NEGATION SCOPE AND PHRASE STRUCTURE IN JAPANESE

by

Dennis Ryan Storoshenko

BA, Simon Fraser University, 2002

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS
in the Department
of
Linguistics

SIMON FRASER UNIVERSITY
April 2004

APPROVAL

Name:	Dennis Ryan Storoshenko
Degree:	Master of Arts
Title of thesis:	Negation Scope and Phrase Structure in Japanese
Examining Committee:	Dr. Trude Heift Chair
	Dr. Chung-hye Han, Assistant Professor, Linguistics Simon Fraser University Senior Supervisor
	Dr. Nancy Hedberg, Associate Professor, Linguistics Simon Fraser University Supervisor
	Dr. Yue Wang, Assistant Professor, Linguistics, Simon Fraser University Supervisor
	Dr. Martina Wiltschko, External Examiner, Assistant Professor, Linguistics University of British Columbia
Date Approved:	

Abstract

The position of negation in the phrase structure of Japanese remains a contentious question in the literature. Where a particular position is adopted, it is not always done so consistently with other works, and specific choices are not always justified. Judgments regarding the scope of negation would be very valuable to reaching a final principled account of negation's place in the phrase structure, but unfortunately the literature on that matter is not clear either. The data regarding Japanese negation scope is so contradictory and lacking in an empirical base that some researchers have declared it to be useless for syntactic analysis (Fukui & Sakai 2003). Seeking solid scope data upon which to base a conclusion about the structure of negation, we use a Truth Value Judgement Task (Crain & Thornton 1998) experiment to elicit scope judgements from 48 native speakers of Japanese. Participants were shown scenarios designed to elicit judgements on Q>Neg or Neg>Q readings, using two different forms of negation. Based on the results of the experiment, we reach a conclusion placing NegP relatively low in the phrase structure, within the vP domain. Furthermore, similarity between the results of this study and a similar study on Korean (Han *et al* 2003), implies that overt verb raising exists for half of native Japanese speakers, and leads to further questions in the larger domain of head-final languages, and language acquisition.

"What is required now is a feat of linguistic legerdemain and a degree of intrepidity."

—Captain Spock, Star Trek VI: The Undiscovered Country

Acknowledgments

This section, like another great literary work, grew in the writing. First and foremost, thanks must go to my senior supervisor, Dr. Chung-hye Han for invaluable advice, inexhaustible patience, the occasional inspirational drink, and for making me believe in LaTeX. Yasuko Sakurai, without your patience in providing native speaker judgements and hard work during the entire experiment process, this thesis would have suffered greatly. My other committee members: Nancy Hedberg for frequent chats while commuting, Yue Wang for introducing the us to inferential statistics, and Martina Wiltschko, whose input has led to a much stronger final product. And of course, the rest of the faculty and grad students that have been so amazingly supportive over the six years since I first stumbled into this department as a lowly undergrad.

But being such an all-consuming task, a thesis quickly spreads beyond the walls of the university, taking over other parts of the author's life. Mike, all the late night-coffee runs have been invaluable to my sanity. Will, as you have reminded me, yes there *is* a world out there. James, if I ever get too full of myself, I know who to call.

To the staff and regulars at Blenz on Davie and Melriches, thank you for tolerating me and my laptop all these days and nights.

Contents

List of Tables

List of Figures

Chapter 1

Introduction

In this introductory chapter, the research questions underlying this work are broadly outlined, leading to a sketch of the entire work.

1.1 Questions

The status of negation in Japanese remains largely unexplored in the syntactic literature. Early accounts, coming from a time when hierarchical phrase structure was not assumed for Japanese, are not easily reconciled with more recent approaches, and later accounts are based on unjustified assumptions about phrase structure. Negation is generally treated in one of two ways: it is either given as a purely morphological phenomenon with no reflection in the phrase structure, or a functional head is assumed to exist without any motivation for its existence or placement (Fukushima 1998, Miyagawa 2001). This is our starting point: given these two approaches, does one stand out as being stronger, and if so, what supporting data can be identified? Here, we will ultimately adopt an analysis where negation enters the phrase structure as its own functional head, carrying a bound form which must attach to a suitable verbal host.

