 'either Cop,' as in other examples with clausal disjuncts.

b. Watakusi-wa sakana-o ~~tabe~~, Biru-wa   gohan-o tabeta.

I-Top   fish-Acc eat B-Top   rice-Top ate

'I ate fish, and Bill ate rice.'   (Ross (1970: 251))

Nonetheless, this is not what is happening in (29), because even if we elide the verb in the

first VP as in (33), we still do not get the desired form.

(33) ?? Taro-ga [koohii-o ~~nom-i~~   ka][kootya-o nom-i   ka] sita.

T-Nom coffee-Acc drink-Con or tea-Acc   drink-Con or did

(intended) 'Taro drank coffee or tea.'

Deriving (29) from a sentence with two VP-disjunctives through Right Node Raising,

which is in operation in (34), is not possible either. (35) shows that Right Node Raising

still does not give us the form in (29). The case marker is not in the position we want it to

be, left inside the DisjP, and even though the sentence in (35) is not completely out, we do

not have a way to turn it into (29).[14,15]

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[14] I thank Kyle Johnson for bringing the point to my attention.

[15] Nakao Chizuru (p.c.) points out that the case marker or the Postposition in the first
coordinand can be dropped in the Right Node Raising example in (i).

(i)   John-ga Bill-~~nituite~~ t_1, sosite Mary-ga Susan-nituite t_1 hanasita$_1$.
        J-Nom   B-about,   and   M-Nom S-about   talked
        'John talked about Bill and Mary about Susan.'

If the same deletion takes place in (35), the result is in (ii), which is the desired form.

(ii)   Taro-ga [koohii-~~o~~ ~~nom-i~~   ka][kootya-~~o~~ ~~nom-i~~   ka](-no dottika-o)
        T-Nom coffee-Acc drink-Con or tea-Acc   drink-Con or-NO   either-Acc
        nonda.
        drank
        'Taro drank either coffee or tea.'

I currently have no means to block this derivation, but as Nakao Chizuru (p.c.) suggests, it
might be blocked from the constraint on the elided material that it has to be in the right
edge of the disjunct, which Uegaki (2014b) claims. See note 16 on the details of this
constraint.

(34)　　John-ga　Bill-nituite　t₁, sosite　Mary-ga　Susan-nituite　t₁　hanasita₁.

　　　　J-Nom　B-about,　　and　　M-Nom　S-about　　　　talked

　　　　'John talked about Bill and Mary about Susan.'

(35) ?? Taro-ga [koohii-o　nom-i　ka][kootya-o　nom-i　ka](-no dottika-o)

　　　　T-Nom　coffee-Acc drink-Con or　tea-Acc　drink-Con or-NO　either-Acc

　　　　nonda.

　　　　drank

　　　　(intended) 'Taro drank either coffee or tea.'

　　In sum, we have first seen that ellipsis takes place in the derivation of unbalanced disjunction in Japanese. Nevertheless, it is concluded that we must treat sentences with clausal disjuncts and those with nominal disjuncts as having different sources and that the derivation of nominal disjuncts in Japanese does not involve ellipsis.[16]

　　In this section, it has been shown that the *either*-floating examples in English in (1b,c) have an underlying structure in (36a,b), and undergo ellipsis to obtain the surface form. Thus, although the disjuncts may seem to be unbalanced in size at first glance, (1b,c) have VP-disjunctives and clausal-disjunctives in their underlying forms. In contrast, Japanese nominal disjunctive examples, such as (10a), do not involve ellipsis in their derivation; hence, the structure is the same as the surface form. The disjuncts are nominals in (10a)

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[16] Uegaki (2014b) also claims that examples with nominal disjuncts like (ia) (which is a YNQ) are not derived from sentences with two clauses as disjuncts. That is, the underlying structure is not like the one in (ib).
(i) a. [Taro-ga [koohii ka otya]-o nonda ka](-ga mondai　da).
　　　　T-Nom　coffee or tea-Acc drank　Q-Nom question Cop
　　　　'(It is a question) whether Taro drank coffee or tea.'　　(Uegaki (2014b: 257))
　　b.*[Taro-wa koohii-o　nonda ka], [Taro-wa otya-o　nonda ka]
　　　　T-Top　coffee-Acc drank or　T-Top　tea-Acc drank or(Uegaki (2014b: 258))
The reason he gives for this restriction on ellipsis is that the elided material has to be at the right edge of the disjunct, as in the conjunction example in (ii).
(ii)a. [Taro-ga doko-e　itta　ka], sosite [Taro-wa　dare-to　itta　ka]
　　　　T-Nom　where-to went Q　and　T-Top　who-with　went Q
　　b. *[Taro-ga doko-e　itta ka], sosite [Taro-wa　dare-to　itta ka]
　　　　'Where Taro went and with whom he went'　　　　(Uegaki (2014b: 258))

and clauses in (10b).

(36) a.   Taro **either** gave Mary an apple or ~~gave Mary~~ an orange. (= (1b))

    b.   **Either** Taro gave Mary an apple or ~~Taro gave Mary~~ an orange. (= (1c))

(10) a.   Taro-wa   [_{DisjP} koohii ka kootya]-no dottika-o   nonda.

       T-Top   coffee or tea-NO   either-Acc drank

       'Taro drank either coffee or tea.'

    b.   [_{DisjP} John-ga hasitta ka Mary-ga koronda   ka]-no dottika   da.

          J-Nom   ran   or M-Nom fell.down or-NO either   Cop

       'Either John ran or Mary fell down.'   (Miyama (2018b:389))

This difference between the two languages regarding how much ellipsis is allowed is related to the difference in the syntactic category of *either* and *dottika* 'either' that we saw earlier. *Dottika* 'either' is a DP that determines the category of the DisjP + *dottika* 'either.' As such, the position of *dottika* 'either' is fixed. On the other hand, *either* is a quantifier (or an adverbial) that can appear anywhere in the sentence, as Den Dikken (2006) suggests.

2.1.2.3.   *Movement of* Either *and* Dottika

    In this section, we review another analysis of the English *either/or* construction and AltQs, namely, the movement analysis, and examine whether it can account for English and Japanese data. As briefly reviewed in Chapter 1, Larson (1985) proposes a movement analysis for the wide scope *or* data. He presents data that show both *either* and *whether* marking the scope of *or* in the *either/or* construction and in embedded AltQs. Data in (37) and (38), introduced in Section 1.2.1., are characterized by Larson (1985) as *either* marking the scope of *or* (when *either* is absent, a null operator is used in the position of *either*).
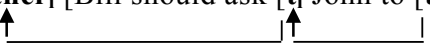
(37)   Mary is looking for (either) [_{DisjP} a maid or a cook].

a. Mary is looking for x, x a maid or a cook. (narrow scope *or* reading)

b. Mary is looking for a maid or Mary is looking for a cook. (wide scope *or* reading)

(38)   Mary is either looking for a maid or a cook.

Mary either is looking for a maid or a cook.

Either Mary is looking for a maid or a cook.

a. * Mary is looking for x, x a maid or a cook.

b. Mary is looking for a maid or Mary is looking for a cook.

According to Larson (1985), *whether* also exhibits a scope-marking behavior similar to that of *either*. For (39), in addition to the reading in (39a) which corresponds to the one in which *whether* is replaced with *whether or not*, there is a reading in which disjunction takes scope at the intermediate clause level (39b). *Whether* marks the scope position of *or* in (39b).

