

# A Focus-Based Approach to Scope Ambiguity in Japanese

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## Abstract

This paper puts forward an analysis of scope interactions between Japanese adverbial quantifiers like *mainichi* 'everyday' and *tokidoki* 'sometimes' and a negative morpheme *nai* 'not' on the basis of f(ocus)-structures. In this analysis, three f-structures are assigned to a sentence with an adverbial quantifier and a negative morpheme. One of them represents a negation-wide reading, and the other two represent quantifier-wide readings. Some f-structures, however, are unacceptable due to semantic or pragmatic factors. Different scope behaviors of the two quantifiers mentioned above can then be ascribed to acceptability of f-structures.

## 1 The Objective

This paper mainly concerns with the following pairs of Japanese negative sentences.

- (1) a. Taro-wa mainichi gakko-ni ika-nai  
Taro-TOP everyday school-TO go-not
- b. Taro-wa mainichi-wa gakko-ni ika-nai  
Taro-TOP everyday-TOP school-TO go-not  
'Taro does not go to school everyday'
- (2) a. Taro-wa tokidoki gakko-ni ika-nai  
Taro-TOP sometimes school-TO go-not
- b. Taro-wa tokidoki-wa gakko-ni ika-nai  
Taro-TOP sometimes-TOP school-TO go-not  
'Taro sometimes does not go to school'

All of these four sentences contain a frequency quantifier (*mainich* 'everyday'/*tokidoki* 'sometimes') and a negative morpheme (*nai* 'not'). (b) sentences in these pairs differ from (a) sentences in that the adverbial quantifiers that appear in them are marked by a topic marker *wa*. There are two potential interpretations for these sentences: one in which the adverbial quantifier takes the wider scope than the negative morpheme, and one in which the scope relationship is reversed. I will henceforth call the former reading *QN reading* and the latter *NQ reading*.

What is interesting concerning these sentences is the following contrast. Both sentences in (2) are invariably interpreted as QN, while the (1b) is invariably NQ. Judgments on (1a) are controversial. The QN reading is the dominant reading and, in addition, it is even the only reading available for some speakers. Nonetheless, other speakers do admit the NQ reading for (1a). These facts can be summarized as in the following table.

(3)	(a) Q	(b) Q+wa
(1) <i>mainichi</i>	QN ?*NQ	*QN NQ
(2) <i>tokidoki</i>	QN *NQ	QN *NQ

We could dismiss the NQ reading of (1a) as simply ungrammatical given its marginal status. This approach, however, leaves the difference of NQ acceptability between (1a) and (2a) unexplained; the NQ reading is totally unavailable in the case of (2a), while some people accept the NQ reading for (1a).

Furthermore, there are some constructions where NQ readings seem to be relatively easier for universal quantifiers without a topic marker *wa*.

- (4) a. *mainichi tsudzuka-nai*  
 everyday continue-not  
 '(it) does not continue everyday.'
- b. *mainichi onaji huku-o ki-nai*  
 everyday same clothes-ACC wear-not  
 '(he) does not wear the same dress everyday.' ((Kudo, 2000))
- (5) a. *zen'in-ga mada kite-i-masen*  
 everyone-NOM yet come-BE-not  
 'Not all the members have come yet.' ((Kato, 1985))
- b. *subete-o ii-kira-nai-ga ...*  
 all-ACC say-PERF-not-BUT  
 'Although I have not say all...' ((Kato, 1989))

In (4), the verb *tsudzuku* 'continue' or the adjective *onaji* 'same' indicate that more than one day are involved, and hence NQ readings are facilitated. In (5), likewise, the verbs are in some kind of perfective form, suggesting that more than one thing are involved. As long as such examples exist, we may conclude that both readings are available to (1a) but withdrawn for some reasons.

Accepting two scope possibilities for (1a) naturally poses several questions. (1) How should the two readings be represented theoretically? (2) Why is the QN reading not available to (1b)? (3) Why can the sentences in (2) only have QN readings?