It is the matter of placing this functional head which will be more problematic, as simple questions of linear word order turn out to be an insufficient means for determining the structure. Given that Japanese is a language with scope rigidity, where the surface structure dictates possible scope readings, it should be possible to reverse-engineer an account of the structure based on available scope readings. However, the literature turns out to be so confused on this matter that available scope judgements seem to be useless.

This prompts a psycholinguistic experiment, using a Truth Value Judgement Task (Crain & Thornton 1998) to elicit scope judgements in a controlled and systematic manner. The intention is to use the results of this experiment to form a solid account of Japanese negation scope, thus providing the necessary data to place negation in the phrase structure. However, the results of the experiment prompt discussion on another contentious issue in Japanese syntax: overt verb raising.

Following Han et al. (2003), the results of the truth value judgement task will be explained in the context of a proposal that only half of the Japanese population demonstrates a grammar with overt verb raising. Discussion of the available literature on verb raising in Japanese shows that the split grammar hypothesis does indeed account for the data. Thus, we not only end up with data that points out where negation must be placed in the phrase structure, but an account of the apparently unrelated question of overt verb raising is proposed, and interesting questions for the poverty of stimulus argument are raised. Given the results found here, it seems that in the face of insufficient and possibly inconsistent input data, language learners resort to a parametric coin toss on the matter of overt verb raising.

1.2 Organisation of the Thesis

This thesis will follow the following structure:

In Chapter Two, the bulk of the previous data regarding negation is discussed and evaluated. This begins with a broad sketch of the various types of negation in Japanese, through the morphology versus syntax debate, and into the syntactic data which would hopefully motivate a particular choice for the placement of the negation head. This is followed by an in-depth analysis of the available data concerning negation scope in Japanese, ultimately leading to the conclusion that new data must be collected.

Chapter Three is largely concerned with the design of the Truth Value Judgement Task. The experiment conducted here is a modification on the basic research protocols originally formulated by Crain and Thornton, leading to a protocol with increased control, and one that is more suited to adult participants as opposed to children. This chapter also contains discussion on the formation of the actual sentences which were given to the research participants for judgement.

In the following chapter, the actual mechanics of conducting the experiment are covered. Statistics are given on the composition of the participant population, and the results of the

experiment follow.

The interpretation of the experimental data comes in Chapter Five. This begins with an analysis of what consequences the results have for the original question of placing negation in the phrase structure of Japanese. The key data which points to a particular solution is identified, but it also identifies a distinct split in the population. This split is along the axis of verb raising; after reviewing the literature on verb raising in Japanese, the results of the experiment are re-interpreted in the context of being indicative of a population where half of the people have overt verb raising, and half do not. The original judgements on the placement of negation is shown to still be consistent with this new interpretation, however, this new interpretation has some implications concerning the poverty of stimulus argument. The final section of this chapter concerns the methodological lessons which were learned over the course of the study. The discussion in this section is largely based on comments arising from the debriefing sessions with participants.

The final chapter contains a brief review of the conclusions reached in the thesis, and outlines future avenues of research suggested by the results of our experiment.

Readers who are particularly concerned with the research methodology employed here are directed to Chapters Three and Four, as well as the last section of Chapter Five. These can stand alone without necessitating a deep understanding of the syntax motivating the study, and the final section of Chapter Five is of particular interest to anyone interested in conducting a Truth Value Judgement Task: the lessons we have learned on the matter of constructing scenarios and test sentences highlight just how much care must be exercised in conducting this kind of research. For readers who are more interested in the core syntactic issues, Chapter Three is not vital reading, and the last section of Chapter Five can safely be passed over. Chapter Four should still be examined as it presents the data upon which all the syntactic argumentation of Chapter Five is based.

