A Study of English Sentence Adverbs:

How does Modality Contribute to Sentence Adverbs?
A Study of English Sentence Adverbs:
How does Modality Contribute to Sentence Adverbs?

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Abstract
Acknowledgments

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Introduction

It is generally agreed that English adverbs roughly fall into two major classes in terms of the categories which they modify; some modify predicates (henceforth 'predicate modifying adverbs'), while others modify sentences (henceforth 'sentence adverbs'). The present paper is an attempt to clarify the reasons for the occurrence constraints on sentence adverbs.

Some examples of the constraints are illustrated by Jackendoff (1972). Consider the following examples:

(1) a. Did Frank easily beat all his opponents?
    b. *Did Frank probably beat all his opponents?

(2) a. Bill apparently has never seen anything to compare with that.
    b. ??Never has Bill apparently seen anything to compare with that.

3 Jackendoff 84.
4 Jackendoff 85.
5 Jackendoff 85.
(3) a. \(\{\text{Probably}, \text{carefully}\}\) Max \(\{\text{Happily, cleverly}\}\) was climbing the walls of the garden.

b. \(\{\text{Carefully, probably}\}\) Max \(\{\text{Cleverly, happily}\}\)

walls of the garden.

(1a), which has a predicate modifying adverb easily, is acceptable; while (1b), which is accompanied by a sentence adverb probably, is not acceptable. Comparing (2a) with (2b), we may say that inverted sentences are incompatible with sentence adverbs. From the sentences in (3), it is entirely fair to state that their acceptability depends on the order of sentence adverbs.

Several attempts have been made by linguists to clarify the reasons for these constraints. In this article, I shall support the argument that sentence adverbs are modal expressions. In addition, my refined modal approach, which consists of 'criterion of modality' and 'modal hierarchy', will be offered to account for the constraints.

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1 Jackendoff 89.

2 Jackendoff 89.
1. Characteristics of Sentence Adverbs

1.1. Definition of Sentence Adverbs

The category 'adverbial' is a heterogeneous and peripheral category, as being pointed out by Quirk et al. (1985); partly because it includes not only words but also many different kinds of phrases and clauses. On the basis of its function, 'adverbial' can be divided into adjuncts, subjuncts, disjuncts and conjuncts (the term 'adverbial' is used as a cover term); and the term 'adverb' is defined as one word adverbial.

Next, let us consider the definition of sentence adverbs. Quirk et al. (1985) define them like this: "they tend to qualify, by their meaning, a whole sentence or clause, rather than just part of a clause (such as a verb, or a verb and object) . . . ." And they add that: "these adverbials are subdivided into DISJUNCTS (. . . . comment on the form or content of the clause) and CONJUNCTS (. . . ."

---


3 For a similar definition of 'adverb' and 'adverbial', see Ernst 15-16.

4 Quirk, et al. 52.
have a connective function).” That is to say, sentence adverbials consist of disjuncts and conjuncts.

There are, however, some objections against this classification. Nakau (1980) argues that conjuncts are not part of sentence adverbs. His reason is as follows:

However, conjuncts are somewhat peculiar. It is possible to say that they are not adverbs but conjunctions. The reason is that they have the very same function that conjunctions essentially have. Without doubt they are outside the proposition.

... but the fundamental difference between conjuncts and sentence adverbs is that conjuncts do not have the function of qualifying propositional contents. It is because their function is linking not two propositional contents but two sentences which consist of proposition and modality.

That is, his definition excludes conjuncts from sentence adverbs. Although sentence adverbs ‘tend to qualify a whole sentence or clause’, conjuncts do not tend to qualify it; because Quirk et al. (1985) defines conjuncts like this: “they have the function of conjoining independent units rather than one of contributing another facet of information to a single integrated unit.” Furthermore, the definition of Declerck (1991) is this: “conjuncts are

1 Quirk, et al. 52.
3 Quirk, et al. 631.
used to express the logical relation between what the speaker is saying now and the preceding context.”

Therefore, conjuncts are obviously excluded from the definition of sentence adverbs; in other words, sentence adverbs are disjuncts.

1.2. Occurrence Positions of Sentence Adverbs

Numerous attempts have been made by scholars to show the positions of sentence adverbs. Roughly speaking, there are three positions in which sentence adverbs can be put: initial position, medial position and end position. Curme (1931) describes:

We sometimes find the sentence adverb at the very beginning of the sentence, or after the verb at or near the end of the sentence; in the former case followed by a slight pause and in the latter case preceded by a pause, which in both cases marks the adverb or adverbial element as a sentence modifier: 'Un fortunately (pause), the message never arrived,' 'The message, unfortunately, never arrived,' or 'The message never arrived (pause), unfortunately.' . . .

Declerck 234.

From the discussions above, adverbs are divided into 'predicate modifying adverbs', 'sentence adverbs' and 'conjuncts'. For the same classification as this (but the terms are slightly different), see Ando 86.

For a sampling of useful source materials, see Quirk, et al. 490-501; Declerck 216-218; Ota 485-491; Jackendoff 47-107; and Greenbaum, Usage.

Okada (1985), on the other hand, displays the occurrence positions of sentence adverbs on a tree diagram. He writes that sentence adverbs can occur at initial position, end position and medial position of the sentence (strictly speaking, the positions between subject NP and auxiliary verb and between modal auxiliary and perfective auxiliary have), and that these positions have comma-intonation in many cases.

These arguments are supported by McCawley's observations (1983), which examines the distribution of a sentence adverb probably:

(4) The enemy will have destroyed the village.

(5) The village will have been destroyed by the enemy.

1.3. Classification of Sentence Adverbs

The classification of Sentence Adverbs is much connected with the constraints on their occurrences, which

---


3 McCawley 266.
I will examine in Chapter 3. So the classification in this chapter will be the basis of my investigation into the constraints in the next chapter.

Several efforts have been made to classify sentence adverbs. Jackendoff (1972) divides sentence adverbs into two major classes: speaker-oriented adverbs and subject-oriented adverbs. He states that the speaker-oriented adverbs "are understood as relating the speaker's attitude toward the event expressed by the sentence", and the subject-oriented adverbs "somehow comment on the subject of the sentence." However, he regards as sentence adverbs the words such as often, carefully, quickly, stealthily and so on. According to my definition, they are not sentence adverbs but predicate modifying adverbs. Quirk et al. (1985) and Declerck (1991) consider often, quickly and stealthily as adjuncts, and carefully as a subjunct.

A further classification is made by Bellert (1977). Her proposal is based on Jackendoff (1972). In

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1 Jackendoff 56-57.
2 Jackendoff 56.
3 Jackendoff 56.
4 Jackendoff 88.
order to refine Jackendoff (1972), she uses truth-
conditions, and divides speaker-oriented adverbs into some
subclasses. Her classification, however, contains
frequency adverbs, domain adverbs and conjunctive
adverbs, which my definition does not categorize as
sentence adverbs. Consequently, their classifications
are not successful in representing the classes of adverbs.

The endeavors of Quirk et al. (1985) and Declerck
(1991), on the other hand, seem to be successful in repre-
senting classes of sentence adverbs. Fig's 1 and 2
indicate their classifications, which I made up according
to their works:

```
Fig. 1 Classification of Sentence Adverbs by Quirk et al.

Disjuncts
- Style disjuncts (seriously, strictly, etc.)
- Content disjuncts (generally, personally, etc.)

Disjuncts
- Modality and manner (certainly, clearly, etc.)
- Value judgment (correctly, amazingly, etc.)
```

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Fig. 2 Classification of Sentence Adverbs by Declerck.

Disjuncts
- Style disjuncts (personally, seriously, etc.)
- Content disjuncts (obviously, probably, etc.)