In section 2, we will review some of the previous studies of the scope of Japanese negative morpheme *nai*, and see what is problematic to them. In section 3, I will set out my assumptions about Japanese simple sentences based on the f-structure analysis of (Erteschik-Shir, 1997). In section 4, I will show that scope ambiguity is made possible by the f-structures defined in section 3. In section 5, (Büring, 1997)'s analysis is applied to Japanese to rule out the readings for contrasted universal quantifiers. In section 6, unavailability of NQ readings for existential quantifiers like *sometimes* is explained on the basis of f-structures proposed here.

## 2 Problems concerning the Scope Negation in Japanese

In this section, we will briefly review some of the previous studies concerning the scope of the negative morpheme *nai* in Japanese.

(Kuno, 1980) argues that the scope of *nai* is limited to the verbal it is attached to on the basis of the difference between (6a) and (6b).

- (6) a. ?Shekusupia-wa 1564-nen-ni umare-nakat-ta  
 Shakespeare-TOP the year 1564-IN be born-not-PAST  
 'Shakespeare was not born in 1564.'
- b. Shekusupia-wa 1564-nen-ni umare-ta no de wa nai  
 Shakespeare-TOP the year 1564-IN be born-PAST NOML COP TOP not  
 'It is not the case that Shakespeare was born in 1564.'

In a simple sentence in (6a), Kuno argues the scope of *nai* is the verb *umare(ru)* 'be born' and therefore *1564-nen-ni* 'in 1564' cannot be negated. So understood, (6a) means something like 'What Shakespeare did in 1564 was not to be born,' which sounds peculiar. In (6b), in contrast, *1564-nen-ni umare-ta* is in the embedded clause marked by the nominalizer *no*. Furthermore, this embedded clause and the copula *de(su)* following it together form a verbal phrase to which the negative morpheme is attached. Hence, in (6b), *1564-nen-ni* lies within the scope of *nai*. (6a) may mean 'It is not in 1564 that Shakespeare was born.'

It is plain to see that this analysis cannot account for the NQ readings of the sentences in (1), because the quantifier *mainichi* must be outside the scope of the negative morpheme in both sentences. In fact, Kuno adds an exception clause which stipulates that quantifiers may be in the scope of the negative morpheme. Given that NQ readings are available for some sentences, Kuno's definition of the scope of *nai* is inadequate.

(Yatabe, 1996), criticizing Kuno's definition, argues that the scope of *nai* is what he calls "infinitival portion", which is roughly equivalent to a VP under the VP-internal subject hypothesis. He further adds the following hypothesis about negative sentences in Japanese.

- (7) The "infinitival portion" of a sentence is not a syntactic constituent and hence cannot serve as the scope of a focused expression.

Given this hypothesis, (8) may be analyzed as follows.

- (8) Shekusupia-wa [1564-nen-ni]<sub>F</sub> [umare-nakat-ta]

The underlined parts form the infinitival portion of the sentence, but they do not form a single constituent. *1564-nen-ni*, being focused (in this case), must be associated with a scope, which cannot be the infinitival portion as stated in (7). The scope of the focused phrase therefore must be the matrix clause. The scope of the negative morpheme, on the other hand, is the infinitival portion, as mentioned above. Thus the focused phrase ends up outside the scope of the negative operator.

Quantifiers, like focused phrases, are expressions for which the scope must be determined, and therefore must necessarily take a wider scope than the negative operator. We must conclude, then, that NQ readings are unavailable at all, contrary to the fact. As regards this problem, Yatabe claims that *zen'in* in (9), which is ambiguous, is not a quantifier, but a plural noun phrase.