Chapter 2

Reviewing Japanese Negation

In the existing literature on Japanese syntax, there is precious little said on the subject of the structure of negation. Kuno's 1973 *Structure of the Japanese Language* side-steps the matter completely, making only a few references to the scope of negation. The same applies to Kuroda's Dissertation *Generative Grammatical Studies in the Japanese Language*; both authors mention negation, noting its proximity to the verb, but do not venture further into the examination of negation's place in the overall phrase structure of the language.

This could in part be a result of the fact that overall studies of Japanese phrase structure were still in their infancy; Oishi (1986) reports that the debate over whether or not Japanese had a VP lasted well into the 1980's. After the rise and fall of functional categories in standard generative syntax, there still remains no solid account of where negation lies in Japanese phrase structure. In this chapter, the facts about Japanese negation will be reviewed, and the treatments thereof in the literature will be introduced.

2.1 Types of Negation

In Japanese, three types of negation can be observed[1]. For ease of discussion, each will be given a distinct designation; the distinguishing characteristics of each will be discussed below. "Plain" negation refers to the simplest form of negation employed in the language. Long-form negation, hereinafter *wa* negation, so-named in recognition of an extra marker

[1]This does not include idiomatic or "frozen" forms which seem to contain a negation morpheme but do not fully function as truly negated items, as discussed in Fukushima (1998)

on the verb root, and "free" negation, where the negation element is not verbally bound.

2.1.1 Plain Negation

At the surface, "plain" negation is the simplest form of negation in Japanese. It is most notably characterised by the appearance of a negation morpheme at the right edge of a verbal root:

(1) a. Jiroo-ga piza-o tabe-ru.
Jiroo-NOM pizza-ACC eat-NPST
'Jiroo eats pizza.'

b. Jiroo-ga piza-o tabe- na-i
Jiroo-NOM pizza-ACC eat-NEG-NPST
'Jiroo does not eat pizza.'[2]

Interestingly, it is this kind of negation for which it is hardest to find a consistent treatment. One might speculate that this is due to the fact that apart from the appearance of *na*, the affirmative (1a) and negative (1b) are configurationally identical; the other forms of negation employ more articulated structures, and thus this form is overlooked and underestimated:

(2) a. Plain Affirmative
V-T

b. Plain Negative
V-*na*-T

However, while the affixation of *na* to the verb root is apparent enough, an account which addresses, let alone explains the alternation in the tense markers, as shown in (1), is rare. Schematically, the difference between the affirmative and negative sentences here is given in (2):

However, this bare schema does not address the alternation in tense forms, which will be discussed further below.

2.1.2 *wa*-Negation

This type of negation, more complex than plain negation, is given the name *wa*-negation owing to the *wa* particle attached directly to the verb root:

[2]For a listing of all the abbreviations used in the glosses, see Appendix B.

(3) Jiroo-ga piza-o tabe-wa shi-na-i.
Jiroo-NOM pizza-ACC eat-TOP do-NEG-NPST
'Jiroo doesn't eat pizza.'

That this distinct sentence form is not a direct result of some sort of different negation being employed is demonstrated by the fact that the same sentence structure appears without negation, and no perceived change in meaning (Kuroda 1979):

(4) Jiroo-ga piza-o tabe-wa su-ru.
Jiroo-NOM pizza-ACC eat-TOP do-NPST
'Jiroo eats pizza.'[3]

Thus, it seems clear that what we are observing is not a different type of negation *per se*, but rather the application of negation to a different type of sentence. Decomposing these sentences into schematic form yields quite a difference from the examples in (2):

(5) a. Affirmative with *wa*
V-*wa suru*-T

b. Negative with *wa*
V-*wa suru-na*-T

That we are dealing with a single type of negation interacting with other elements in the sentence can be demonstrated by two further tests. Firstly, there is the fact that *suru* can not appear in a structure which is otherwise consistent with plain negation:

(6) * Jiroo-ga piza-o tabe-na su-ru.
Jiroo-NOM pizza-ACC eat-NEG do-NPST
'Jiroo does not eat pizza.'