(39)   I know whether [Bill should ask [John to resign or retire]]. (Larson (1985: 226))

a.   {p: p is true & [[p = Bill should ask John to resign or retire]

$\vee$ [p = ¬Bill should ask John to resign or retire]]}

b.   {p: p is true & [[p = Bill should ask John to resign]

$\vee$ [p = Bill should ask John to retire]]}

To account for the data in (38) and (39), Larson (1985) proposes a movement analysis of *either*/Op/*whether* in (40).

(40) a.   **Either$_i$/Op** Mary **either$_i$/Op** is **either$_i$/Op** looking for [$_{XP}$ **t$_i$** a maid or a cook].

b.   I know [**whether$_i$** [Bill should ask [**t$_i$** John to [**t$_i$** resign or retire]]]]

Either and Op undergo overt syntactic movement from a position adjacent to the disjuncts,

and mark the scope position of *or* as in (40a). *Whether*, a *wh*-item, undergoes successive-cyclic movement from its base position, adjacent to the disjuncts, to its surface position, where it marks the scope position of *or* as in (40b).

However, data such as (41a,b) cast doubt on the validity of the movement analysis of *either*. (41a,b) have both of the readings in (41A) and (41B).

(41) a. If Bill praises <u>either</u> Mary or Sue then John will be happy. (^{OK}NS/^{OK}WS)

    b. If Bill <u>either</u> praises Mary or Sue then John will be happy. (^{OK}NS/^{OK}WS)

    A. If Bill praises Mary then John will be happy and if Bill praises Sue then John will be happy.   (Narrow Scope)

    B. If Bill praises Mary then John will be happy or if Bill praises Sue then John will be happy.   (Wide Scope)   (Winter (2000: 403))

According to Larson (1985), the possible scope position of *or* is marked by the movement of *either*. Note, however, that *either* cannot be in a position outside the *if* clause as in (42). This is natural if *either* undergoes syntactic movement and the *if* clause is an island, but it means that the wide scope *or* reading of (41a,b) is not predicted by the movement analysis.

(42) * Either if Bill praises Mary or Sue then John will be happy. (Winter (2000: 403))

Thus, although a movement analysis of *whether* or a covert operator that corresponds to it in AltQs is adopted, as discussed in Section 2.1.1., the analysis cannot be extended to *either*.

Extending the movement analysis to Japanese is also problematic. This is because, as seen earlier in Section 1.1.1., Japanese does not allow the standard pattern corresponding to (38), in which *dottika* 'either' floats away from its base position, but the sentence has a wide scope *or* reading. For example, the Japanese examples in (15) show that *dottika* 'either' cannot move rightwards or leftwards, indicating that *dottika* 'either' does not "float" to

some position like Larson (1985) claims for *either*. Since the movement analysis primarily aims to explain data in which the scope position of *or* matches the position where *either* (potentially) appears, given that *dottika* 'either' cannot be in a position marking the scope of the wide scope *or*, there is no motivation to extend the movement analysis to Japanese.

(15) a. Gengo-gakka-ga   [oninron-no   kenkyuusya ka onseigaku-no
          linguistics-department-Nom phonology-NO   scholar   or   phonetics-NO
          kenkyuusya]-no **dottika**-o   sagasiteiru.
          scholar-Gen   either-Acc   looking.for
          'The linguistics department is looking for either a phonologist or a phonetician.'

   b. * Gengo-gakka-ga [onseigaku-no kenkyuusya ka   oninron-no kenkyuusya]-o
          sagasiteiru   **dottika(**-o).

   c. * Gengo-gakka-ga **dottika(**-o) [onseigaku-no kenkyuusya ka   oninron-no
          kenkyuusya]-o   sagasiteiru.

   d. * **Dottika(**-o) gengo-gakka-ga [onseigaku-no kenkyuusya ka   oninron-no
          kenkyuusya]-o   sagasiteiru.

Further, the acceptable sentence in (15a) has a wide scope *or* reading, appropriate when the department has decided which of the two types of specialist they are going to look for, but the speaker forgot which one it was. The movement analysis predicts that a wide scope *or* reading should not be possible, because *dottika* 'either' cannot overtly appear in a position marking that scope. Since the movement analysis makes an empirically false prediction, it cannot be extended to Japanese.

In this section, the syntax of English in comparison to Japanese, and how the syntactic differences between the two languages can be accounted for, have been discussed. The syntactic structure claimed for the English *either/or* and AltQ constructions is essentially the same as that of the Japanese constructions: Constituents of any syntactic category can

be disjuncts in DisjPs, and *either* and *dottika/dotti* 'either/which' are base-generated in a position adjacent to the DisjP. The differences between the two languages, namely, the possibility/impossibility of unbalanced disjunction and *either*-floating, originate from the difference in the syntactic category of *either* and *dottika/dotti* 'either/which,' as well as how much ellipsis is allowed within the disjuncts. In English, *either* is an adverbial item that can appear in multiple positions of the sentence, and ellipsis in the second disjunct can take place in many examples, resulting in unbalanced disjunction. In Japanese, in contrast, *dottika/dotti* 'either/which' project a DP, and moving the items is restricted. Further, the ellipsis analysis explains (the very few) unbalanced disjunction data, but it has been concluded that ellipsis is not involved in the derivation of the nominal disjunctive examples.

In the next section, the semantics of the *either/or* construction and AltQs in English will be explored in detail. The aim is to account for the availability of the wide scope *or* reading and the distribution of AltQ/YNQ readings, introduced in Section 1.2. The English data are accounted for by adopting the syntactic analysis proposed in this section, and in addition to that, a choice function analysis of *either*. Interestingly, *either* introduces a choice function variable, just as *dotti* and *ka* do in Japanese, according to the proposal made in Chapter 3.

2.2.   *Semantics*

2.2.1.   *A Choice Function Analysis*

My proposal is that *either* introduces a choice function variable and *or* forms a set of disjuncts that serves as its argument. The position from which the choice function variable is bound by Existential Closure becomes the scope position of *or*. The idea that *or* forms a set of its disjuncts is based on the claim of Alonso-Ovalle (2006), introduced in Chapter 1. This analysis, combined with the ellipsis analysis proposed in Section 2.1., can capture the wide scope *or* facts in (13) and (14), repeated below in (43) and (44). We start by informally examining how the analysis explains the data.

In sentences without *either* or with *either* in the base position (43), where there is an ambiguity between narrow scope and wide scope *or*, no ellipsis is involved in the derivation of "balanced disjunction." Thus, there are multiple possible positions for Existential Closure that correspond to the multiple possible scope positions of *or*. It is assumed here that in (43a), a covert version of *either* exists in the sentence.

(43) **Ambiguous between NS and WS *or***

    a. Mary is looking for a maid or a cook.

    b. Mary is looking for <u>either</u> a maid or a cook.

=> **No ellipsis/Multiple possible positions of Existential Closure**

    [∃f] Mary is looking for [∃f] PRO to FIND f({a maid, a cook})

<div align="right">(cf. Den Dikken et al. (2018))</div>

In sentences with floated *either* in (44), where the wide scope *or* reading is forced, unbalanced disjunction is derived via ellipsis.

(44) **Unambiguous: only WS *or***

    a. Mary is <u>either</u> looking for a maid or a cook.

    b. Mary <u>either</u> is looking for a maid or a cook.

    c. <u>Either</u> Mary is looking for a maid or a cook.

=> **Involve ellipsis/Existential Closure possible only above DisjP**

    a. Mary is <u>either</u> looking for a maid or ~~looking for~~ a cook.

        ∃f. Mary is f({looking for a maid, looking for a cook})

    b. Mary <u>either</u> is looking for a maid or ~~is looking for~~ a cook.