- (9) gakusei-ga zen'in ko-nakat-ta (koto)  
 student-NOM all come-not-PAST (fact)  
 '(the fact that)none of the students came'  
 '(the fact that) not all the students came'

I agree that when a subpart of sentence is focused (on its own), the result is what is called *exhaustive reading* and the focused phrase is interpreted outside the scope of the negative operator. However, not all instances of what is normally assumed to be a focus escape from the effect of the negative operator. *mainichi-wa* in (1b), for instance, is a so-called contrastive topic,

which is presumably focused. Yet it *is* negated in (1b). This means that a focused phrase is not necessarily interpreted outside the scope of a negative operator.

In (Kato, 1985), a focused phrase is first raised and adjoined to an S-node. At this point, there are two landing sites for a negative operator: the higher and lower S.

(10) [<sub>S1</sub>[F] [<sub>S2</sub>...NEG]]

If the negative operator is raised up to the higher S, it outscopes the focused phrase. In this case, the negative operator is interpreted as part of assertion. If it is raised to the lower S, it is outscoped by the focused phrase, and is interpreted as part of presupposition. (Kato, 1985) calls the first reading, NEG-A (negative assertion), and the second, NEG-P (negative presupposition). In Kato's system, we may conclude that any phrase that is capable of being focused may be negated.

(Kuno, 1977) observes that subjects (marked by *ga*) in Japanese sentences cannot be negated by a negative morpheme.

(11) a. Taro-ga Kobe-ni it-ta  
Taro-NOM Kobe-TO go-PAST  
'Taro went to Kobe.'

b. \*iya, Taro-ga ika-nakat-ta  
no Taro-NOM go-not-PAST  
'No, Taro didn't go (to Kobe).'

c. iya, Taro-wa ika-nakat-ta  
no Taro-TOP go-not-PAST

(11b) is not acceptable as a reaction to someone's utterance of (11a). An appropriate rejection of (11a) may be (11c), where the subject is marked by topic marker *wa*.

Likewise, (Homma, 1998) cites (12) as an example that is hardly understood to have an NQ reading even for those who admit NQ readings for negative sentences with universally quantified objects.

(12) Subete-no hito-ga Taro-o seme-nakat-ta  
all-of person-NOM Taro-ACC blame-not-PAST  
'All the people didn't blame Taro.'

Kato tries to explain the inadequacy of (11b) by appealing to some pragmatic factors. (11b), he claims, must have an exhaustive listing (EL) interpretation due to its contextual environment. EL interpretation, in turn, requires the assertion should be positive, favoring the NEG-P reading.

If Kato is correct, we would not expect asymmetry between the nominative marker *ga* and other case markers such as *o*, *ni*, etc. because EL reading is not limited to noun phrases marked by *ga*. This expectation is not born out. Consider the following example, again cited from (Kuno, 1977).

(13) a. Taro-wa Hanako-o nagut-ta  
Taro-TOP Hanako-ACC hit-PAST  
'Taro hit Hanako.'

b. Iya, Taro-wa Hanako-o nagura-nakat-ta  
no Taro-TOP Hanako-ACC hit-not-PAST  
'No, Taro didn't hit Hanako.'

In contrast to (11), (13b) is not so bad a reaction, if not a perfect one, to (13a).

To summarise, we reviewed three previous proposals for the scope of a Japanese negative morpheme *nai* in this section. It is quite obvious that (Kuno, 1980)'s definition of the scope of the negative morpheme is too narrow for our purpose. We must therefore seek a definition that provides a broad enough scope for the negative morpheme. Once the scope is broadened, focused phrases must be raised out of the scope to account for the exhaustive reading. But not all focused phrases have to be excluded from the scope. Conversely, capability of being focused does not necessarily involve capability of being negated. We may reconcile these problems by distinguishing two types of foci: one that is associated with assertion, and the other, associated with negation.

### 3 The Focus Structures of Japanese Sentences

#### 3.1 F-Structures for Basic Sentences

In this section, I will briefly review (Erteschik-Shir, 1997), and present my basic assumptions about the focus structures of Japanese sentences.