Disjuncts
- Truth-evaluating disjuncts (amazingly, oddly, etc.)
- Fact-evaluating disjuncts (cleverly, foolishly, etc.)
```

Sentence adverbs, as we have noticed from the figures

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1 For the source materials which I used to make up, see Quirk, et al. 615-623; and Declerck 232-234.
above, are divided into two main classes: style disjuncts (henceforth Style) and content disjuncts (henceforth Content). Quirk et al. (1985) define Style as: "style disjuncts convey the speaker's comment on the style and form of what he is saying, defining in some way under what conditions he is speaking as the 'authority' for the utterance." The same holds true of the definition of Declerck (1991). As for Content, Quirk et al. (1985) refer it as: "content disjuncts . . . make observations on the actual content of the utterance and its truth conditions." The same is true of Declerck's definition. Their classifications are the same but two differences. The first is that Quirk et al. (1985) divide Style into two subclasses; while Declerck (1991) does not divide it. The second difference is that Quirk et al. (1985) classify Content into 'degree of truth' and 'value judgement'; Declerck (1991), on the other hand, divides it into 'Fact-evaluating disjuncts' (henceforth Fact-evaluating), 'Truth-evaluating disjuncts' (henceforth Truth-evaluating) and 'Subject-evaluating disjuncts'

1 Quirk, et al. 615.
2 Declerck 232.
3 Quirk, et al. 615.
4 Declerck 232.
(henceforth Subject-evaluating). Although their classifications are slightly different, the members included in them are the same. 'Truth-evaluating' corresponds to 'degree of truth'; 'Fact-evaluating' and 'Subject-evaluating' are identical with 'value judgement'.

Finally, let us consider the classification by Nakau (1980). Fig. 3 indicates his classification, which I made up according to his study:

```
Sentence-adverbs:
  - Speech-act (seriously, strictly, etc.)
  - Value-judgment (fortunately, luckily, etc.)
  - Truth-judgment (certainly, clearly, etc.)
  - Subject-oriented value-judgment (wisely, cleverly, etc.)
```

Fig. 3 Classification of Sentence Adverbs by Nakau.

His classification is the same as Declerck's. Speech-act, Truth-judgment, Value-judgment and Subject-oriented value-judgment correspond to Style, Truth-evaluating, Fact-evaluating and Subject-evaluating, respectively.

All members of sentence adverbs that these three attempts establish conform to my definition of sentence adverbs. They seem to be successful in classifying sentence adverbs. In this paper, I will adopt Declerck's classification and terms.

1 For the same classification of Content as Declerck, see Sawada 6.

2 Nakau (1980) uses Japanese terms to refer to each class; in this paper I translated them into English.
2. Occurrence Constraints on Sentence Adverbs

2.1. Occurrence Constraints in Sentence Types

As we have seen in Introduction, there are some constraints which prevent sentence adverbs from occurring. In this chapter, the constraints will be clarified in terms of my classification.

First, let us consider the constraints in questions. Consider the following examples:

(6) a. Seriously, do you intend to resign?
   b. Truthfully, is Merlin a genius?

(6) shows that Style can occur in questions. Next, let us consider whether Fact-evaluating can occur in questions. Here are two illustrative examples:

(7) a. *Fortunately, did John examine all the cases?
   b. *Surprisingly, will they leave early?

(7) illustrates that Fact-evaluating cannot occur in questions. Next, what about Truth-evaluating? Consider:

3. Okada, Fukushi 152.
(8) = (1b) *Did Frank probably beat all his opponents?

(9) {\begin{align*}
\text{*Has } & \text{ probably } \\
\text{*Will John } & \text{ certainly } \text{ come?} \\
& \text{ evidently}
\end{align*}}

(10) *Who certainly finished eating dinner?

From the examples above, we notice that Truth-evaluating cannot occur in questions. As for Subject-evaluating, the examples below show that it can not occur in questions:

(11) \text{*Did John cleverly decide to come here?} \quad (\text{1})
\text{ wisely drop his cup of coffee?} \quad (\text{2})
\text{ carefully stop smoking?} \quad (\text{3})

Secondly, let us look into the constraints in tag questions. Tag questions have two functions. Tags with rising intonations, on one hand, are the same in function as yes-no questions; tags with falling intonations, on the other, have the function of speaker's confirmation. The latter function is illustrated by Leech and Svartvik (1975):

---

1 Bellert 344.  
2 Jackendoff 84.  
3 Bellert 340.  
If the tag question has a falling tone, the positive or negative bias is stronger, and the tag question merely asks for routine confirmation of what the speaker already believes. The sentence is more like a statement than a question.

Here, I am concerned only with tag questions which have falling tones.

Now consider the constraints in Tags. To begin with, let us consider whether Style can occur or not. Consider the following:

(12) *Seriously, we haven’t heard much of our two heros lately, have we?

(12) shows that Style can occur in tags. Furthermore, the fact that Style can occur in question sentences proves that it can occur in both types of tag questions. Next, concerning the constraints on Fact-evaluating, one example is given by Nakau (1980):

(13) *Surprisingly, John objected to the plan, didn’t he?

Judging from (13), it is impossible for Fact-evaluating to

---

occur in tags. Now, on Truth-evaluating, consider (14):

(14) a. Frank probably beat all his opponents, didn't he?  
b. Charley evidently discovered a flaw in my argument, didn't he?

Examples above indicate that Truth-evaluating can occur in tags. As for Subject-evaluating, the following examples demonstrate that it can not occur in tags:

(15) *Carefully, John dropped his cup of coffee, 
    *Cleverly, 
    didn’t he?

(16) *Rightly, John sent a gift to Mary, didn’t he?

(17) *John cleverly stopped smoking, didn’t he?

In (15) and (17), the sentences are not acceptable. My informant remarked about (16) that; it is not acceptable, but can not be rejected ‘completely’, and he finds it very difficult to place it there. He adds, furthermore, that cleverly in (17) may be used to modify what the speaker just said in expressing his/her second thought in spoken

---

1 Jackendoff 85.
2 Jackendoff 85.
3 The acceptability of these examples were judged by my informant, who is a British teacher. In this paper, the sentences without their sources mean that they were judged by him.
English. But it is not the tags with which I am concerned. So the examples above make it clear that Subject-evaluating can not occur in tags.

Thirdly, let us discuss the constraints in inverted sentences. Consider the following sentences:

(18) a. *Frankly, never have I set out to educate my readers.

b. *Never have I frankly set out to educate my readers.

c. *Never have I set out to educate my readers, frankly.

(19) \[
\begin{align*}
&*Frankly, \\
&*Strictly, \text{ so fast did Tom run that he got to} \\
&?Generally, \\
&?Briefly, \\
\end{align*}
\]

Texas in ten minutes.

(20) \[
\begin{align*}
\text{Never did Tom run so fast,} & \quad *\text{strictly.} \\
& *\text{generally.}
\end{align*}
\]

These sentences show that Style is difficult to occur in inverted sentences. My informant mentioned that (18c) might be acceptable, if frankly is separated from the rest of the sentence by a long pause. But he said it expresses the speaker's second thought in spoken English. As for (19), except the items which are marked with *, he
suggested it is very difficult to judge the sentences. According to his remark about (20), *frankly* is acceptable; but if it is at initial or medial position, it is not acceptable; because he marked the sentences (18) and (19) with ? and *. In conclusion: Style is not easy to occur in inverted sentences. In this paper, I will mark that type of sentences with '*?'.

Next we shall look into the constraints on other sentence adverbs in inverted sentences. Let us bring them together. The examples are given below:

(21) a. = (2b) ??Never has Bill *apparently* seen anything to compare with that.

   b. ??So fast did Tom *probably* run that he got to Texas in ten minutes.

   \[
   \begin{aligned}
   &\{\text{possibly}\} \\
   &\{\text{probably}\} \\
   &\{\text{certainly}\}
   \end{aligned}
   \]

(22) a. *Never will they leave early.*

   b. *Never did John go there, probably.*

   c. *Not wisely did they accept the award.*

---

1. Jackendoff 85.
d. \{\*Rarely\} did John \{\textit{probably} \textit{fortunately} \textit{wisely}\} run so fast.

e. \*Never did they \textit{wisely} accept the award.

It can be concluded that Fact-evaluating, Truth-evaluating and Subject-evaluating are not compatible with inverted sentences.

Furthermore, let us look into the constraint in imperative sentences. Consider the following sentences:

(23) \textit{Honestly,} \{don't tell him about it. \textit{Confidentially,} \{let's not tell him about it.}

(24) \{\*Oddly \textit{(enough)},

a. \{\*Cleverly, \textit{Certainly,} \textit{Certainly,}\} \\

b. \{\*Annoyingly, \textit{Foolishly,} \textit{Admittedly,} \textit{do it at once, John.} \textit{let's do it at once.}\}

\footnotesize{\textsuperscript{1} Nakau, "Bun-fukushi" 187.}
\footnotesize{\textsuperscript{2} Okada, \textit{Fukushi} 147.}
\footnotesize{\textsuperscript{3} Nakau, "Bun-fukushi" 187.}
\footnotesize{\textsuperscript{4} Greenbaum, \textit{Usage} 85.}
\footnotesize{\textsuperscript{5} Okada, \textit{Fukushi} 152.}
\footnotesize{\textsuperscript{6} Greenbaum, \textit{Usage} 112.}
The examples shown above lead to the conclusion that; Style can occur in imperatives, while other sentence adverbs can not.

There are, however, varying opinions as to whether sentence adverbs are compatible with imperatives or not. The difference depends on whether Style is categorized as sentence adverbs. For instance, Schreiber (1971), who categorizes Fact-evaluating and Truth-evaluating as sentence adverbs, describes: "sentence adverbs do not occur in imperatives." Moreover, Sawada (1978), who regards Content as sentence adverbs, notes that: "English sentence adverbials are not compatible with imperatives (probably with 'hortatory' sentences)." In this study, Style and Content are defined as sentence adverbs, so that their opinions can not be objections against my argument.

On the other hand, Davies (1986) states that sentence adverbs can occur in imperatives. He provides two adverbs: perhaps and incidentally. He describes that:


"perhaps seems to be compatible with an imperative used to convey a tentative suggestion rather than a forthright command." But it is irrelevant to my discussion, because I consider forthright commands as imperatives. This is corroborated by Konishi ed. (1989) in saying that: "perhaps is not normally compatible with imperatives used to convey a pure 'command'." His examples are given below as (25):

(25) a. *Perhaps drive the car.
   b. *Perhaps come tomorrow.

Examples in (25) are not tentative suggestions but forthright commands, so that they are unacceptable. As for incidentally, it is not my concern, since it is a member of conjuncts. Therefore, only Style can occur in imperatives.

Finally, let us inquire into the constraints in optative sentences. There is no disagreement on the point

---


3 Konishi, ed. 1370.

4 Konishi, ed. 1370.

5 For a sampling of useful source materials, see Quirk, et al. 627; and Greenbaum, *Usage* 85.
that Content is not compatible with optatives. However, scholars disagree about Style. Okada (1985) remarks that all sentence adverbs are not compatible with optatives. Here are some illustrative examples by Okada (1985):

(26) \[
\begin{align*}
&\text{*Frankly,} \\
&\text{*Candidly,} \\
&\text{*Surprisingly,} \\
&\text{*Wisely,} \\
&\text{*Certainly,}
\end{align*}
\]

\[
\text{may you have a good time!} \\
\text{God save the queen!}
\]