        ∃f. Mary f({is looking for a maid, is looking for a cook})

    c. <u>Either</u> Mary is looking for a maid or ~~Mary is looking for~~ a cook.

        ∃f. f({Mary is looking for a maid, Mary is looking for a cook})

Since the choice function variable is introduced by *either* adjacent to the DisjP, Existential Closure is restricted to a position above the DisjP. With this analysis, we can account for the fact that only the wide scope *or* reading is available in the sentences.

In this analysis, we assign *either* the semantic work of introducing the choice function variable, and the lexical entry of *either* is in (45). To make this work formally, this is analyzed as involving a covert operator coindexed with *either*, whose sole semantic work is to modify the assignment function g so that it assigns to its index a choice function variable f_i, as in (46).[19]

(45) $[\![$ *either*$_i$ $]\!]^{w,g} = g(i)$

(46) $[\![$ Op$_i$[*either*$_i$ DisjP] $]\!]^{w,g} = [\![$ *either*$_i$ DisjP $]\!]^{w,\, g[i \to fi]}$

                where $f_i \in D_{Chf}$ is a choice function $Chf(f_i)$ iff for all P in $dom(f_i)$: $f_i(P) \in P$

The narrow scope *or* reading of the sentence with *either* in its base position is derived as in (47) and the wide scope *or* reading of the sentence with *either*-floating is derived as in (48).

(47) a.   Mary is looking for [$_{TP1}$ PRO TO FIND [$_{XP}$ Op$_i$ either$_i$ [$_{DisjP}$ a maid or a cook]]].

     b. $[\![$ XP $]\!]^{w,g} = [\![$ *either*$_i$ DisjP $]\!]^{w,g[i \to fi]}$: $f_i \in D_{Chf}$

              $= [\![$ *either*$_i$ $]\!]^{w,g[i \to fi]} ([\![$ DisjP $]\!]^{w,g[i \to fi]})$: $f_i \in D_{Chf}$

              $= f_i (\{$a maid in w, a cook in w$\})$: $f_i \in D_{Chf}$

     c. $[\![$ TP $]\!]^{w,g} = \lambda w. \exists f_i.$ Chf (f_i) & Mary to find $f_i (\{$a maid in w, a cook in w$\})$ in w

     d. $[\![(47a)]\!]^{w,g} = \lambda w'.$ Mary is looking for [$\lambda w. \exists f_i.$ Chf(f_i) & Mary to find $f_i (\{$a maid

                                      in w, a cook in w$\})$ in w] in w'

---

[19] It is assumed that the covert operator is always interpreted together with *either* and does not have an independent semantic denotation, its own ordinary semantic value or focus semantic value.

(48) a. Mary is [$_{XP}$ Op$_i$ either$_i$ [$_{DisjP}$ looking for PRO TO FIND a maid or ~~looking for PRO~~

~~TO FIND~~ a cook]].

b. [[XP]]^{w,g} = [[$either_i$ DisjP]]$^{w,g[i \to fi]}$: f$_i$ ∈ D$_{Chf}$

= [[$either_i$]]$^{w,g[i \to fi]}$ ([[DisjP]]$^{w,g[i \to fi]}$) : f$_i$ ∈ D$_{Chf}$

= f$_i$ ({λw′. λx. x is looking for [λw. Mary to find a maid in w] in w′,

λw′. λx. x is looking for [λw. Mary to find a cook in w] in w′}) :

f$_i$ ∈D$_{Chf}$

c. [[(48a)]] = λw″. ∃f$_i$. Chf (f$_i$) & f$_i$ ({λw′. λx. x is looking for [λw. Mary to find a

maid in w] in w′, λw′. λx. x is looking for [λw. Mary to find a cook in

w] in w′}) (w″)(Mary)

The first set of data, namely, the wide scope *or* data, is accounted for by the proposed

analysis.

The analysis also accounts for the data set in (41), which was problematic for the

movement analysis. This is because Existential Closure is not restricted by islands, and

ellipsis that takes place inside the *if*-clause in (41b) should not cause any problem.[20]

(41) a. If Bill praises <u>either</u> Mary or Sue then John will be happy. (^{OK}NS/^{OK}WS)

b. If Bill <u>either</u> praises Mary or Sue then John will be happy. (^{OK}NS/^{OK}WS)

A. If Bill praises Mary then John will be happy and if Bill praises Sue then John will

be happy.   (Narrow Scope)

B. If Bill praises Mary then John will be happy or if Bill praises Sue then John will

be happy.   (Wide Scope)   (Winter (2000: 403))

---

[20] The data in (42) repeated below, however, is not explained by the present proposal, since there is no reason for the sentence to become unacceptable according to the analysis. This problem is left for future research.
(42) * Either if Bill praises Mary or Sue then John will be happy.   (Winter (2000: 403))

The present proposal also explains the AltQ/YNQ data, repeated in (49), on the assumption that the question (Q) operator, existing in the CP level in interrogatives, has a different denotation in AltQs and YNQs.

(49) a. Did John see a maid or a cook?　　　(AltQ/YNQ)

　　 b. Did John see either a maid or a cook?　(*AltQ/YNQ)

　　 c. Did John either see a maid or a cook?　(*AltQ/YNQ)

For AltQs, Romero and Han's (2003) *wh* operator, which moves to take the CP scope and leaves its restrictor in situ, is adopted.

　　Romero and Han (2003) claim that there is a *wh* operator (and/or the Q morpheme in C) that moves to the CP domain and takes the CP scope, while its trace is interpreted as a choice function variable. The AltQ (50a) has the LF representation in (50b).

(50) a. Did John drink coffee or tea?

　　 b. [$_{CP}$ wh i [$_{C'}$ Q [$_{IP}$ John drank [t_i coffee or tea]]]]　　(Romero and Han (2003: 15))

Romero and Han (2003) posit that the Q operator and the *wh* operator in AltQs have the denotations in (51). The *wh* operator, combined with the index, performs the work of rewriting the assignment function. Combining this analysis with that of Han and Romero (2004), the *wh* operator is assumed to be the covert version of *whether*.[28]

(51) a. $[\![Q]\!] = \lambda q_{st}.\ \lambda w.\ \lambda p_{st}.\ p = q$

　　 b. $[\![wh]\!]^{w,g} = \lambda R_{<Chf,\ <s,\ <st,\ t>>>}\lambda w.\ \lambda p.\ [\exists f_i.\ Chf(f_i)\ \&\ R(f_i)(w)(p)]$, where $f_i \in D_{Chf}$

---

[28] I take the Q operator and *whether* in Han and Romero (2004) as corresponding to the *wh* operator in Romoro and Han (2003).

The computation of (50b) proceeds as in (52) in the notation adopted here. DisjP denotes the set of the disjunct denotations, and the trace of the *wh* operator introduces a choice function variable that takes that set as its argument.[29]

(52) a. $[\![t_i \text{ } coffee \text{ } or \text{ } tea]\!]^{g[i \rightarrow fi]} = f_i (\{\text{coffee, tea}\})$

b. $[\![IP]\!]^{w,g[i \rightarrow fi]} = \lambda w'. \text{ John drank } f_i (\{\text{coffee, tea}\}) \text{ in } w'$

c. $[\![C']\!]^{w,g[i \rightarrow fi]} = \lambda w. \lambda p. \text{ } p = \lambda w'. \text{ John drank } f_i (\{\text{coffee, tea}\}) \text{ in } w'$

d. $[\![CP]\!]^{w,g} = \lambda w. \lambda p. \exists f_i. \text{ Chf}(f_i) \text{ \& } p = \lambda w'. \text{ John drank } f_i (\{\text{coffee, tea}\}) \text{ in } w'$

For YNQs, it is assumed that there is a distinct Q operator that derives a YNQ reading when the denotation of the IP in a question is a single proposition. This Q operator has a special semantic denotation that takes a single proposition and gives back the set of it and its negation as the question interpretation, as shown in the denotation in (53).[30] With this operator at the CP level, the interpretation of the YNQ (54a) is as in (54b). The Q operator takes the proposition denoted by the IP, and the meaning of the whole sentence is the set of the proposition and its negation, successfully deriving the YNQ reading.