Such distinctions as 'topic vs comment', 'background vs focus', and 'new vs old information' are widely recognized to be essential for analyzing the meanings of sentences from the viewpoint of discourse. (Erteschik-Shir, 1997) posits a level at which a structure where topics and foci are perspicuously marked is generated. Such a structure is called *f(ocus)-structure*. The sentence in (14), for example, may correspond to five different f-structures listed in (15). Each of these f-structures is appropriate as an answer to the question shown below it.

(14) The children ate the candy

- (15) a. [The children]<sub>TOP</sub> [ate the candy]<sub>FOC</sub>  
(What did the children do?)
- b. [The children]<sub>TOP</sub> ate [the candy]<sub>FOC</sub>  
(What did the children eat?)
- c. TOP<sub>i</sub>[The children ate [the candy]<sub>i</sub>]<sub>FOC</sub>  
(What happened to the candy?)
- d. TOP<sub>i</sub>[[The children]<sub>FOC</sub> ate [the candy]<sub>i</sub>]  
(Who ate the candy?)
- e. sTOP<sub>t</sub>[The children ate the candy]<sub>FOC</sub>  
(What happened?)

In Erteschik-Shir's system, every sentence is required to have a topic. It may be an overt constituent as in (15a-d), or sTOP<sub>t</sub>, what she calls *stage topic*, as in (15e). Stage topics correspond to spatio-temporal arguments in (Kratzer, 1989), and therefore are available only to stage-level predicates. In (15e), the whole sentence is the focus and no overt constituent serves as a topic. The predicate of this sentence, namely *eat*, is a stage-level predicate and can make use of a stage topic. When the predicate is an individual-level predicate, one of its arguments must stand as a topic, since, unlike stage-level predicates, stage topics are not available. (16a) is illegitimate and (16b) is the only possible f-structure for the sentence *Firemen are altruistic*.

- (16) a. \*sTOP<sub>t</sub>[Firemen are altruistic]<sub>FOC</sub>
- b. [Firemen]<sub>TOP</sub> [are altruistic]<sub>FOC</sub>

The difference between (15a) and (15e) is also related to the distinction made by (Kuroda, 1972): that of *thetic* and *categorical* judgment. The thetic judgment 'represents simply the recognition or rejection of material of a judgment.' The categorical judgment, on the other hand, 'is assumed to consist of two separate act, one, the act of recognition of that which is to be made the subject, and the other, the act of affirming or denying what is expressed by the predicate about the subject.' The difference between the thetic and categorical judgments can, Kuroda claims, be represented by the difference between the particles *ga* (nominative marker) and *wa* (topic marker) in Japanese.

(17) a. Inu-ga hashit-teiru  
 dog-NOM run-PROG  
 'A/The dog is running.'

b. Inu-wa hashit-teiru  
 dog-TOP run-PROG  
 'The dog is running.'

(17a), on one hand, represents a simple recognition of an event of a dog's running. In (17b), on the other hand, we first direct our attention to a (familiar) dog, and then recognize a property (that is, be running) of that dog.

In (Erteschik-Shir, 1997)'s terms, the f-structures for these sentences may be represented as follows.

(18) a. sTOP<sub>i</sub>[inu-ga hashit-teiru]<sub>FOC</sub>

b. [inu-wa]<sub>TOP</sub> [hashit-teiru]<sub>FOC</sub>

Given the unavailability of stage topics to non-stage-level predicates, we may expect that generic sentences with *ga*-marked subjects is unacceptable. Consider the following.

(19) a. ??Inu-ga hashiru  
 dog-NOM run  
 'Dogs run.'

b. Inu-wa hasiru  
 dog-TOP run

While (19b) is a natural sentence that reports dogs' habit of running, (19a) is not natural as an independent sentence. (19a), however, can be acceptable when it is embedded in a subordinate clause, or the subject is focused. In the latter case, exhaustive reading is obtained. The exhaustive reading of (19a) may then be represented by the following f-structure.

(20) [Inu-ga]<sub>FOC</sub> hashiru  
 'It is dogs that run.'