There is an objection against this argument; Style can occur in optatives, but Content cannot. Consider:

(27) a. Honestly, God save him!

(27) indicates that Style can occur in optatives. Added to these examples, Greenbaum (1969) asserts that: “many [style disjuncts] may freely appear in front of imperative and optative clauses, and even when the clauses are negated. . . . Other style disjuncts seem to be unacceptable in these types of clauses.” It follows from this remark that ‘some’ Style such as frankly and

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1. Okada, Fukushi 152.
2. Amano 58.
3. Amano 58.
4. Greenbaum, Usage 85.
*candidly in (26) can not occur in optatives. In this article, I will represent the acceptability of this case as OK?; because ‘many’ can occur, but ‘some’ can not.

From the discussions above, we can represent the results of the occurrence constraints diagrammatically as follows:

Table 1 The Occurrence Constraints in Sentence Types.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Style</td>
<td>OK</td>
<td>OK</td>
<td>*</td>
<td>OK</td>
<td>OK?</td>
</tr>
<tr>
<td>Fact-evaluating</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Truth-evaluating</td>
<td>*</td>
<td>OK</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Subject-evaluating</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

* Q. = Question sentences

b Tag. = Tag questions (falling intonations)

c Inv. = Inverted sentences

d Imp. = Imperative sentences

e Opt. = Optative sentences

2.2. Co-occurrence Constraints on Sentence Adverbs

Now, let us look into the co-occurrence constraints (order constraints) on sentence adverbs in terms of my classification, and provide their scope relations.

To begin with, let us focus attention on the relation between Fact-evaluating and Truth-evaluating. Consider:

Two sentence adverbs of the same class cannot co-occur. This constraint is discussed by Jackendoff 87; Okada, Fukushima 141; and Nakajima 342.
Thus it is clear that Fact-evaluating has wider scope than
Truth-evaluating.

Next, consider the scope relation between Fact-
evaluating and Subject-evaluating:

(29) \[
\begin{align*}
\{ \text{Happily, Max has carefully} \} & \text{ been trying to} \\
\{ \text{*Carefully, Max has happily} \} & \\
\text{decide whether to climb the walls.}
\end{align*}
\]

(29) shows that Fact-evaluating has to precede Subject-
evaluating.

Furthermore, let us look into the ordering of Truth-
evaluating and Subject-evaluating. (30) provides an
example:

(30) \[
\begin{align*}
\{ \text{Probably, Max carefully} \} & \text{ was climbing the} \\
\{ \text{*Carefully, Max probably} \} \\
\end{align*}
\]

---22---

1 Okada, *Fukushi* 145.


3 Okada, *Fukushi* 145.
walls of the garden.

This example indicates that Subject-evaluating has to follow Truth-evaluating.

Finally, consider the co-occurrence of Style and other sentence adverbs. (31) indicates that no sentence adverbs precede Style:

\[
\begin{align*}
(31) \quad a. \quad & \text{Frankly, John } \begin{cases} \text{surprisingly} \\ \text{obviously} \\ \text{wisely} \end{cases} \text{ left early.} \\
\text{b. *Obviously , John frankly left early.} \\
\end{align*}
\]

The results can be schematized as follows; A>B represents that A has wider scope than B:

\[
\text{Style} > \text{Fact-evaluating} > \text{Truth-evaluating} > \text{Subject-evaluating}
\]

Fig. 4 The Order of Sentence Adverbs (Relative Scopes).

---


2 Okada, *Fukushi* 144.

3 Okada, *Fukushi* 144.
3. Foregoing Studies of Sentence Adverbs

3.1. Approaches by Interpretation Rules

3.1.1. Jackendoff's Study

As was pointed out in 2.3, Jackendoff (1972) divides sentence adverbs (he calls S adverbs) into two categories. He argues that these adverbs and manner adverbs (i.e. predicate modifying adverbs in this article) can be interpreted in terms of his three interpretation rules. The rules are stated as follows:

(32) P speaker: If Fl is a daughter of S, embed the reading of S (including any members of F to the right of Fl) as an argument to the reading of Fl.

(33) P subject: If Advl is a daughter of S, embed the reading of S (including any members of F to the right of Advl) as one argument to Advl, and embed the derived subject of S as the second argument to Advl.

(34) P manner: If \{Adv\} is dominated by VP, attach \{PP\} its semantic markers to the reading of the verb.

---

1 Jackendoff 107.
2 Jackendoff 107.
without changing the functional structure. 

(32) is the rule appropriate to speaker-oriented adverbs (e.g. evidently, happily, frankly). Rule (33) operates on subject-oriented adverbs (e.g. carefully, clumsily, cleverly). Rule (34) functions appropriate to manner adverbs. Jackendoff, furthermore, suggests that the rules appropriate to speaker-oriented adverbs and manner adverbs apply to PPs, S (parentheticals) and epistemic modals, which are designated as F in his rules; Fl is a token of F, and Advl is a token of adverbs. These rules account for the occurrence constraints with which I am concerned in this paper.

Now let us discuss the constraints on sentence adverbs in the light of Jackendoff's proposal. First, we shall consider the occurrence constraints. He suggests that subject-aux inversion causes incompatibility of sentence adverbs with questions and inverted sentences. He describes: "inversion would introduce some semantic factor not present in noninverted forms, and this factor would be incompatible with the readings of S adverbs." In his conclusion, sentence adverbs are not compatible

1 Jackendoff 107.
2 Jackendoff 106.
3 Jackendoff 86.
with questions and inverted sentences; but they are compatible with tags, because tags are not inverted forms. As for the constraints in imperatives and optatives, he does not deal with them.

Next, we will look at his explanation as to the ordering (co-occurrence) constraints. He observes that if a subject-oriented adverb follows a speaker-oriented adverb, the sentence is acceptable, while the opposite order does not work. These constraints can be explained by the rules above. Here, it is helpful to see his illustrative examples and explanation:

(35) a. *Probably Max carefully was climbing the walls.

b. *Carefully Max probably was climbing the walls.

In (35a), P subject applies to carefully, and P speaker applies to probably. The arguments of carefully have the reading of the subject MAX and the reading of the rest of the sentence, which does not include probably. Thus the reading including carefully but excluding probably is CAREFUL (MAX, CLIMB (MAX, THE WALLS)). This is acceptable. The reading including probably is thus

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1 Jackendoff 90.
2 Jackendoff 91.
PROBABLE (CAREFUL (MAX, CLIMB (MAX, THE WALLS))); this reading includes carefully, because carefully is put to the right of probably. This sentence is therefore acceptable. On the other hand, in (35b) P speaker applying to probably takes as an argument the reading of the rest of the sentence. Thus it produces PROBABLE (CLIMB (MAX, THE WALLS). This reading is acceptable. P subject applying to carefully, however, offers CAREFUL (MAX, PROBABLE (CLIMB (MAX, THE WALLS))), which is an ill-formed reading. Therefore, he argues that his rules can account for the constraints.

3.1.2. Abe’s Study

We shall here look at the proposal by Abe (1980). His attempt is based on Jackendoff (1972), and his classification of adverbs is the same as Jackendoff’s. In order to account for the constraints, the interpretation rules and The Scope Hierarchy are provided. ¹

To begin with, let us look at three interpretation rules:

(36) S Adverb Interpretation Rule

¹ Abe (1980) proposes VP Adverb Interpretation Rule and Quantifier Interpretation Rule. I shall omit them, because they are not concerned with this study.

² Abe 114.
where (i) the NP is a speaker and 'n' has one value in the case of a speaker-oriented adverb
(ii) the NP is identical with the subject NP and 'n' has zero value in the case of a subject-oriented adverb

(37) (Sentence) Negative Interpretation Rule

\[ [\text{s} \ldots \text{Adv} \ldots ] \rightarrow [\text{sn ADJ, NP}(\ldots)] \]

(38) Property Interpretation Rule (\(\lambda\)-expression)

Betsy loves Peter \(\rightarrow\) (Betsy), \(\lambda x(x \text{ loves Peter})\)

(36) amalgamates two rules of sentence adverbs of Jackendoff (1972) into one; (i) is the rule appropriate to speaker-oriented adverbs, (ii) is the one appropriate to subject-oriented adverbs. If an adverb is a speaker-oriented one, the parameter 'n' indicates 1; if an adverb is a subject-oriented one, the parameter is 0. These figures correspond to s1 and s0 in The Scope Hierarchy. The rule (37) is the rule to interpret a sentence negation. (38) is the one to interpret a sentence.

Next let us briefly look at the rules concerning the scope:

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1 Abe 115.

2 Abe 115.
The Scope Hierarchy

1 sl scope—speaker-oriented adverb
2 s0 scope—subject-oriented adverb, quantifier, negative
3 VP scope—VP adverb

The Scope Violation

If the Scope Hierarchy is violated, the sentence will be ill-formed.

The Scope Order Hypothesis

Scope Assignments of items which have the same scope depend upon the surface order between restrictive items.

If a sentence adverb violates The Scope Hierarchy, it will be ill-formed according to (40). If more than one element in the same scope co-occurred, the surface order will be the scope order according to (41).

Now let us focus attention on his explanation for the constraints. As for the incompatibility of sentence adverbs with questions, he considers questions (yes-no questions and wh-phrases) as sl scope. Therefore, he

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1 Abe 112-113.
2 Abe 113.
3 Abe 113.
4 Abe 118-119.
asserts that questions do not co-occur with speaker-oriented adverbs. To see this, let us take up his examples, which are illustrated as (42):

(42) \[
\begin{align*}
\text{Clearly, } & \left\{ \begin{array}{l}
\text{when will they leave?} \\
\text{a. *Evidently, will they leave early?} \\
\text{Obviously, will they leave or stay?}
\end{array} \right. \\