(53) $[\![Q_{YNQ}]\!]^{w,g} = \lambda p. \{\lambda w. \text{ } p(w), \lambda w. \text{ } \neg p(w)\}$

---

[29] *Whether* in YNQs, for example (i), can be analyzed as having the same semantics as that in AltQs. The disjuncts are two clauses and have undergone ellipsis, as in (ii). The overall semantics of the embedded clause is as in (iii), which is very similar to (52d). Since the disjuncts in (ii) are a clause and its negated version, (iii) amounts to the YNQ reading.
(i)   I wonder whether John ate beans or not. (YNQ)   (Han and Romero (2004: 528))
(ii) I wonder whether$_i$ Q t$_i$ [John ate beans] or [John not eat beans].
(iii) $\lambda w. \lambda p. \exists f_i. \text{ Chf}(f_i) \text{ \& } p = f_i (\{\lambda w'. \text{ John ate beans in in } w', \lambda w'. \text{ John did not eat beans in in } w'\})$

[30] There are several other lines of research regarding the semantics of YNQs. Büring (2003: 532), for example, makes the assumption that the denotation of a YNQ is a singleton set of its literal meaning (declarative meaning) as in (i).
(i) $[\![\text{ Can Jack come to tea }]\!]^0 = \{\text{Jack can come to tea}\}$
However, the most standard idea is adopted, namely, questions denote the set of their possible answers and the YNQ operator has the semantics in (53). See, also, the discussion on Japanese YNQs in Chapter 3.

(54) a. Q_{YNQ} Did John come?

   b. $[\![$ (53a) $]\!]^{w,g}$ = {λw. John came in w, λw. ¬John came in w}

To account for the data in (49), it is assumed that there are two possible structures for (49a): *Either* is completely absent, or *either* is covert. When *either* is completely absent, the AltQ reading is obtained with the Q operator and the *wh* operator in (51). Since *either* is absent, the only choice function variable in the structure is the one originating from the *wh* operator. The computation thus proceeds in exactly the same manner as (52), deriving the AltQ interpretation.

(55) a. Did John see a maid or a cook?

   b. $[_{CP}$ Wh i $[_{C'}$ Q $[_{IP}$ John saw $[t_i$ a maid or a cook]]]]

   c. $[\![$ CP $]\!]^g$ = $[\![$ Wh $]\!]^g$ ($[\![$ i C' $]\!]^g$)

   $= [\![$ Wh $]\!]^g$ (λf$_i$. $[\![$ C' $]\!]^{g[i \to fi]}$)

   $= [\![$ Wh $]\!]^g$ (λf$_i$. $[\![$ Q $]\!]^{g[i \to fi]}$ ($[\![$ IP $]\!]^{g[i \to fi]}$))

   $= [\![$ Wh $]\!]^g$ (λf$_i$. $[\![$ Q $]\!]^{g[i \to fi]}$ (λw'. John saw f$_i$({a maid, a cook}) in w'))

   $= [\![$ Wh $]\!]^g$ (λf$_i$. λw. λp. p = λw'. John saw f$_i$({a maid, a cook}) in w')

   $= $ λw. λp. [∃f$_i$. Chf(f$_i$) & p = λw'. John saw f$_i$({a maid, a cook}) in w'] :

   f$_i$ ∈ D$_{Chf}$

When there is a covert *either* adjacent to the DisjP in (49a), its structure is identical to (49b,c). In this case, the IPs in all of the sentences denote a single proposition because of the choice function variable introduced by *either*, which is present in all of the sentences. The choice function variable takes the set denoted by DisjP and gives back a single member of the set; thus, the denotation of the IP ends up as a single proposition. We can derive the YNQ reading for these sentences with the Q operator for YNQs in (53). For sentence (56a), (=(49b)) with an overt *either* in its base position, the Q operator takes the proposition that

the IP denotes and gives back the set of it and its negation, as in (56b). The same account applies to the availability of the YNQ reading in (49a) and (49c).

(56) a. Q_{YNQ} John saw either a maid or a cook

b. $[\![$ (56a) $]\!]^g$ = {λw. ∃f. John saw f({a maid, a cook}) in w, λw. ¬∃f. John saw f({a maid, a cook}) in w}

When there is an overt occurrence of *either*, it is clear that an AltQ reading cannot be derived, since in the present system, both *either* and the *wh* operator introduce a choice function variable. In this case, one of the choice function variable has to take scope over the other, but the one taking wide scope would not have a set to take as an argument; thus, the interpretation would be undefined. It has been shown that by combining the ellipsis analysis and the choice function analysis of *either*, we can account for both the wide scope *or* reading data and the AltQ/YNQ data.

Before closing this section, we will briefly review another analysis that employs choice functions and an analysis that employs focus alternative semantics, and establish whether they explain the same data sets. In the first analysis, *or* introduces the choice function variable that takes as its argument the set of disjuncts, which is the denotation of the DisjP, and the position of Existential Closure determines the scope position of *or* (cf. Winter (2001), Schlenker (2006)). If we combine this analysis with the ellipsis analysis, in which *either* only has the syntactic role of marking the left edge of the first disjunct (cf. Schwarz (1999)), the wide scope *or* data are accounted for in a manner similar to the analysis proposed in this section. With the work of *either*, it is guaranteed that the scope position of *or* is never lower than the position of *either*, since *either* determines the size of the DisjP. For example, the ambiguity of the examples in (43) is derived by claiming that the Existential Closure that binds the choice function variable introduced by *or* can occur in multiple positions, resulting in multiple scope positions of *or*.

(43)   **Ambiguous between NS and WS *or***

a.   Mary is looking for a maid or a cook.

b.   Mary is looking for <u>either</u> a maid or a cook.

=> **No ellipsis/Multiple possible positions of Existential Closure**

[∃f] Mary is looking for [∃f] PRO to FIND f({a maid, a cook})

(cf. Den Dikken et al. (2018))

The wide scope *or* reading of the sentences in (44) is derived via ellipsis. Since *either* marks the left edge of the first disjunct, the position of the choice function variable introduced by *or* coincides with the position of *either*.

(44)   **Unambiguous: only WS *or***

a.   Mary is <u>either</u> looking for a maid or a cook.

b.   Mary <u>either</u> is looking for a maid or a cook.

c.   <u>Either</u> Mary is looking for a maid or a cook.

=> **Involve ellipsis/Existential Closure possible only above DisjP**

a.   Mary is <u>either</u> looking for a maid or ~~looking for~~ a cook.

∃f. Mary is f({looking for a maid, looking for a cook})

b.   Mary <u>either</u> is looking for a maid or ~~is looking for~~ a cook.

∃f. Mary f({is looking for a maid, is looking for a cook})

c.   <u>Either</u> Mary is looking for a maid or ~~Mary is looking for~~ a cook.