Note that there is no topic in (20). Firstly, there is no noun phrase other than *inu*, and secondly the topic, if any, might not be the stage topic since the sentence is generic. Therefore I do not know what counts as the topic of (20) at the moment. I will tentatively accept f-structures like (20) as legitimate. This f-structure may be interpreted a la (Jackendoff, 1972) as follows.

- (21) a. Presupposition:  $\exists x.run(x)$ .<sup>1</sup>  
 b. Assertion:  $\{dogs\} = \lambda x.run(x)$

A question arises as to whether (20) is a categorical judgment or not. Kuroda notes ‘a wh-interrogative sentence of the generic type may be made in noncategorical subjectless form, provided that the syntactic subject is a wh-word.’ This conclusion is drawn from his hypothesis that Japanese particles *wa* and *ga* reflect the categorical and thethetic judgements respectively. However, we can maintain that the logical subject of (20) is covert and not pronounced. I have no idea what that logical subject is and how it should be represented, but given its quasi-synonymous translation ‘It’s dogs that run’, it may not be so unfounded to categorize (20) as a categorical judgment.

Another interesting observation made by (Kuroda, 1972) is the difference between (22a) and (22b).

- (22) a. ??Fido-ga [neko-o]<sub>FOC</sub> oikakeru  
 Fido-NOM cat-ACC chase  
 ‘Fido chases cats.’  
 b. Fido-wa [neko-o]<sub>FOC</sub> oikakeru  
 Fido-TOP cat-ACC chase

We cannot focus the object *neko-o* in (22a). If we want to place focus on the object, we must topicalize the syntactic subject *Fido* as in (22b). Recall that we assumed that the f-structure in (20), in which the syntactic subject is focused, is a categorical sentence. From these observations, I set up the following hypotheses.

- (23) a. Narrow foci can occur only in categorical sentences.  
 b. If the subject is marked by the nominative marker *ga* and is not a focus on its own, the sentence expresses a thetic judgment.

### 3.2 Negative Sentences and Focus Structures

(Erteschik-Shir, 1997) gives the following f-structure for the sentence *John didn’t eat the pizza*.

- (24) [John]<sub>TOP</sub> [didn’t eat [ [ [the pizza]<sub>FOC</sub> ] ] ] ]<sub>FOC</sub><sup>2</sup>  
 [ [ delicacy<sub>1</sub> ] ]  
 [ [ delicacy<sub>2</sub> ] ]  
 [ [ : ] ]  
 ]<sub>TOP</sub>

Note that there are two foci and two topics in this structure. In addition, one of the foci is embedded in the other. The former is called *subordinate focus*. I will refer to the latter focus as *the main focus*.

<sup>1</sup>(Jackendoff, 1972) rejects existential presuppositions, and adopts a function-under-discussion approach in order to avoid contradiction that might be caused by sentences like **NOBODY** likes Bill, where *nobody* is focused. According to (Herburger, 2000), however, the following sentence has an existential presupposition that someone likes Bill.

- i. **MANY OF HIS COLLEGUES** likes Bill

She concludes that whether the focused quantifier is decreasing or not is involved in the determination of presuppositions. Following Herburger, I adopt existential presuppositions for non-negative phrases. This assumption about presuppositions is particularly crucial in the discussion given in section 6

<sup>2</sup>To be precise, the negated auxiliary verb *didn’t* is not included in the main focus in Erteschik-Shir’s analysis. In the intended reading, in contrast to the free reading that will be introduced just below, the negative operator forms a part of assertion. Thus I believe it is more appropriate, for the purpose of distinguishing these two readings, to include the negated auxiliary verb in the main focus.

The f-structure in (24) represents a reading which is called *bound reading* in (Herburger, 2000)'s terminology. The bound reading may be interpreted as follows.

- (25) a. Presupposition:  $\exists x.[eat(j, x)]$ .  
 b. Assertion: the pizza  $\notin \lambda x.[eat(j, x)]$

(Herburger, 2000) distinguishes another reading for a negative sentence, namely a *free reading*. I propose the free reading of this sentence is represented by the f-structure in (26), whose interpretation will be (27).