\text{b. *Will they, evidently, leave early?} \\
\text{Will they, obviously, leave or stay?}
\end{align*}
\]

Let us turn to the incompatibility with inverted sentences. Consider (43) and (44):

(43) *Never did John probably run so fast.

(44) *[s0 (NEVER) [s1 (PROBABLE, speaker) (John, \\
\lambda x \text{ (x ran so fast))}]]

The reason of the ill-formedness in (43) is that a negative (s0 scope) precedes probably (s1 scope); it produces a scope violation. As for the constraints in imperatives and optatives, he also does not deal with them.

Finally, let us briefly look at his explanation of

---30---

1 Abe 118.
2 Abe 118.
3 Abe 111.
4 Abe 116.
the co-occurrence constraints. Consider (45) and (46):

(45) a. Probably, Max carefully was climbing the walls of the garden.

b. *Carefully, Max probably was climbing the walls of the garden.

(46) a. [sl (PROBABLE, speaker) [s0 (CAREFUL, Max) (Max, \( \lambda x \) (x was climbing the walls of the garden))]]

b. *[s0 (CAREFUL, Max) [sl (PROBABLE, speaker) (Max, \( \lambda x \) (x was climbing the walls of the garden))]]

(45b) violates the Scope Hierarchy. This is because, in (46b), s0 scope precedes sl scope. (46a) is acceptable, since sl scope precedes s0 scope.

3.1.3. Some Problems of the Interpretation Rules

What we have seen so far is two attempts at investigating into the constraints on sentence adverbs in terms of the interpretation rules. Some problems,
however, lie in these proposals. In the remainder of this section I shall discuss the problems.

The first problem is about their classification. I proposed four classes of sentence adverbs, while Jackendoff and Abe offer only two classes. Furthermore, they regard as sentence adverbs some items which are excluded from sentence adverbs in 2.3. Secondly, they discussed the co-occurrence constraints in terms of the bipartite classification, although I proposed that four classes differ from each other in their manner of occurrence and co-occurrence.

The third problem is about the incompatibility with questions. Jackendoff states that 'semantic effect' in subject-aux inversion creates the incompatibility, but he does not advance his arguments about it. In Abe's remark, questions are sl scope, so that sl scope adverbs (i.e. speaker-oriented adverbs) are incompatible with questions. However, he does not consider s0 scope adverbs (i.e. subject-oriented adverbs). According to his argument, if s0 scope adverbs (subject-oriented adverbs) follow questions (sl scope), the question sentences could be acceptable. My observation evidences, however, that sentence adverbs except Style are not compatible with questions. Therefore it seems that his argument is not correct. In addition, they fail to refer to Style.
The fourth problem is that sentence adverbs cannot occur in inverted sentences. Jackendoff does not look into the 'semantic effect', whereas Abe is concerned only with the inversion where a negation is preposed. His observations do not give us any explanations about (2lb) (repeated here as (47)):

\[(47) = (2lb) ??So fast did Tom probably run that he got to Texas in ten minutes.\]

Finally, Abe only describes the scope hierarchy of sentence adverbs, negation, etc. He does not offer the reason why such hierarchy exists.

3.2. Approaches of Modality
3.2.1. Nakau's Studies

The attempt by Nakau is different from those which have been introduced so far, because he considers sentence adverbs as 'modal expressions'. In the light of speech acts, he considers that a sentence is made up of 'modality' and 'proposition'. Before turning to his explanation of the constraints, it is helpful to see the definitions of modality and proposition. Proposition

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(propositional content) is the sentential element that a speaker presents as a real world situation (event, status, action, process, etc.) which exists in the objective world. Modality, on the other hand, is the sentential element that a speaker expresses as his/her mental attitude at the instant of the utterance; it is a subjective world for the speaker.

Nakau explicates the constraints in terms of the relation between the modal properties of sentence adverbs and those of sentence modality contained in a sentence. The term 'sentence modality' is explained by Nakau (1979) as follows. There are cases where a subject element and a predicate element form the modality such as declarative mood, interrogative mood and imperative mood; each sentence modality is generated by the way of combination of the subject and the predicate.

In terms of his classification of sentence adverbs, let us observe their properties of modality. They are shown in Table 2, which I made according to Nakau (1980).

Now let us look at his explanation about the constraints. He claims that the acceptability of a...
Table 2 The Properties of Sentence Adverbs by Nakau.

<table>
<thead>
<tr>
<th>Classes</th>
<th>The Properties of Modality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech-act (Style)</td>
<td>It expresses the speaker's way of presenting an utterance at the instant of making it. (i.e. It does not have to do with the propositional content.)</td>
</tr>
<tr>
<td>Truth-judgment (Truth-evaluating)</td>
<td>It expresses the assessment of the truth of the propositional content at the instant of the speaker's utterance. (i.e. It asserts the truth value of the propositional content.)</td>
</tr>
<tr>
<td>Value-judgment (Fact-evaluating)</td>
<td>It expresses the speaker's value judgment on the propositional content at the instant of his/her utterance. (i.e. It presupposes that the propositional content is true in order to make a value judgment.)</td>
</tr>
<tr>
<td>Subject-oriented value-judgment (Subject-evaluating)</td>
<td>It expresses the speaker's value judgment on the subject at the instant of his/her utterance. (i.e. It presupposes that the propositional content is true in order to make a value judgment.)</td>
</tr>
</tbody>
</table>

* The class names in the above column are used in Nakau (1980), which I translated into English; and the parenthesized names below are the ones which are adopted in this paper.

A sentence with a sentence adverb depends on the relation between modality of a sentence adverb and its sentence modality. In short, if the modality of a sentence adverb is compatible with the sentence modality, the sentence will be well-formed.

First, let us look at the constraints in questions. We can predict the acceptability of sentence adverbs with question sentences, by means of comparing the modality of
sentence adverbs with the sentence modality. That is to say, the comparison of the properties in Table 2 with the interrogative mood will clarify the acceptability. The property of the interrogative mood is that the speaker does not know whether the proposition is true, and he/she asks for the truth value.

If we compare the modality of Style with the interrogative mood, we cannot see any conflicts between them. The sentence is acceptable. It is possible to restrict the way of asking a question. The property of Style is to restrict the way of a speaker’s utterance, and interrogative mood is to ask whether the proposition is true or not. As for Truth-evaluating, it describes the truth value of the propositional content. Interrogative mood, on the other hand, assumes that the truth value of the proposition is not clear. Truth-evaluating indicates the truth value of the proposition, while interrogative mood does not indicate it. Hence a conflict is produced. Fact-evaluating and Subject-evaluating are not compatible with questions. It is because they presuppose that the propositional content is true, while the interrogative mood does not indicate its truth. These results are identical with my observation in the previous chapter.

1 Nakau, “Bun-fukushi” 200.
What about the constraints in tag questions? Modality of tag questions (falling tones) is 'a speaker's confirming attitude'. A tag question with a Truth-evaluating means a confirmation of the truth value of the propositional content. It creates no conflicts. Truth-evaluating expresses a speaker's assertion of the truth value, so that a tag question with it means a confirmation of a speaker's assertion of the truth value. A tag question with a Fact-evaluating or a Subject-evaluating creates a conflict, since both of them indicate that a speaker presuppose the truth of the propositional content. To 'presuppose' something means that the speaker is sure of it. It is strange for a speaker to confirm his/her belief which is self-evident. As for Style and Subject-evaluating, Nakau does not discuss them in his articles.

Now on inverted sentences, Nakau suggests that 'preposing' by inversion means a speaker's attitude of emphasis. Emphasis expresses a speaker's certainty.

Consider the following example:

\[(48) = (2b) \text{ b.}??\text{Never has Bill apparently seen}\]

---37---

---37---

1 Nakau, "Bun-fukushi" 176.
2 Nakau, "Bun-fukushi" 168.
3 Nakau, "Bun-fukushi" 199.
4 Nakau, "Bun-fukushi" 200.
anything to compare with that.

In (48), the incompatibility of a Truth-evaluating with an inverted sentence is caused by the conflict of the negative certainty of never (i.e. the modality of never preposing) with the modality of apparently (i.e. an assertion of the truth value 'apparent'). Next, let us take up his examples about Subject-evaluating ((49c) is not an inverted sentence, but it is unacceptable for the same reason):

(49) a. = (22c) *Not wisely did they accept the award.

b. = (22e) *Never did they wisely accept the award.

c. *None of them wisely accept the award.

He argues that the reason for the unacceptability of (49) is due to the negative scope. The negation in each sentence has wider scope than the modal expression wisely. It creates ill-formedness, since modal expressions cannot occur in the scope of negation. The reason is that the object of negation has to exist in a speaker's mind before his/her utterance. In his papers, the constraints on Style and Fact-evaluating are not examined.

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2 Nakau, “Bun-fukushi” 188.