∃f. f({Mary is looking for a maid, Mary is looking for a cook})

However, the choice function analysis of *or* cannot derive the AltQ reading in (49a). Previous studies which propose a choice function analysis of *or* focus on the wide scope *or* data, and do not make any attempt to extend the analysis to AltQs. It is shown that the analysis is indeed incompatible with the system adopted here that derives the AltQ

interpretation.

(49) a.   Did John see a maid or a cook?   (AltQ/YNQ)

b.   Did John see either a maid or a cook?   (*AltQ/YNQ)

c.   Did John either see a maid or a cook?   (*AltQ/YNQ)

The YNQ reading of (49a-c) is obtained without any problem. Since the denotation of IP in the sentences is a single proposition because of the choice function variable introduced by *or*, the sentences need a YNQ-type Q-operator and the YNQ interpretation is derived in the same manner as (56).

(56) a. Q_{YNQ} John saw either a maid or a cook

b. $[\![$ (56a) $]\!]^g$ = {λw. ∃f. John saw f({a maid, a cook}) in w, λw. ¬∃f. John saw f({a maid, a cook}) in w}

In contrast, the AltQ reading of (49a) cannot be derived with the *wh* operator in (51b), since this will give rise to two choice function variables in the LF structure of (49a): one originating from the *wh* operator and another from *or*. Once one of the two variables takes the set of the disjuncts as its argument (order irrelevant), the outcome is a single member that the other variable is unable to operate over, which was also the case for (56) as discussed above. For example, consider example (57a), whose underlying structure is in (57b).

(57) a.   Did John drink coffee or tea?

b. $[_{CP}$ wh$_i$ i $[_{C'}$ Q $[_{IP}$ John drank $[t_i$ coffee or tea]]]]

c. $[\![$ *coffee or tea* $]\!]^g$ = f ({coffee, tea})

If we combine this structure with the choice function analysis of *o*r, the denotation of the DisjP is as in (57c), where *or* introduces a choice function variable that takes as its argument the set of the disjuncts. However, it is clear that (57c) cannot be the argument of the choice function variable introduced in the position of the trace of the *wh* operator, since (57c) is a single semantic interpretation that is not a set. It is impossible to derive the AltQ interpretation with this derivation. Thus, it is clear that the choice function analysis of *or* is unable to explain (49a).

Next, a focus alternative semantics analysis is reviewed. As briefly introduced in Chapter 1, the basic idea of focus alternative semantics is that focused items have two semantic values: an ordinary semantic value and a focus semantic value. A focused item *John* has its ordinary denotation as its ordinary semantic value and a set of alternatives (of the same semantic type) as its focus semantic value. An item which is not focused also has the two semantic values, but the focus semantic value is the singleton set of the ordinary semantic value.

Building on the idea that *either* is focus-sensitive (cf. Hendriks (2003), Den Dikken (2006)), Beck & Kim (2006) propose that *either* operates over the focus semantic value of its sister, just like focus-sensitive items like *only* do. Their denotation of *either XP* is in (58), where *either* is proposed to be a focus sensitive operator that takes its sister DisjP as its argument as in (59) and gives rise to "closure" as in (60). (This denotation is aimed to capture the "epistemic" reading of *or* discussed in Zimmermann (2000) among others.)

(58) $[\![$ either XP $]\!]^O$ = for all q in $[\![$ XP $]\!]^F$: may q & ¬∃p [for all q in $[\![$ XP $]\!]^F$:

$$p \cap q = \{\} \ \& \ \text{may p}]$$

(59) $[\![$ either it is raining or it is snowing $]\!]^O$ = may r & may s & ¬∃p [p ∩ r = {} &

$$p \cap s = \{\} \ \& \ \text{may p}]$$

(60)   Either it is raining or it is snowing.

≈ It is possible that it is raining and it is possible that it is snowing and there are

no other relevant possibilities.   (Beck & Kim (2006: 201))

The focus alternative semantics analysis, however, faces an empirical problem when we try to explain the wide scope *or* data. That is, it makes a wrong prediction for the scope of disjunction introduced in (37) and (38), repeated in (61). Recall that (61a) is ambiguous between wide scope and narrow scope *or* readings whereas (61b-d) only have a wide scope *or* reading.

(61) a.   Mary is looking for <u>either</u> a maid or a cook.

   b.   Mary is <u>either</u> looking for a maid or a cook.

   c.   Mary <u>either</u> is looking for a maid or a cook.

   d.   <u>Either</u> Mary is looking for a maid or a cook.

According to the denotation in (58), *either* makes use of the focus semantic value of its sister and gives back an ordinary semantic value. This analysis, however, makes wrong predictions for (61a) since we have no way to get the wide scope *or* reading of (61a) (corresponding to the set *{Mary is looking for a maid, Mary is looking for a cook}*). When *either* is in the leftmost position as in (61d), generating this interpretation is unproblematic since the focus semantic value directly yields the wide scope *or* reading (assuming an ellipsis analysis as Beck & Kim (2006) do). In contrast, when *either* is in its base position or in "intermediate" positions as in (61a-c), *either* would close the alternatives in its overt position and we end up with a reading in which the alternatives only project up to the sister position of *either*. In the case of (61b,c) (the "intermediates"), the reading that results would be equivalent to the wide scope *or* reading, but (61a) would be problematic because we only predict the narrow scope reading.

Claiming that *either* projects up the focus semantic value of its sister is not a possible move, taking into consideration the AltQ/YNQ data:

(62) a.　Did John see a maid or a cook?　　　(AltQ / YNQ)

　　　b.　Did John see either a maid or a cook?　(*AltQ / YNQ)

According to Beck & Kim (2006), the AltQ reading available for sentences like (62a) comes from the focus semantic value that projects up to the TP level and is lifted to the ordinary semantic value by the work of the covert Q operator in the C position. Given that the AltQ reading is unavailable when *either* comes in as in (62b), it is clear that *either* does not pass up the focus semantic value of its sister node but closes the alternatives in the position it occupies. It thus seems difficult to explain the availability of the wide scope *or* reading available for sentences with *either* adjacent to the DisjP by giving *either* some semantic role related to focus.

　　　This section has laid out a choice function analysis of *either* that, combined with the syntactic analysis proposed earlier in this chapter, accounts for both the wide scope *or* data and the AltQ/YNQ data. The next section focuses on how the data introduced in Section 1.2. are handled with the analyses proposed in this thesis.

2.2.2.　*Comparison between English and Japanese*

　　　Comparing the semantic proposal for English described in Section 2.2.1. and that for Japanese in Chapter 3, a point common to both analyses is that they employ choice functions. In English, *either* and an unpronounced *wh* operator in AltQs introduce a choice function variable. In Japanese, *dotti*, an indeterminate expression, denotes a set of choice functions and *ka* introduces a choice function variable, so *dottika* 'either' denotes a choice function.

　　　The choice function analyses for English and Japanese account for the wide scope *or* data, reviewed in Section 1.2.1. As demonstrated in Section 2.2.1., the distribution of the wide scope and narrow scope *or* reading in the English *either/or* construction is explained by a hybrid analysis of a choice function analysis of *either* and an ellipsis analysis. For

Japanese, the relevant data set is repeated below. Sentence (63) with nominal disjuncts has both narrow scope and wide scope *or* readings, whereas the sentences in (64) with VP or clauses as disjuncts only have a wide scope *or* reading.

(63)   **Sentences with nominal disjuncts: ambiguous between NS and WS *or***

Gengo-gakka-ga   [oninron-no   kenkyuusya ka onseigaku-no

linguistics-department-Nom phonology-NO   scholar   or   phonetics-NO

kenkyuusya](-no dottika)-o   sagasiteiru.

scholar-Gen   either-Acc   looking.for

'The linguistics department is looking for either a phonologist or a phonetician.'