(26) [John]<sub>TOP</sub> didn't eat [the pizza]<sub>FOC</sub>

- (27) a. Presupposition:  $\exists x.[\sim eat(j, x)]$ .  
 b. Assertion: {the pizza} =  $\lambda x.[\sim eat(j, x)]$

These two readings may well be translated into the following Japanese. Note that in the free reading, the object is marked by accusative case *o*, while in the bound reading it is marked by *wa*.

- (28) a. [John-wa]<sub>TOP</sub> [pizza-o]<sub>FOC</sub> tabe-nakat-ta (free reading)  
 John-TOP pizza-ACC eat-not-PAST  
 b. [John-wa]<sub>TOP</sub> [[pizza-wa]<sub>FOC</sub> tabe-nakat-ta]<sub>FOC</sub> (bound reading)  
 John-TOP pizza-TOP eat-not-PAST

At this point, I set up two hypotheses in addition to (23).

- (29) a. If a negated verb heads the main focus, the scope of the negative operator is the main focus.  
 b. The target of negation is marked by a subordinate focus.

## 4 Quantifiers and Negation

### 4.1 Ambiguity of Universally Quantified Negative Sentences

In the previous section, we posited two f-structures for a negative sentence.

- (30) a. [John]<sub>TOP</sub> [didn't eat [the pizza]<sub>FOC</sub>]<sub>FOC</sub>  
 b. [John]<sub>TOP</sub> didn't eat [the pizza]<sub>FOC</sub>

Turning back to the sentences in (1), then, we may expect the following f-structures.

- (31) a. [Taro-wa]<sub>TOP</sub> [mainichi(-wa)]<sub>FOC</sub> gakko-ni ika-nai  
 b. [Taro-wa]<sub>TOP</sub> [[mainichi(-wa)]<sub>FOC</sub> gakko-ni ika-nai]<sub>FOC</sub>

The first structure presupposes that there are days when Taro does not go to school, and asserts that everyday is such a day. Therefore (31a) represents a QN reading. On the other hand, (31b) presupposes that there are days when Taro goes to school, and asserts that it is not everyday. This represents the NQ reading. In addition to these two f-structures, (32a) is also possible. Since the scope of the negative operator is restricted to the main focus, it cannot negate *mainichi*, which resides outside the main focus. This f-structure says that not to go to school is one of the things Taro does everyday.

- (32) a. [Taro-wa]<sub>TOP</sub> mainichi [gakko-ni ika-nai]<sub>FOC</sub>  
 b. Presupposition:  $\exists P[everyday(P(t))]$   
 Assertion: *not go to school*  $\in \lambda P[everyday(P(t))]$



## 4.2 Subjects and Negation

Recall that it is difficult to interpret (12) as NQ, even for those who accept the NQ reading of (1a). In this section, we will see how this fact might be incorporated into our analysis.

(Teramura, 1979) and (Nitta, 1991) observes that negative sentences with *ga*-marked subjects are not natural in ordinary situations.<sup>3</sup>

- (33) ??Ame-ga hut-tei-nai  
rain-NOM fall-PROG-not  
'It is not raining.'

Likewise, (Erteschik-Shir, 1997) notes that negative sentences with stage topics are generally blocked and limited to a small number of predicates.

- (34) ??sTOP<sub>i</sub>[The United States didn't evade Iraq]<sub>FOC</sub>

While it is not entirely clear why these sentences are anomalous, it seems that, as (Nitta, 1991) comments, a negativethetic sentence like (33) requires its positive counter part (an event of raining, for example) to be taken for granted. Therefore I assume that only when a certain kind of condition is satisfied can a negativethetic sentence be acceptable.

Let us now consider the two potential f-structures for (12) in (35).