The fact that the two different negation forms can not be combined to form a double negation is even more indicative:

(7) * Jiroo-ga piza-o tabe-na-wa shi-na-i
Jiroo-NOM pizza-ACC eat-NEG-TOP do-NEG-NPST
'Jiroo does not not eat pizza.'

[3]The alternation in the forms of the verb 'do' (*su*/*shi*) is not significant to the meaning of the sentences, and is merely a function of the irregularity of the verb. Throughout this thesis, the standard tradition of referring to this verb in its "dictionary" form, *suru*, is adopted, but the variable root will be indicated in all glossed examples.

As shown in (7), it is impossible to combine the two forms of negation. This suggests that within a single clause, there is only one possible "slot" for negation. Thus, our goal should be to reach an account based on a single treatment of negation, placed in two different structures. In the interests of discursive ease, we will continue to refer to the negation of the sentence type characterised by the *wa* marker on the verb root as *wa* negation, despite the fact that the *wa* marker is not, strictly speaking, a part of the negation.

2.1.3 Free Negation

The third type of negation found in Japanese is most generally characterised by the fact that the negation element is not bound to a verb, but is in fact free in the sentence:

(8) Jiroo-ga piza-o tabe-ru-no-de-wa na-i
Jiroo-NOM pizza-ACC eat-NPST-NL-COP-TOP NEG-NPST
'Jiroo does not eat pizza.'

As is clear from (8), there is a good deal more material in this type of negation. A schematic look at this sentence highlights exactly what is different:

(9) V-T-*no-de-wa na*-T

Specifically, attention should be drawn to the markers appearing on the verb root. As in a plain affirmative sentence, the first affix on the verb is for tense, but this is followed by a nominaliser, then a copula, then *wa*. Then, as a separate entity, the negation element appears in the position usually occupied by a verb or predicative adjective, bearing a second tense marker. Further differentiating this from the other two forms, double-negation can be employed:

(10) Jiroo-ga piza-o tabe-na-i-no-de-wa na-i
Jiroo-NOM pizza-ACC eat-NEG-NPST-NL-COP-TOP NEG-NPST
'Jiroo doesn't not eat pizza.'

Thus, there are now three reasons why this type of negation should be treated as markedly different from the other two. Firstly, there is the fact that the negation is not verbally bound. Secondly, this seems to be a bi-clausal structure, initially indicated by the fact that there are two separate tense markings, and further supported by the possibility of double negation. Neither of these was the case for the plain and *wa* negation forms, as indicated in

(2) and (5). The third reason why this negation form should be treated separately is only revealed after an inspection of the schematic form of the double-negated sentence in (10):

(11) V-*na*-T-*no-de-wa na*-T

In comparing this form with the plain negation schematic in (2b), the initial verb is in the same form as plain negation, embedded within a more complex structure. This demonstrates that within a single sentence, negation can appear in two different forms. Given these three pieces of evidence, a separation of the free negation from plain and *wa* negation seems justified.

2.1.4 Scope of This Study

As noted above, the formation of negation in the first two types has not been thoroughly explored. Taking this in concert with the distinctions outlined above, this thesis will be limited to a discussion of plain and *wa* negation. From the initial analysis, it seems clear that these two should be derivable from a single account of negation, whereas as analysis of the free negation would be quite different in character.[4]

2.2 *na*

Upon examination of (1b) and (3) above, one would claim that *na* is a suffix, attaching directly to the verb. However, (8) tells a different story, implying that *na* is not necessarily a bound form, but is in fact free and can stand in place of a verb. This discrepancy is taken up in Oishi (1986), leading to the conclusion that there are two types of *na*: one free and one bound. A brief summary of the evidence presented there provides the opportunity to establish some important traits of *na*, which will serve as background to further discussion.

As has already been shown, when tense inflections attach to the right of *na*, they are not the same forms as would attach directly to verbs:

(12) a. Jiroo-ga piza-o tabe-ru.
Jiroo-NOM pizza-ACC eat-NPST
'Jiroo eats pizza.'