(64)   **Sentences with VPs or clauses as disjuncts: only WS *or***

a.   Gengo-gakka-ga   [oninron-no   kenkyuusya-o sagas-i   ka

linguistics-department-Nom phonology-NO   scholar-Acc   look.for-Con or

onseigaku-no   kenkyuusya-o sagas-i   ka] dottika(-o) siteiru.

phonetics-NO   scholar-Acc   look.for-Con or either-Acc doing

'The linguistics department is either looking for a phonologist or a phonetician.'

b.   Gengo-gakka-ga   oninron-no   kenkyuusya-o sagasiteiru   ka

linguistics-department-Nom phonology-NO   scholar-Acc   looking.for   or

onseigaku-no   kenkyuusya-o sagasiteiru   ka-no   dottika da.

phonetics-NO   scholar-Acc   looking.for   or-NO either   Cop

'Either the linguistics department is looking for a phonologist or a phonetician.'

The Japanese data can be accounted for with basically the same analysis as the English analysis, although there is no ellipsis employed in the Japanese data. Based on the semantic analysis proposed in Chapter 3, (63) has (65a) as its underlying form and (65b) as its denotation.

(65) a.　Gengo-gakka-ga　　　　　　　[TP PRO [DisjP oninron-no　　　kenkyuusya　ka

　　　linguistics-department-Nom　　　　　　　phonology-NO　scholar　　　or

　　　onseigaku-no　kenkyuusya]-no dottika-o　　TO　FIND] sagasiteiru.

　　　phonetics-NO　scholar-Gen　　　either-Acc　　　　　looking.for

　b.　[[(65a)]]= λw′. the linguistics department is looking for [λw. ∃f*. the linguistics

　　　　　department to find f*({a phonologist in w, a phonetician in w}) in w]

　　　　　in w′: f* ∈ D_{Chf}

(65b) is the narrow scope *or* reading. If Existential Closure takes place in the main clause,

the wide scope *or* reading is obtained. The sentences in (64) correspond to the English

examples in (44), and they are also explained in a similar manner to the English example

in (48). The underlying form of (64a) is in (66a), and the denotation that is equivalent to

the wide scope *or* reading is in (66b).

(66) a.　Gengo-gakka-ga [DisjP PRO oninron-no　　kenkyuusya-o TO　FIND　sagas-i

　　　ling-dep-Nom　　　　　phonology-NO scholar-Acc　　　　look.for-Con

　　　ka PRO onseigaku-no　kenkyuusya-o TO　FIND　sagas-i　　ka] dottika(-o)

　　　or　　　phonetics-NO　scholar-Acc　　　　　look.for-Con　or　either-Acc

　　　siteiru.

　　　doing

　b.　[[(66a)]] = λw″. ∃f*. f_i ({λw′. λx. x is looking for [λw. the linguistics department

　　　　　to find a phonologist in w] in w′, λw′. λx. x is looking for [λw. the

　　　　　linguistics department to find a phonetician in w] in w′}) (w″)(the

　　　　　linguistics department)

Since the disjuncts in the sentences are overtly VPs and clauses, the sentences cannot have

the narrow scope *or* reading, along the same line of reasoning as with the English examples.

It has thus been shown that the semantic computation is the same in the two languages, and the difference lies in the syntactic operation, namely, ellipsis.

The AltQ/YNQ data set was another point where English and Japanese apparently differ from each other. The English example in (67a) is ambiguous between an AltQ and a YNQ, while the examples in (67b,c) with *either* are unambiguously YNQs.

(67) a. Did John see a maid or a cook?　　　(AltQ/YNQ)

　　 b. Did John see either a maid or a cook?　(*AltQ/YNQ)

　　 c. Did John either see a maid or a cook?　(*AltQ/YNQ)

According to the analysis proposed in Section 2.2.1., the AltQ reading of (67a) is obtained by the work of a covert *wh* operator, and the YNQ reading of (67a-c) is obtained by the work of an overt or covert *either*.

In Japanese, in contrast, there is no ambiguity in the interrogative sentences. (68) with *dotti* 'which' is unambiguously an AltQ, while (69) with *dottika* 'either' or neither *dotti* 'which' nor *dottika* 'either' is unambiguously a YNQ.

(68)　　Taro-ga koohii ka kootya-no dotti-o　　 nomi-masi-ta ka? (AltQ/*YNQ)

　　　　T-Nom coffee or tea-NO　　which-Acc drink-Pol-past Q

　　　　'Which did Taro drink: coffee or tea?'

(69)　　Taro-ga koohii ka kootya(-no dottika)-o nomi-masi-ta　ka? (*AltQ/YNQ)

　　　　T-Nom coffee or tea-NO　　either-Acc drink-Pol-past Q

　　　　'Did Taro drink either coffee or tea?'

According to the analysis proposed in Chapter 3, the AltQ reading of (68) is essentially derived by the work of *dotti* 'which' and the Q particle *ka*, and the YNQ reading of (69) is derived by the work of the overt or covert *dottika* 'either.'

When the semantic analyses proposed for the two languages are compared, the only difference between the analyses is whether the *wh* operator and *dotti* 'which' are overt or not. In other words, *dotti* 'which' in Japanese can be understood as an overt version of the *wh* operator employed in English. The AltQ/YNQ data also indicate that the sentences in English and Japanese have similar lexical items with similar denotation, and the interpretations of the sentences are derived in the same way.

3. Summary of the Chapter

This chapter has focused on the syntax and semantics of the English *either/or* and AltQ constructions and compared them with those of the corresponding Japanese constructions. The aim was to account for the data sets introduced earlier in this chapter. In the syntactic analysis proposed in this chapter, in both English and Japanese, *either* or *dottika/dotti* 'either/which' is adjacent to the DisjP. However, the syntactic category of *either* and *dottika/dotti* 'either/which,' and whether ellipsis takes place within the disjuncts, differ between English and Japanese. Because of these differences, the disjunction construction is much more complex in Japanese than in English, and *either* can appear in various positions in a sentence while *dottika* 'either' cannot. In the semantic analysis laid out in this chapter, *either* and a covert *wh* operator in English and *dottika/dotti* 'either/which' in Japanese all introduce choice function variables, and the analysis successfully explains the wide scope *or* data and AltQ/YNQ data. The difference in the distribution of AltQ and YNQ readings in English and Japanese is explained by claiming that *dotti* 'which' in Japanese and the covert *wh* operator in English eventually accomplish the same semantic role, but *dotti* 'which' has to be overt, while the *wh* operator is covert.

## Appendix: A Compositional Semantics of DisjPs

In the appendix of Chapter 3, it was shown that deriving the denotation of a DisjP in Japanese, namely, a set of the disjuncts, is difficult if we try to extend the analysis of the

Japanese *mo* proposed by Mitrović and Sauerland (2016). In this section, a compositional semantics of *or* is argued for. It is demonstrated that sentence (70a) can be computed compositionally with the semantics of *either* in the present proposal. On the assumption that the lower copy of subjects, which resides inside the VP, is interpreted, (70b) is the representation of (70a) that is subject to semantic computation, with covert *either* in its base position.

(70) a.   John only saw Bill_F or Sue_F.

   b.   Only [_IP John saw [_XP Op_i either_i Bill_F or Sue_F]].

Recall that the syntactic structure of *either A or B* is claimed to be as in (24). Below the semantic denotation of the Disj head is discussed, assuming that the κ head is an identity function that does not contribute to the semantics in English.