- (35) a. ??sTOP<sub>i</sub>[subete-no hito-ga Taro-o seme-nakat-ta]<sub>FOC</sub>  
b. [subete-no hito-ga]<sub>FOC</sub> Taro-o seme-nakat-ta

(35a) is thethetic reading and corresponds to the NQ reading. We have just claimed, however, that negativethetic sentences are generally anomalous. Thus, (35a) is not an acceptable f-structure in a normal situation.

(35b), on the other hand, is a legitimate one. Its presupposition is that there are some people who blamed Taro, and asserts that everybody is one of them. That is, (35b) represents the QN reading.

## 5 Contrastive Topics and Scales

From the discussion given in the previous section, we may conclude that (1b) must be ambiguous, which is not the case as we saw in the first section. This problem can be solved by simply adopting the analyses proposed by (Büring, 1997) and (Kaga, 1997). (Büring, 1997) introduces a third type of semantic value which he calls *topic value*, in addition to the ordinary value and the focus value of (Rooth, 1985).

The topic value of a sentence *S* is a set of sets of propositions. Each set in the topic value is the focus value of a sentence *S'* obtained from *S* by replacing the topic with one of its alternatives. Suppose that the alternatives of *John* are *John*, *Bill*, and *Tom* and the alternatives of *Mary* are *Mary*, *Nancy*, and *Elizabeth*. Then the topic value of the sentence (36a) is (36b).

- (36) a. [John]<sub>TOP</sub> likes [Mary]<sub>FOC</sub>  
b.  $\{\{like(j, m), like(j, n), like(j, e)\}, \{like(b, m), like(b, n), like(b, e)\},$   
 $\{like(t, m), like(t, n), like(t, e)\}\}$

<sup>3</sup>More precisely, (Teramura, 1979) and (Nitta, 1991) observe that negated counterpart of what they call *phenomenon sentences* is in general anomalous. Phenomenon sentences are ones that describe a phenomenon that occur at a time and space as it is, without subjectivity. I suppose phenomenon sentences largely correspond to sentences that express athetic judgment.

(Büring, 1997) maintains that a use of a topic requires there to be an issue left open, what he calls *residual topic* or *disputable question*, after the sentence is uttered. A residual topic must be one of the members in the topic value. In the example above, the residual topic must be *whom Bill likes* (the second member in (36b)) or *whom Tom likes* (the third member).

Büring makes use of such notions as *topic value* and *residual topic* and explains the unavailability of the QN reading of (37), where the quantifier *alle* 'all' is a topic.

- (37) [Alle]<sub>TOP</sub> Politiker sind nicht [korrupt]<sub>FOC</sub>  
 all politicians are not corrupt  
 'All politicians are not corrupt.'

Suppose that the QN reading of (37) were chosen. Then, its topic value might be (38a). Alternatives of *all* are assumed to be *all*, *most*, *some*, and *one*, which constitute a scale in (38b) ordered by implication relation.

- (38) a.  $\{\{all(politicians)(\lambda x.[corrupt(x)]), all(politicians)(\lambda x.[\sim corrupt(x)])\},$   
 $\{most(politicians)(\lambda x.[corrupt(x)]), most(politicians)(\lambda x.[\sim corrupt(x)])\},$   
 $\{some(politicians)(\lambda x.[corrupt(x)]), some(politicians)(\lambda x.[\sim corrupt(x)])\},$   
 $\{one(politicians)(\lambda x.[corrupt(x)]), one(politicians)(\lambda x.[\sim corrupt(x)])\}\}$   
 b. *all* > *most* > *some* > *one*

One of the issues in (38a) must be disputable because of the requirement for residual topics. Given the implication relation in (38b), however, none of the issues is disputable. Since we know that each of the politicians are not corrupt, we know that most of the politicians are not corrupt, some of the politicians are not corrupt, and so on. That is, the QN reading of (37) cannot satisfy the requirement for a disputable issue.

As for the NQ reading, on the other, no such inconvenience occurs. Even if we know that not all of the politicians are corrupt, the issue whether or not most politicians are corrupt, for example, is still disputable. Therefore, Büring concludes, only the NQ reading survives.