[4]For a full account of the free negation form, readers are referred to Oishi (1986), whose discussion forms the basis of the brief sketch of that form presented here.

b. Jiroo-ga piza-o tabe-ta.
Jiroo-NOM pizza-ACC eat-PST
'Jiroo ate pizza.'

c. Jiroo-ga piza-o tabe-na-i.
Jiroo-NOM pizza-ACC eat-NEG-NPST
'Jiroo does not eat pizza.'

d. Jiroo-ga piza-o tabe-na-katta.
Jiroo-NOM pizza-ACC eat-NEG-PST
'Jiroo did not eat pizza.'

Where negation is employed, the nonpast marker is *-i* and the past marker *-katta*. However, negated verbs are not the only forms in Japanese to follow this pattern:

(13) a. Hon-wa oki-i.
book-TOP big-NPST
'The book is big.'

b. Hon-wa oki-katta.
book-TOP big-PST
'The book was big.'

As demonstrated by (13), the inflections for predicative adjectives in Japanese are the same as for negated verbs: *-i* for nonpast, and *-katta* for past. This observation also has a potential bearing on the choice of segmentation and glossing which will be used throughout this thesis. While the glosses for the nonpast forms are standard, the glosses for the past forms shown here are somewhat more debatable. This type of gloss is used in some of the extant literature (Kuno 1980, Kitamoto 1986), but there are also some who would split the string 'nakatta' as 'nakat-ta' emphasising a uniformity of tense markers, as opposed to a uniformity of negation markers (Ota & Kato 1986, Miyagawa 2001). Given that the tense marker is already different in the Nonpast form, it seems preferable to assume that the past marker changes as well, keeping the negation marker stable. Furthermore, the same tense markers appear without negation in the examples in (13) where predicative adjectives are used. While this provides justification for the glosses, it can be taken to suggest that *na* is an adjective in Japanese, which would make negated verbs some sort of derived adjectives.

This claim is also said to be supported by the fact that *na* can replace the verb *aru*, existential 'be'. This places the *na* in the sentence-final position where syntactic distribution would identify it as either an adjective or a verb. However, it should be noted that the "traditional" means of negating *aru* is not available:

(14) a. Hon-ga ar-u.
book-NOM exist-NPST
'There are books.'

b. Hon-ga na-i.
book-NOM NEG-NPST
'There are no books.'

c. * Hon-ga ar-ana-i.
book-NOM exist-NEG-NPST
'There are no books.'

d. * Hon-ga na-u.
book-NOM NEG-NPST
'There are no books.'

Attachment of negation directly to the verb *aru* as in (14c) results in an ungrammatical sentence for native speakers of Japanese, despite the fact that they recognise it as an otherwise possible inflection of the verb. Also note that *na* is inflected as an adjective would be in this position, not as a verb, as indicated by the grammaticality of (14b) versus the ungrammaticality of (14d). Given the fact that *na* inflects this way when affixed to a verb, it is not all that unexpected, but it seems unusual for a verb to be replaced by what looks like an adjective. Oishi (1986) takes the position that this *aru*/*na* alternation is a special case in Japanese, based on the fact that *aru* is the only verb negated in this manner.[5]

The best evidence for the claim that verbally-adjoined *-na* is an affix is its phonological variation. The form of the negative morpheme given in (14c), *-ana*, is a predictable phonological variation which depends upon whether the final segment of the verbal root is a consonant or a vowel:

(15) a. Jiroo-ga piza-o tabe-na-i.
Jiroo-NOM pizza-ACC eat-NEG-NPST
'Jiroo does not eat pizza.

b. * Jiroo-ga piza-o tabe-ana-i.
Jiroo-NOM pizza-ACC eat-NEG-NPST
'Jiroo does not eat pizza.

[5]Determining the exact nature of this "special case" is beyond the scope of this study. One possibility worth exploring would be the possibility that the free negation is some sort of negative existential predicate (Martina Wiltschko, personal correspondence).

c. Jiroo-ga biiru-o nom-ana-i.
Jiroo-NOM beer-ACC drink-NEG-NPST
'Jiroo does not drink beer.'

d. * Jiroo-ga biiru-o nom-na-i.
Jiroo-NOM beer-ACC drink-NEG-NPST
'Jiroo does not drink beer.'