(24)   The structure of the *either/or* construction and AltQs in English
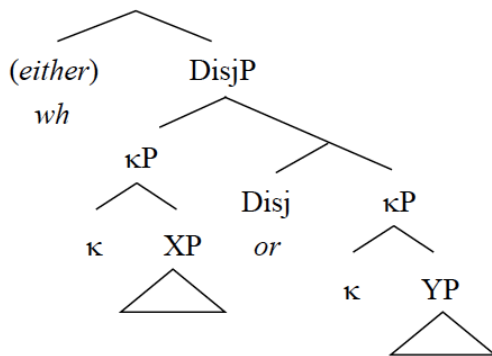
The ordinary semantic value and the focus semantic value of XP in (70b) are computed as in (71). Here, *either* is a non-focused item that has an ordinary semantic value (which is a choice function variable) and a focus semantic value (which is a singleton set of this choice function variable).

(71) a. $[\![\ Op_i\ \textit{either}_i\ DisjP\ ]\!]^{g,O} = [\![\ \textit{either}_i\ DisjP\ ]\!]^{g[i \to fi],O}$: $f_i \in D_{Chf}$

$= [\![\ \textit{either}_i\ ]\!]^{g[i \to fi],O} ([\![\ DisjP\ ]\!]^{g[i \to fi],O})$: $f_i \in D_{Chf}$

$= f_i ([\![\ DisjP\ ]\!]^{g[i \to fi],O})$: $f_i \in D_{Chf}$

b. $[\![\ Op_i\ \textit{either}_i\ DisjP\ ]\!]^{g,F} = [\![\ \textit{either}_i\ DisjP\ ]\!]^{g[i \to fi],F}$: $f_i \in D_{Chf}$

$= \{P(y): P \in [\![\ \textit{either}_i\ ]\!]^{g[i \to fi],F}\ \&\ y \in [\![\ DisjP\ ]\!]^{g[i \to fi],F}\}$:

$f_i \in D_{Chf}$

$= \{f_i(y): y \in [\![\ DisjP\ ]\!]^{g[i \to fi],F}\}$: $f_i \in D_{Chf}$

(72a,b) illustrate the two semantic values of *or*. *Or* has a set-forming function. In its ordinary semantic value, *or* takes two arguments of the same type and forms a set of them. Its focus semantic value is a singleton set of this function.

(72) a. $[\![\ \textit{or}\ ]\!]^{g[i \to fi],O} = \lambda x_\sigma.\ \lambda y_\sigma.\ \{x, y\}$

b. $[\![\ \textit{or}\ ]\!]^{g[i \to fi],F} = \{\lambda x_\sigma.\ \lambda y_\sigma.\ \{x, y\}\}$

The result of combining *or* with the disjuncts (i.e., the ordinary and focus semantics values of the DisjP) is illustrated in (73). The ordinary semantic value of DisjP is the set of the disjunct denotations. Since the disjuncts are focused, the focus semantic value is the set of sets of the alternatives of the disjuncts.

(73) a. $[\![\ \textit{Bill}_F\ \textit{or}\ \textit{Sue}_F\ ]\!]^{g[i \to fi],O} = \{Bill, Sue\}$

b. $[\![\ \textit{Bill}_F\ \textit{or}\ \textit{Sue}_F\ ]\!]^{g[i \to fi],F} = \{\{x,y\}\ |\ x \in [\![\ \textit{Bill}_F\ ]\!]^{g,F}\ \text{and}\ y \in [\![\ \textit{Sue}_F\ ]\!]^{g,F}\}$

The interpretation of XP in (70) is the outcome of combining (71) and (73) displayed in (74). The ordinary semantic value is the result of applying the choice function denoted by *either* to the set of disjuncts, as in (74a). The focus semantic value is the result of combining

the singleton set containing this choice function, which is the focus semantic value of *either*, and (73b) via Pointwise Functional Application.

(74) a. $[\![\text{ XP }]\!]^{g[i\,\rightarrow\,f_i],O} = f_i(\{\text{Bill, Sue}\})\colon f_i \in D_{Chf}$

b. $[\![\text{ XP }]\!]^{g[i\,\rightarrow\,f_i],F} = \{f(A)\colon f \in \{f_i\} \ \& \ A \in \{\{x,y\} \mid x \in [\![\text{ } Bill_F \text{ }]\!]^{g,F} \text{ and } y \in [\![\text{ } Sue_F \text{ }]\!]^{g,F}\}\}\colon$
$$f_i \in D_{Chf}$$

The alternatives of the focus semantic value expand up to the IP level, resulting in (75). Notice that *either* and Op are necessary above the DisjP to resolve a type mismatch that would occur without them when *saw* is combined with the DisjP.

(75) a. $[\![\text{ IP }]\!]^{g[i\,\rightarrow\,f_i],O} = \text{John saw } f_i(\{\text{Bill, Sue}\})\colon f_i \in D_{Chf}$

b. $[\![\text{ IP }]\!]^{g[i\,\rightarrow\,f_i],F} = \{\text{John saw } x\colon x \in \{f(A)\colon f \in \{f_i\} \ \& \ A \in \{\{x,y\} \mid x \in [\![\text{ } Bill_F \text{ }]\!]^{g,F}$

and $y \in [\![\text{ } Sue_F \text{ }]\!]^{g,F}\}\}\}\colon f_i \in D_{Chf}$

Now *only*, whose denotation used here is in (76), comes into the structure.[33] The interpretation of (70b) is given in (77), assuming that Existential Closure of the choice function variable takes place above the whole proposition.

---

[33] Another denotation proposed for *only* other than that in (76) is the one suggested by Beck and Kim (2006) in (i).

(i) $[\![\text{ only } \phi \ ]\!]^O = \lambda w. \ \forall p[p(w) = 1 \ \& \ p \in [\![\text{ } \phi \text{ }]\!]^F] \ (p = [\![\text{ } \phi \text{ }]\!]^O)\colon [\![\text{ } \phi \text{ }]\!]^O = 1$
(adapted from Beck and Kim (2006: 176))

The denotation in (76), which is based on van Rooij and Schulz (2007), is adopted because (i) is problematic when (ii) is considered.

(ii)   John only introduced [Bill and Mary]_F to Sue.   (van Rooij and Schulz (2007: 195))

In (ii), propositions of the form $\lambda w.$ *John introduced x to Sue in w*, where *x* is a focus alternative to *Bill and Mary*, are in the focus semantic value of the IP. Propositions $\lambda w.$ *John introduced Bill to Sue in w* and $\lambda w.$ *John introduced Mary to Sue in w* are among these propositions, but according to the semantics of *only* in (i), these would have to be false in order for the sentence to be true, which contradicts the actual interpretation. Van Rooij and Schulz (2007) state that this problem can be avoided by modifying the semantics of *only* by following a line of research that uses entailment (cf. Krifka (1993), Schwarzchild (1994)) as in (76) (although they do not pursue this approach in the end).