3.2.2. Kasai’s Studies

Kasai has been dealing with ‘modality’ in a series of his works. He argues that sentence adverbs are ‘modal expressions’. His definition of modality and his account of the constraints are identical with Nakau’s, except that the scope of modal expressions in Kasai’s studies is wider than those in Nakau’s studies. He takes up thirteen categories as modal expressions. His fundamental remark is that ‘speaker’s mental attitude (i.e. modality) must be consistent’. It means that unless the combination of their modalities creates a conflict, a sentence adverb can occur with a sentence or with another sentence adverb. That is to say, his remark is in complete agreement with Nakau’s argument that the conflict between two kinds of modality produces an ill-formed sentence.

Let us now focus attention on his account of the


constraints. We will find here more developed arguments than Nakau's. The initial argument is about the constraints in inverted sentences. He argues that to change 'word order' expresses a speaker's mental attitude. 'Emphasis' urges a speaker to prepose a particular element. Inverted sentences are thus modal expressions. Nakau, as we have already seen, offers two distinct accounts of the constraints in inverted sentences. One is the same as Kasai's. Inverted sentences express a speaker’s emphasis. The other is not the same. Nakau argues that modal expressions must not be within the scope of negation. In the next chapter I will adopt Kasai’s argument that inverted sentences are modal expressions, so that the inconsistency in Nakau’s argument will be resolved. It does not mean, however, that I will not reject Nakau’s argument.

The second argument which Kasai developed is about the co-occurrence constraints. He tries to modify and improve the adverb hierarchy proposed by Nakajima (1982), because Nakajima’s hierarchy does not contain Style.

1 Kasai, “Shin-teki” 82.
2 Tamotsu Matsunami, Yoshihiko Ikegami and Kunihiko Imai, eds. (1983: 580-581) describes that Style is a member of Group-A; however, my observation shows that Style has wider scope than other adverbs.
Before turning to Kasai’s arguments, it is helpful to see Nakajima’s hierarchy. The following classes of adverbs are summarized by Kasai (1984) according to Nakajima (1982):

(50) a. Group-A: speaker’s attitude, opinion, judgement

fortunately, happily, sadly, surprisingly,
astonishingly, thankfully...

b. Group-B: probability of truth of proposition

probably, possibly, maybe, certainly, evidently, clearly...

c. Group-C: adverbs of time, frequency, manner, instrument, place, etc. are “restrictive adverbs” in the sense that they modify a whole V (or V’) and restrict the meaning of the VP.

d. Group-D: manner adverbs

The order (a) to (d) is the order of scope; Group-A has the widest scope, and Group-D has the narrowest. Here, I only focus attention on Group-A and B.

Although Style is not illustrated in (50), it has the widest scope as we have seen in Chapter 2. So Kasai (1984) discusses the scope of sentence adverbs in the light of modality. They have three classes: 1. the class concerning the truth of a proposition (i.e. Truth-evaluating), 2. the class about proposition excluding class 1 (i.e. Fact-evaluating), and 3. the class about the way to express the proposition (i.e. Style). These classes form the hierarchy, in which 3 is closest to the speaker, whereas 1 is closest to the proposition. The important point here is that his argument is further developed from Nakau's idea, in that he offers the explanation as to the co-occurrence constraints.

3.2.3. Some Problems of Modal Approaches

Many constraints on sentence adverbs have been explained by two approaches of modality (henceforth modal approach). It must be noted, however, that two approaches have some problems. I will here take up what are left unexplained.

First, there remain some constraints untouched. In Nakau's study, he does not touch upon the occurrences of Style and Subject-evaluating in tag questions, and Style

1 Kasai, "Shin-TEKI (2)" 133-134.
and Fact-evaluating in inverted sentences, while Kasai is concerned only with modal adverbs (i.e. Truth-evaluating).

Now, the second problem is the inconsistency found in Nakau's explanation. He provides two accounts of the occurrence constraints in inverted sentences. One is that the conflict between speaker's certainty shown in 'preposing' one particular element and modality of a sentence adverb creates unacceptability of the sentence. The other account is that since negation has wider scope than modal expressions (i.e. sentence adverbs), (49a) and (49b) are unacceptable. Kasai, on the other hand, arrives at the conclusion that a change of word order produces modality. This is identical with the former account by Nakau.

The third problem is that they do not account for the constraints in imperatives and optatives. The final problem is about the co-occurrence constraints. Nakau is not concerned with it, whereas Kasai proposes a modal hierarchy which is formed by Style, Fact-evaluating and Truth-evaluating. My observation, however, shows that sentence adverbs have four classes and that they form a hierarchy. That is, he does not deal with Subject-evaluating. These four problems are not discussed in their works. In the next chapter, they will be resolved by a more refined modal approach.
4. Modal Approach to the Constraints

4.1. Justification of Modal Approach

The attempt to regard sentence adverbs as modal expressions is made by not only Nakau and Kasai but also Lyons (1977). He takes up four sentence adverbs (i.e. frankly, fortunately, possibly, wisely), which correspond to my four classes of sentence adverbs, and describes that "they [sentence adverbs] are used by the speaker in order to express, parenthetically, his opinion or attitude towards the proposition that the sentence expresses or the situation that the proposition describes." ¹ 'Speaker's opinion or attitude towards the proposition' in his remark means modality, which will be defined in the next section.

Now let us discuss the reason why modal approach should be adopted. To begin with, we shall briefly look at the problems of the approaches of interpretation rules. First, I pointed out that they classified sentence adverbs into two classes, and that they discussed the co-occurrence constraints in terms of these two classes. However, this problem can be disregarded, since it is the


issue of definition of sentence adverbs. Next, on the constraint in questions, Jackendoff and Abe do not mention Style. In addition, Jackendoff does not inquire into the 'semantic effect'. Abe's argument, on the other hand, is misleading, because it makes us predict that subject-oriented adverbs are compatible with questions. As for the constraint in inverted sentences, Jackendoff does not look into the 'semantic effect', while Abe's attempt can apply only to the preposed negatives. Finally, Abe does not make any inquiries into The Scope Hierarchy.

These problems can be resolved by the modal approach. First, on the constraint in questions; as we have seen in the previous chapter, it can account for the constraints on Style and the 'semantic effect'. It indicates that 'semantic effect' is produced by modality (i.e. speaker's mental attitude), because the acceptability of the sentence with a sentence adverb depends on the relation between their modalities. The same is true of inverted sentences. Secondly, it can apply not only to sentences with preposed negation but to other inverted sentences. Here, I will not pursue the problem of co-occurrence constraints, because they will be resolved in 4.3.

It follows from the discussions above that the modal approach can explain the problems that the interpretation
rules cannot account for. I will adopt this approach, and refine it in order to resolve some problems with this approach in 4.3.

4.2. Definition of Modality

4.2.1. Definition of Modality

Before turning to a refined modal approach, I have to define modality and sentence modality. Palmer (1986) defines modality as follows:

Modalilty in language is, then, concerned with subjective characteristics of an utterance, and it could even be further argued that subjectivity is an essential criterion for modality. Modality could, that is to say, be defined as the grammaticalization of speakers' (subjective) attitudes and opinions.

In this quotation, 'speakers' (subjective) attitudes and opinions' is identical with 'speaker's mental attitude' advocated by Nakau and Kasai. Nakau (1979) defines it as a mental attitude of 'speaker' 'at the instant of his/her utterance'. The same holds true of Kasai (1986), as we have seen in 3.2.2. That is also supported by the study of Japanese modality in Masuoka (1991). These four

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scholars agree on the point of 'speaker's mental attitude'. Palmer, however, does not describe 'at the instant of speaker's utterance'.

Why is modality defined as expressions 'at the instant of the speaker's utterance'? Nakau (1979) describes that the mental attitude which does not involve the speaker's instantaneous present represents "the objective expression which the speaker considers to be far from himself/herself," and that it forms proposition. Kasai (1987) points out that "time expressions having no direct relations to the speaker's instantaneous present are the expressions in which the speaker considers himself/herself objectively." In this paper, their strict discrimination between modality and proposition is favorable to my arguments.

Besides that, one more discussion has to be given in this section, because there is a slight difference in the category of modality between Nakau, Kasai and Masuoka. Kasai (1987) points out that the categories of modality in Nakau's studies are modal auxiliaries, interjections, the phrases like 'I think', mood and adverbial expressions.

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1 Nakau, "Modariti" 229.
2 Kasai, "Shin-teki (5)" 57.
3 Kasai, "Shin-teki (5)" 58.