The standard analysis is to posit an underlying form of *ana* for the negation, with a vowel deletion taking place where the verb root ends with a vowel, as with *tabe*. Where the verb root ends with a consonant, the underlying vowel must be retained, as with *yom*. Other analyses exist where this vowel is considered to be a separate morpheme, or, more commonly, a part of the verb root (Kuno 1980, Miyagawa 2001). Most importantly, the *na* of free negation does not change when preceded by a consonant:

(16) a. Biiru-ga sam-bon ar-u.
beer-NOM three-CL exist-NPST
'There are three beers.'

b. Biiru-ga sam-bon na-i.
beer-NOM three-CL NEG-NPST
'There are not three beers.'

c. * Biiru-ga sam-bon ana-i.
beer-NOM three-CL NEG-NPST
'There are not three beers.'

This may be the clearest indication of all that the bound and free forms of negation are two separate entities. If they were the same, then given the evidence from the verb paradigms, an underlying form of *ana* should be posited, which is shown to be ungrammatical in (16c). Furthermore, the affirmative example (16a) demonstrates that Japanese does not delete vowels across word boundaries, as the initial vowel of *aru* remains intact in the same position. Thus, if it were *ana* replacing *aru*, then (16c) ought to be grammatical. This leaves us with strong evidence that the *na*/*ana* alternation seen in the bound negation is evidence of a phonological process which is active only in cases of affixation. For discursive purposes, we will continue to refer to the bound form as *-na*, remaining aware that there is a different underlying form.

Word order is also a good indicator of the status of *-na*, as the rigid condition of keeping negation bound to the verb, although left-adjacent to the tense marker, is more indicative

of a bound morpheme than of a free one. This bound morpheme then, must be a suffix of some sort. However, this leads to the question of whether *-na* is a derivational or an inflectional suffix. This discussion will have a direct bearing on where exactly *-na* is located in Japanese phrase structure.

2.3 Placing *-na* in the Structure

At the most basic level, there are two possibilities: either negation is base generated as a part of the verb, or it appears under its own projection, NegP. These two positions will be referred to as the lexical and structural accounts of negation, here meant to correspond to either a derivational or an inflectional approach. Each has its own supporters in the literature, and their assumptions and the implications thereof will be examined in turn.

2.3.1 The Lexical Account

The lexicalist position would be to claim that the observed bound morpheme adjoins to the verb in the lexicon as a derivational affix. This would mean that the negative morpheme enters the phrase structure already adjoined to the verb root, without any independent representation in the syntax. This approach has some support in the current literature (Fukushima 1998), and is the more traditional view, a holdover from the period in which Japanese syntax was not believed to have any hierarchical structure at all; negation was simply a part of the verb.

However, there are problems with this analysis. Most notable is the afore-mentioned alternation in inflection patterns. If a negated verb were truly a lexical item, then by the inflection pattern, one would be forced to conclude that this lexical item was actually an adjective. Inflection, however, is just one of the three standard metrics for evaluating the grammatical category of a given word. Syntactic distribution is unrevealing in this case, as it has already been shown that verbs and adjectives can occupy the same position in a sentence. A meaning-based argument could be made, attempting to claim that somehow "not eat" involves the denial of an action, while something like "not big" denies the assignment of the property "big" to some object, but such an argument would be weak at best. The best evidence that negated verbs are still verbs and not adjectives comes out of their case-assigning properties. Negated verbs are still capable of assigning nominative and accusative cases, just as their affirmative counterparts. Adjectives in Japanese assign nominative case

to their internal arguments, whereas a verb in the same structure would assign accusative case:

(17) a. Noriko-wa Shuya-ga suki desu.
Noriko-TOP Shuya-NOM fond of COP
'Noriko is fond of Shuya.'

b. *Noriko-wa Shuya-o suki desu.
Noriko-TOP Shuya-ACC fond of COP
'Noriko is fond of Shuya.'

c. Shuya-wa piza-o tabe-na-i.
Shuya-TOP pizza-ACC eat-NEG-NPST
'Shuya eats pizza.'