Exactly the same explanation can be applied to the Japanese sentence in (1b). (Kaga, 1997) independently proposes an analysis similar in vein. *mainichi* in (1b) which is marked by the topic marker *wa* (and is focused) is a so-called *contrastive topic*. Therefore *mainichi-wa* requires a disputable issue obtained by replacing *mainichi* with an alternative frequency adverb. The QN reading of (1b) cannot satisfy this requirement and is thereby discarded.

A remaining problem concerning (1) is why the QN reading is dominant in (1a). We may have recourse to blocking effect in this respect. Firstly, I suppose that *mainichi* in (31b) is not so markedly stressed because it is only a subordinate focus. Then, this f-structure cannot be easily distinguished on phonological ground from the f-structure in (32a), which represents a QN reading. If *mainichi* is marked by *wa*, however, the sentence receives unambiguously the NQ interpretation. So, if the speaker intends to express the NQ reading, (s)he may have used unambiguous sentence in (1b) instead of (1a).

## 6 Affirmative Polarity Items and F-Structures

We assumed three f-structures for sentences in (1) so that both NQ and QN readings may be theoretically available to them. The QN reading of (1b) is rejected on the basis of the requirement for residual topics, and the NQ reading of (1a) was disfavored due to the blocking effect.

Since the same story must go for the sentences in (2), we might expect (2a) and (2b) to be ambiguous, which is not the case. Let us consider the following three f-structures.

- (39) a. [Taro-wa]<sub>TOP</sub> [tokidoki(-wa)]<sub>FOC</sub> gakko-ni ika-nai

b. [Taro-wa]<sub>TOP</sub> [[tokidoki(-wa)]<sub>FOC</sub> gakko-ni ika-nai]<sub>FOC</sub>

c. [Taro-wa]<sub>TOP</sub> tokidoki [gakko-ni ika-nai]<sub>FOC</sub>

(39a) corresponds to the QN reading and (39b) and (39c) represent the NQ reading. (40) and (41) are the interpretations of (39a) without and with the topic marker, respectively. The variable  $P$  ranges over the alternatives of the frequency adverb *sometimes*.

(40) a. Presupposition  $\exists P[P(\sim go(t, school))]$   
 b. Assertion  $sometimes \in \lambda P[P(\sim go(t, school))]$

(41) a. Presupposition  $\exists P[P(\sim go(t, school))]$   
 b. Assertion  $sometimes \in \lambda P[P(\sim go(t, school))]$   
 c. Implicature for some  $Q \in ALT(sometimes)$ , whether or not Taro goes to school at  $Q$ -occasions is an open issue.

(42) *everyday > frequently > sometimes*

I assume that *sometimes* is the least element in the scale that consists of its alternatives and ordered by implication relation. ((42), for examples.) Then, the assertion in (40) is virtually equivalent to its presupposition. Thus (39a) without the topic marker adds no new information to what is presupposed. So I conclude this f-structure is anomalous.

The same holds for (41), but in this case there is an implicature induced by the topic marker. It contrasts *sometimes* with some other adverbial quantifier. Because of this implicature, (41) is better than (40).

The presupposition and the assertion of (39b) is the following.

(43) a. Presupposition  $\exists P[P(go(t, school))]$   
 b. Assertion  $sometimes \notin \lambda P[P(go(t, school))]$

Note that the assertion in (43) entails that Taro never goes to school, which contradicts the presupposition (a). Therefore (39b) with or without the topic marker expresses a contradiction, and hence is unavailable.

The last f-structure to be considered is (39c).

(44) a. Presupposition  $\exists P[sometimes(P(t))]$   
 b. Assertion  $not\ go\ to\ school \in \lambda P[sometimes(P(t))]$

As we have seen previously, the scope of the negative operator is limited to the main focus, and therefore this f-structure means that not to go to school is one of the things Taro does sometimes, which yields the QN reading.

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