But as we have seen in 3.2.1, Nakau also regards as modal expressions inverted sentences (i.e. speaker’s mental attitude of certainty) and tag questions (i.e. speaker’s mental attitude of confirmation). On the other hand, Kasai (1987) adds to modal expressions the categories such as modal adjectives, stress, intonation, speech, word order, etc. Added to these, Masuoka (1991) classifies modality into two major categories: primary modality and secondary modality. He notes that primary modality is identical with the modality defined by Nakau, and that secondary modality covers the elements such as negation, tense and so on. The fuller study of these categories except negation lies outside the scope of this paper, so I will not pursue this question further. I will consider only Nakau’s categories as modality for the time being. There are two reasons for this. One is that his categories are taken over by Kasai and Masuoka; and the other is that they are sufficient for the study of sentence adverbs.

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1 Kasai, “Shin-teki (5)” 45-56.

2 Masuoka 45: note 12.

3 Masuoka (1991: 37) argues that secondary modality is the expressions in which a speaker can view objectively; it seems to be proposition according to Nakau’s definition.
As for the negation, it should be considered as proposition, as seen in 3.2.1, since the object of negation must be within the speaker’s mind before his/her utterance. Although I take Nakau’s position with reference to the definition and the categories of modality, I will adopt Kasai’s argument about the modality of word order and intonation. He describes that a change of word order itself creates modality. It advances Nakau’s argument, as was pointed out in 3.2.2. In addition, it can apply not only to (21a) but also (21b), although Abe’s proposal can only apply to (21a). On the other hand, it was implied by Nakau that intonation has modality, as we have seen in the discussion about tags.

4.2.2. Definition of Sentence Modality

In the remainder of this section, I will consider ‘sentence modality’. It is because the relation between the modality of sentence adverbs and that of sentences (i.e. sentence modality) accounts for the constraints. Sentence modality, as illustrated in Nakau’s quotation in 3.2, consists of subject and predicate. Halliday (1985) offers the same definition as Nakau: “Subject and Finite are closely linked together, and combine to form one constituent which we call the Mood.”

Then let us look into the types of sentence modality.
Palmer (1986) and Lyons (1977) considers declaratives, imperatives and interrogatives to be basic types of sentence modality. Halliday (1985) regards these three types of sentence modality and exlamatives as sentence modality. In addition to these four sentence modality, I will consider tag questions to be included in sentence modality, as we have seen in 3.2.1; and I will add optatives to sentence modality. It can be said that optatives express the modality of 'speaker's wish'.

4.3. A Refined Modal Approach to the Constraints

4.3.1. Criterion of Modality

Nakau and Kasai point out that a conflict between two kinds of modality causes unacceptability. It seems to be a filter which keeps out the sentences with inconsistent modality. Here I will summarize their arguments about the modality:

Criterion of Modality

The speaker's mental attitude (modality) must be

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1 Palmer 23-33; and Lyons 745.


3 Quirk, et al. (1985: 839) describes that the function of optatives is 'speaker's wish'.
consistent in his/her utterance and the attitude is to be at the instant of his/her utterance.

In what follows, I shall advance further the arguments (i.e. modal approach) about the constraints on sentence adverbs in terms of this criterion.

Although its validity for the constraints has been shown in this chapter, some problems that the modal approach has were pointed out in the previous chapter. The problems are as follows; complete explanations were not given on the occurrence constraints, and enough discussions were not offered on the co-occurrence constraints. In the remainder of this chapter, I shall refine the modal approach to resolve the problems.

4.3.2. The Constraints and the Criterion of Modality

Although the studies by Nakau and Kasai answer some questions of the constraints, there remain some untouched questions. In this section, I will verify my approach (the criterion of modality and the modal hierarchy), and answer the untouched questions.

To begin with, let us consider the constraints in tag questions. Nakau leaves two questions untouched: the constraints on Style and Subject-evaluating. First, consider the constraint on Style. A tag with a Style is acceptable, because a Style can restrict the way of
speakers’ confirmation. So my criterion is satisfied. The second question is about the constraint on Subject-evaluating. Table 2 (p.35) shows that it presupposes the truth of the propositional content. Thus it is strange for speakers to confirm the ‘presupposed’ truth, since the presupposed element indicates that he/she believes its truth; namely, the criterion of modality is not satisfied. The same is true of Fact-evaluating and Truth-evaluating.

Secondly, let us consider the constraints in inverted sentences. Nakau did not deal with Style and Fact-evaluating. However, if we compare the modality of inverted sentences with each modality of sentence adverb, it can be predicted that Style may occur in them, and that other sentence adverbs cannot occur. The reasons are as follows. The inverted sentences express modality whose function it is to emphasize the preposed element. On the other hand, Fact-evaluating and Subject-evaluating presuppose the truth of the proposition. The presupposed element can not be emphasized. So they cannot occur in inverted sentences; that is, my criterion is not satisfied. As for Truth-evaluating, it denotes the ‘assessment’ of the proposition in relation to the truth value which the speaker believes; whereas the preposed element in inverted sentences expresses the speaker’s ‘certainty’. So a conflict is produced. Next, on the
constraint on Style, it is not easy to occur in inverted sentences, because 'preposing' restricts the way to present the utterance (sentence). Preposing has the same function (property) as Style. Two categories which concern the restriction of the utterance can occur in the same utterance, which sometimes causes it difficult to judge the acceptability. If there is not any consistency between these two categories, it will be acceptable. I shall return to this point in 4.3.4.

Thirdly, consider the constraints in imperatives. Sentence adverbs other than Style cannot occur in imperatives, because there is a conflict between imperative mood and modality of a sentence adverb (except Style). Imperative mood denotes the modality of 'command', whereas sentence adverbs (except Style) indicates the modality of 'assessment' or 'value-judgment'. If they occur in the same utterance (sentence), it will be eliminated by my criterion, since they are in distinct modality. Now let us turn to Style. A Style in an imperative sentence (utterance) restricts the way to present the command sentence. We cannot see any conflict in that utterance.

Finally, let us look into the constraints in optatives. Its modality is the speaker's mental attitude of 'wish'. It differs from the speaker's mental attitude
of 'assessment' or 'value-judgment'. If an optative sentence has a sentence adverb (except Style), the sentence will have two distinct modality. Then it will be eliminated according to my criterion. As for Style, it seems to be difficult to judge the acceptability, as is shown by differences in the scholar's views. However, my criterion tells us that Style can occur in optatives unless two kinds of modality produce a conflict. Actually, it seems that (27) has no conflicts; in (27), honestly and truthfully are successful in restricting the way to express a wish 'God save him'. But (26) seems to have conflicts, because frankly and candidly seem to be incompatible with the speaker's 'wish'.

4.3.3. The Constraints and Modal Hierarchy

Now it remains to discuss the co-occurrence constraints. Kasai's modal approach to these constraints (1984) was shown in 3.2.2; but it did not deal with Subject-evaluating. My hierarchy (i.e. Fig. 4), on the other hand, incorporates Subject-evaluating as the narrowest scope. Fig. 4 shows that sentence adverbs form the hierarchy, whose order is 'from the element concerning the speaker to the one concerning the proposition', as was pointed out in 3.2.2. In this hierarchy, Style is the closest element to the speaker, while Subject-evaluating
is the closest element to the proposition.

Now I will combine this hierarchy with Table 1:

Table 3 The Constraints and the Relative Scopes

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Style</td>
<td>OK</td>
<td>OK</td>
<td>?</td>
<td>OK</td>
<td>OK?</td>
</tr>
<tr>
<td>Fact-evaluating</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Truth-evaluating</td>
<td>$</td>
<td>OK</td>
<td>$</td>
<td>$</td>
<td>$</td>
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<tr>
<td>Subject-evaluating</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

* sp = speaker

* pr = proposition

This diagram makes two points clear. The first point is that the closer an element is to the speaker, the wider the scope of the element is. Secondly, we can see the gap between Style and Fact-evaluating, because the behavior of Style differs from other sentence adverbs. In Table 3, a wavy line is drawn between them for the convenience' sake. It suggests that sentence modality is put between Style and Fact-evaluating. This is also concluded from the fact that Style can only occur at the initial positions of questions, imperatives and optatives. Greenbaum (1969) points out that Style may freely appear in front of questions, imperatives and optatives. In addition,
examples (6), (23) and (27) indicate that Style can occur at the initial position; while (51) and (52) show that it can not appear at other positions. Consider:

(51) *Did, frankly, Ron sell them fifteen chickens with no left wing?

(52) *Could Evan frankly have been at the coffee house all afternoon?

That is, Style has wider scope than sentence modality. To sum up: the modality of sentence adverbs and sentence modality form one hierarchy. The closer a modality is to the speaker, the wider its scope is. The closer a modality is to the proposition, the narrower its scope is. The reason why only Style can occur in front of questions, imperatives and optatives is that only Style has wider scope than sentence modality.

A similar view is proposed by Masuoka (1991). He describes the hierarchy of modality in his study of Japanese. It must be noted here that his study corroborates my argument that modality form a hierarchy.

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2 Konishi, ed. 747.

3 Masuoka 41-44.

4 Masuoka (1991: 10) describes that Japanese is so
4.3.4. A Further Explanation by the Modal Hierarchy

In this section, I will advance the argument as to the modal hierarchy. To make my argument more explicit, I will re-form the hierarchy into Fig. 5:

![Modal Hierarchy Diagram]

Fig. 5 provides a unified explanation for the two constraints on sentence adverbs. First, consider the occurrence constraints. Only Style can occur in sentences such as imperatives, questions and optatives; and it can appear only at the initial positions of these sentences. It is because it has wider scope than the sentence modality. Other sentence adverbs, on the other hand, can not appear in any sentence types other than declaratives, because they cannot have wider scope than sentence modality. Declaratives are modally unmarked, so that any modal expressions can appear in them. Therefore, such constraints can be predicted from Fig. 5.

highly structurized in modality that the study of Japanese modality can provide many suggestions for us.

1 Palmer 28-29.
There are, however, two problems about the constraints. One is about tag questions. The property of tags seems to be different from other sentence modality. Style and Truth-evaluating are compatible with tags, but others are not. It is because Fact-evaluating and Subject-evaluating presuppose the truth of the proposition. That is to say, they differ from others in the property (i.e. presupposition) of modality. My criterion of modality accounts for this difference. The other problem is about inverted sentences. They are not the same in kind as other sentence modalities that I defined before. They seem to restrict the way to present a sentence by means of 'preposing' in order to emphasize. Its function seems to be similar to that of Style rather than to that of sentence modality. It suggests that inverted sentences have the same rank as Style or the rank which is closer to the speaker than Style. As a consequence, Style may be difficult to occur in inverted sentences. As it is too involved a subject to be treated here in detail, I will not pursue this question further.

Secondly, let us look into the account of the co-occurrence constraints. Unless a narrower scope sentence adverb precedes a wider scope sentence adverb, it is acceptable. These constraints can be predicted from Fig. 8.
Conclusion

What I have discussed in this paper is the reason why sentence adverbs have some constraints on their occurrences. There are two types of constraints: occurrence constraints on sentence adverbs in different sentence types and co-occurrence constraints on sentence adverbs. In order to account for them, the notion of 'modality' was introduced: 'speaker's mental attitude in his/her utterance' at the instant of the utterance. Besides, it is pointed out that modality has two properties. One is that the modality must be consistent (criterion of modality), the other is that it forms a hierarchy (modal hierarchy).

The constraints in sentence types can be predicted from the modal hierarchy (Fig. 5). If the modality of a sentence adverb has wider scope than the modality of a sentence, it can occur in that sentence. If it has narrower, it cannot occur in that sentence. In addition, it can account for the fact that Style can occur only at initial positions of questions, imperatives and optatives. As for the co-occurrence constraints, my hierarchy accounts for the ordering of sentence adverbs in co-occurrence. If an adverb of wider scope in the hierarchy precedes an adverb of narrower scope, it will be
acceptable.

However, there remain some questions which this paper did not deal with. The first question is about the property of sentence adverbs in clauses. Sentence adverbs in subordinate clauses have some different properties, as is pointed out by Amano (1976) and Okada (1985). The next question is about the modality. Although I focused attention only on the modality of sentences and sentence adverbs, further discussions on them would be necessary. For example, secondary modality proposed by Masuoka (1991), modal adjectives, which Kasai considers as modality, and tense as modality. Furthermore, I have to look more closely into the constraints in tags and inverted sentences. Although there are some untouched questions, the approach in this paper (i.e. criterion of modality and modal hierarchy) could not be denied. I would like to continue to investigate into them further.
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Abstract

It is well-known fact of English that sentence adverbs have several constraints on their occurrences. The purpose of this paper is to look into the reasons for their constraints.

Before turning to the investigation into the constraints, I divide sentence adverbs into Style (e.g. frankly, seriously), Fact-evaluating (e.g. fortunately, luckily), Truth-evaluating (e.g. obviously, probably) and Subject-evaluating (e.g. cleverly, foolishly), according to the studies of Quirk et al. (1985), Declerck (1991) and Nakau (1980).

In terms of the classification above, I examined the occurrences and the co-occurrences of sentence adverbs. The results of my examination into the occurrence constraints are as follows. Style can occur in questions and imperatives, whereas other sentence adverbs cannot occur in such sentences. Style and Truth-evaluating can appear in tags (falling tones), while other sentence adverbs cannot. Style is difficult to appear in inverted sentences, while others cannot. Finally, in optatives, many Style can occur, whereas others cannot. As for the co-occurrence constraints, these four classes of sentence adverbs form a scope hierarchy. The order is Style, Fact-
evaluating, Truth-evaluating and Subject-evaluating (Style has the widest scope, and Subject-evaluating has the narrowest).

There are two main positions on these constraints: approaches by interpretation rules and approaches of modality. Jackendoff (1972) and Abe (1980) try to account for the constraints by means of interpretation rules, but their attempts have some problems.

Lyons (1977), Nakau (1980) and Kasai (in a series of his studies), on the other hand, consider sentence adverbs to be modal expressions. This position was advanced further by Nakau and Kasai, and their attempts seem to provide a better explanation than the former approaches. They argue that a sentence is made up of 'modality' and 'proposition', and that the constraints can be explained according to the relation between modality of sentence adverbs and modality of sentences. If there is a conflict between these two kinds of modality, the sentence is not acceptable; because modality must be consistent in an utterance.

The accounts of the modal approach are as follows. The reason for the appearances of Style in questions, tags, imperatives and optatives is due to the property that Style is not concerned with the propositional content. The reason for the non-appearances of other
sentence adverbs is due to a conflict between the modality of each class of sentence adverbs and the modality of each sentence type. As for the co-occurrence constraints, Kasai argues that sentence adverbs form a modal hierarchy; in which, the widest scope is the closest to 'speaker', and the narrowest is the closest to 'proposition'. Although their attempts provide a better explanation, they have some problems. The main problems are as follows. First, there remain some constraints which they do not account for. Secondly, the account of the constraints in inverted sentences is not completed. Finally, Kasai's modal hierarchy does not include Subject-evaluating.

In order to overcome the problems above, I will refine their approaches. 'Criterion of modality' and 'modal hierarchy' will be provided. The criterion of modality is that speaker's mental attitude must be consistent in the utterance. This criterion is a filter that keeps out a sentence with inconsistent modality. It seems to be successful in accounting for the constraints that Nakau and Kasai do not account for.

The co-occurrence constraints will be explained by the modal hierarchy formed by modality of Style, sentence, Fact-evaluating, Truth-evaluating and Subject-evaluating (they are the scope order). A sentence with two sentence adverbs is acceptable unless a narrower scope sentence
adverb appear before a wider scope sentence adverb. The points are that the wider a scope is, the closer it is to 'speaker', and that the narrower a scope is, the closer it is to 'proposition'. This hierarchy differs from Kasai's in that Subject-evaluating and sentence modality (modality of sentences such as imperative mood, interrogative mood, etc.) are indicated.

This hierarchy, furthermore, will advance the account of the constraints. First, whether a sentence adverb can occur in a sentence depends on whether the modality of sentence adverb has wider scope than the sentence modality. Secondly, a fact that Style can occur only at initial positions of questions, imperatives and optatives is explained by this hierarchy, since Style must have wider scope than sentence modality. Declaratives are modally unmarked (as was pointed out by Palmer (1986)), so that sentence adverbs can appear at any positions. Thus my refined approach will provide a better explanation.