Here, the adjective *suki* has assigned the nominative case to its internal argument in (17a), where accusative case is judged to be ungrammatical as in (17b). Conversely, a negated verb still assigns accusative case to its internal argument, as shown in (17c). This would seem to be a fundamental distinction between verbs and adjectives in the language. [6]

It is also not difficult to illustrate that negation is somewhat unique in its inflectional behaviour, and thus different from other verbal affixes. Take for example the 'potential' suffix *-rare*. Unlike negation, this attachment does not change the inflectional pattern; verbs marked for potentiality still take the same tense markers as plain verbs:

(18) a. Hikaru-ga iwa-o mochi-age-ta.
Hikaru-NOM rock-ACC lift-up-PST
'Hikaru lifted up the rock.'

b. Hikaru-ga iwa-o mochi-age-rare-ta.
Hikaru-NOM rock-ACC lift-up-can-PST
'Hikaru could pick up the rock.'

Also note that verbs marked for potentiality behave like regular verbs when interacting with negation; they too change their inflectional pattern:

(19) a. Hikaru-ga iwa-o mochi-age-rare-na-katta.
Hikaru-NOM rock-ACC lift-up-can-NEG-PST
'Hikaru could not lift up the rock.'

[6] This is by no means an exhaustive search for evidence that negated verbs are not adjectives. While it may yet emerge that there is something to the claim that negated verbs are adjectives in Japanese, here we hold on to the notion that they are still verbs.

b. * Hikaru-ga iwa-o mochi-age-rare-na-ta.
Hikaru-NOM rock-ACC lift-up-can-NEG-PST
'Hikaru could not lift up the rock.'

Furthermore, the ordering of the affixes is fixed; markers such as *-rare* or the passive marker *-sase* must be adjacent to the verb, whereas negation is always the last marker before tense:

(20) * Hikaru-ga iwa-o mochi-age-na-rare-katta.
Hikaru-NOM rock-ACC lift-up-NEG-can-PST
'Hikaru could not lift up the rock.'

In the face of all this data, a logical conclusion would seem to be that all affixes which occur closer to the verb root are lexical phenomena, whereas negation, having a fixed position like tense, occupies its own unique position in the phrase structure.

Still, advocates of the lexicalist position such as Fukushima (1998) claim that for an agglutinative language such as Japanese, where inflections and other phenomena are attached directly to the verb as bound morphemes, separate functional categories for these elements are not just ill-advised, but in fact redundant. The reasoning goes that as negation is necessarily a part of the verb, having a separate negation head would amount to duplicating material that is already present, violating basic economy principles. In and of itself, this argument does have merit, but it is an overly narrow one, assuming that because the negation morpheme is bound to the verb, it is so bound throughout the derivation process. The position of the negation morpheme could just as easily be captured by an analysis in which *na* is an inflection, generated under a separate head, yet still necessarily bound to a verbal root in the course of the derivation.

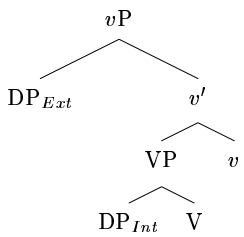
2.3.2 The Structural Account

The alternative to claiming that negation is a lexical phenomenon is to postulate a separate negation element in the lexicon, which is merged into the phrase structure under its own projection. Given the very limited placement options for negation in Japanese, attaching only to verbs or predicative adjectives, a full NegP seems to be the better choice. If negation were a modifier attaching freely into the VP, then one might expect wider distribution, with negation being able to attach to other elements in the sentence. As this is not the case, the NegP option is explored here. In contemporary generative accounts of Japanese syntax, this is usually the route chosen (Miyagawa 2001), however it is rarely adequately motivated.

Taking this position brings on the additional burden of defining where in the phrase structure the NegP will appear. In order to begin a discussion of the possible placement of negation, some assumptions about Japanese phrase structure in general first need to be clarified.