(76) $[\![\text{ only } \phi \,]\!]^O = \lambda w. \forall p[p(w) = 1 \,\&\, p \in [\![\, \phi \,]\!]^F] \, (p \supseteq [\![\, \phi \,]\!]^O): [\![\, \phi \,]\!]^O = 1$

(77) $[\![\, (70b) \,]\!]^{g[i \,\to\, fi],w,O}$

$= \exists f_i. \; f_i \in D_{Chf}$ and for all p such that $p(w) = 1 \,\&\, p \in \{\text{John saw } \{f(A): f \in \{f_i\} \,\&\,$

$A \in \{\{x,y\} \mid x \in [\![\, Bill_F \,]\!]^{g,F} \text{ and } y \in [\![\, Sue_F \,]\!]^{g,F}\}\}\}: p \supseteq \text{John saw } f_i \,(\{Bill, Sue\})$

(77) corresponds to the reading in which John only saw Bill, among other candidates, or John only saw Sue, among other candidates, but the speaker forgot whom John actually saw.[34]

This section has presented a compositional semantics of DisjPs. The semantics of a DisjP is computed from the denotation of the disjuncts and *or* via Functional Application for its ordinary semantic value, and via Pointwise Functional Application for its focus semantic value. The proposed semantics of DisjPs is fully consistent with the basic idea of focus alternative semantics, whereby the ordinary semantic value is a member of the focus semantic value, as Rooth (1992: 76) originally states: "As I define things, the ordinary semantic value is always an element of the focus semantic value." It is easily understood that this is true for the proposed semantics of DisjPs, since the ordinary semantic value in (78a) is a member of the focus semantic value in (78b).

(78) a. $[\![\, Bill_F \text{ or } Sue_F \,]\!]^{g[i \,\to\, fi],O} = \{Bill, Sue\}$

     b. $[\![\, Bill_F \text{ or } Sue_F \,]\!]^{g[i \,\to\, fi],F} = \{\{x,y\} \mid x \in [\![\, Bill_F \,]\!]^{g,f} \text{ and } y \in [\![\, Sue_F \,]\!]^{g,f}\}$

---

[34] There is another reading for (70a), in which the only possibile pair of people that John saw is Bill or Sue, among other various pairs of people. The problem of this reading is that, to obtain this reading, Existential Closure needs to occur within the scope of *only*. This makes it difficult for the existential operator to bind the choice function variable in the presupposition. This problem is left for future research.

Chapter 5

Concluding Remarks

This thesis has investigated the syntax and semantics of the *either/or* construction and Alternative Questions (AltQs) in English and Japanese, in (1) and (2).

(1) a. Taro-wa koohii ka kootya-no dottika-o nonda.

   T-Top coffee or tea-NO either-Acc drank

   'Taro drank either coffee or tea.'

   b. Taro drank either coffee or tea.

(2) a. Taro-wa koohii ka kootya-no dotti-o nomi-masi-ta ka?

   T-Top coffee or tea-NO which-Acc drink-Pol-past Q

   'Which did Taro drink: coffee or tea?'

   b. Did Taro drink coffee or tea?

The questions examined in this study are listed as follows:

(3) a. In the Japanese examples, how are *A ka B* 'A or B' and *dottika/dotti* 'either/which' syntactically analyzed?

   b. How are *A ka B* 'A or B' and *dottika/dotti* 'either/which,' with the syntactic structure revealed in (3a), semantically computed and how are the possible interpretations derived?

   c. What different syntactic and semantic properties are observed for the Japanese and English constructions?

   d. How can we account for the properties in (3c)?

For (3a), the discussion in Chapter 2 has shown that the two constructions in Japanese

have syntactic characteristics in common with partitives, and they should be analyzed as a type of partitive. The proposed structure contains two DPs, one including the Disjunction Phrase (DisjP) that corresponds to the whole element and the other including *dottika/dotti* 'either/which' that corresponds to the part element. In between there is a Functional Projection (FP) that takes the whole element as its argument and resides in the specifier position of the DP that corresponds to the part element. The discussion led to the conclusion that, although the surface forms of the Japanese *either/or* and AltQ constructions in (1) and (2) may seem simple, namely, a DisjP, *no*, and *dottika/dotti* 'either/which,' the constructions have a complex hierarchical structure with two DPs and an FP.

For (3b), Chapter 3 has established a semantic analysis of the constructions based on the syntactic structure proposed in Chapter 2, in which the FP layer marks the part-whole relation in partitives, and *dottika* 'either' and *dotti* 'which' in the *either/or* and AltQ constructions introduce choice function variables that take as an argument the set denoted by the DisjP. The analysis, combined with the choice function analysis of the Q-particle/existential particle *ka*, correctly derives the intended interpretation of the *either/or* and AltQ constructions.

For (3c), four data sets illustrating the following facts were introduced in Chapter 4: (i) Floating is allowed for English *either* but only marginally for Japanese *dottika* 'either,' (ii) English and Japanese DisjPs can have disjuncts of various syntactic categories, (iii) in English, the possible readings regarding the scope of *or* change in accordance with the position of *either*, while in Japanese all the relevant sentences have both a narrow scope and wide scope *or* reading, and (iv) the distribution of AltQ and YNQ readings differs between English and Japanese.
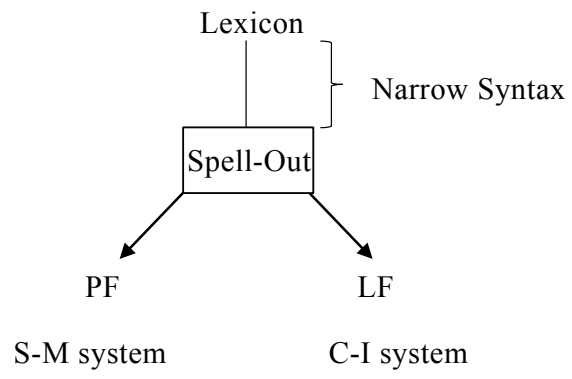
For (3d), the data sets introduced to answer (3c) have been accounted for by the syntactic and semantic analyses presented in Chapter 4. According to the syntactic analysis, the basic syntactic structure is the same in English and Japanese, having *either* and *dottika/dotti* 'either/which' adjacent to the DisjP. However, the syntactic category of *either*

and *dottika/dotti* 'either/which,' and whether ellipsis takes place inside the disjuncts, differ between English and Japanese. These differences lead to the difference in the complexity of the disjunction constructions in the two languages, and the possibility of the floating of *either* and *dottika* 'either.' According to the semantic analysis, the claim that *either* and a covert *wh* operator in English and *dottika/dotti* 'either/which' in Japanese have similar semantics, all of them introducing choice function variables, explains the wide scope *or* data and AltQ/YNQ data. The distribution of AltQ and YNQ readings seems to be different between English and Japanese at first glance, but this is attributed to the surface form of the covert *wh* operator in English and *dotti* 'which' in Japanese. *Dotti* 'which,' an item that functionally corresponds to the covert *wh* operator, has to be overt in Japanese.

This thesis has provided a compositional semantics that derives the possible interpretations of the *either/or* and AltQ constructions in English and Japanese, based on the syntactic structure proposed earlier in this thesis. This explanation conforms to the basic assumption adopted in generative grammar that the semantics of a sentence is computed by combining lexical items step by step, following the syntactic structure.

Further, this thesis has revealed that although the constructions under discussion have different surface forms and properties in English and Japanese, the semantic computations that derive the meaning of the sentences are similar. Specifically, the differences between the two languages arise from differences in the lexicon and the Narrow Syntax, shown in the architecture of grammar in (4) introduced in Chapter 1. The computation in LF and the C-I system, on the other hand, is similar in both languages. This thesis has thus contributed to the research on generative grammar by presenting an example of universality in the semantic component and variation in the lexicon and the Narrow Syntax.

(4)

```
                        Lexicon ⌉
                           |     ├ Narrow Syntax
                        ┌────────┐
                        │Spell-Out│
                        └────────┘
                         ↙      ↘
                    PF              LF

                S-M system      C-I system
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