Following the standard in the literature, it is assumed that the Japanese VP is a head-final structure within a single Larsonian shell (Chomsky 1995; Koizumi 1995, 2001). DP's are shown here in their base-generated positions, with the eventual object being marked as the internal argument, and the eventual subject as the external argument:

(21)



Negation would then have to enter this picture as a Neg^0 head under a NegP somewhere within or above the structure given in (21). From this point onward, the formation of the V-Neg-T complex can either be a result of overt syntactic raising, or through a morphological process at PF, akin to tense lowering, as proposed for non-overt verb raising languages such as English. As there is not yet any evidence leading one way or the other, this matter will remain open for the time being.

While the lexical argument has its weaknesses, the proposal of a separate projection for negation should bear some sort of independent burden of proof. This challenge is raised by the visibility guideline for functional categories proposed in Fukui and Sakai (2003). In response to the proliferation of functional categories in generative syntax, Fukui and Sakai propose the following constraint:

(22) The Visibility Guideline for Functional Categories

A functional category has to be visible (i.e. detectable) in the primary linguistic data.

They further describe three ways in which a functional category can be visible: either the category has an overt phonetic form itself, triggers a morphological change in a neighbouring category, or triggers a movement which affects the canonical word order. It should be noted that these conditions are not meant to all hold simultaneously; the authors note that usually

the presence of the direct phonetic form and the presence of the two more indirect markers are mutually exclusive.

Japanese negation can easily be argued to meet the first of these conditions: a Neg^0 head in Japanese will certainly bear overt phonetic form: *-(a)na*. With this in place, the other two forms of evidence are, as expected, harder to locate in Japanese.

The second form of evidence can also arguably demonstrated in Japanese negation. Firstly, there is the matter of the *-na/-ana* alternation. If the initial *a* vowel is assumed to be a morphologically conditioned part of the verbal root, as is taught to learners of Japanese and indicated by most glosses, then this is a clear case of negation influencing an adjacent category; that this alternation is specific to the interaction between the verb root and a suffix was previously demonstrated. More concrete though is the previously discussed matter of the choice of tense marking: if the negation element were not present, then standard verbal tense marking would be used. The fact that the tense marking changes in the presence of negation might be taken as overt evidence for a negation head.

The final sign identified by Fukui and Sakai, visible movement of elements, will be even more difficult to detect. Any movement in the vicinity of V^0, Neg^0 and T^0 would most likely be some form of verb raising; however as discussed at length in Koizumi (1995, 2001), such verb raising would have no impact upon the string order of the sentence. Thus, no conclusive evidence of this final criterion can be cited, or at least not without some controversy. Nevertheless, with the first condition having been satisfactorily met, we seem to be proceeding in the right direction.

Another diagnostic for the nature of negation will be whether Japanese negation triggers any negative weak-island effects as defined by Ross (1983). If the presence of negation blocks the extraction of an adjunct from an embedded clause in a *Wh*-question, where argument extraction is acceptable, then we have good evidence for postulating a phrasal projection for negation. By positing a phrasal projection for negation, a specifier position, [Spec, NegP], becomes available. According to Rizzi (1990), it is an empty operator in this position which is responsible for the negative weak island, thus if evidence for this effect is found, then we have evidence for an empty operator in [Spec, NegP], which in turn is evidence for positing a phrasal projection for negation. The determination that Japanese does indeed demonstrate negative weak island effects dates back to Hoji (1995), and is echoed in Miyagawa (2002).

That overt object extraction is permitted is demonstrated in Miyagawa (2002):

(23) Nani-o$_i$ Hanako-shika [Taroo-ga t_i kat-ta to] omottei-na-i-no?
what-ACC$_i$ Hanako-only [Taroo-NOM t_i buy-PST C] think-NEG-NPST-Q
'What does only Hanako think that Taroo bought?'

As shown in (23), extraction of the lower object is acceptable in Japanese. However, this is not the case for adjuncts in an embedded clause:

(24) a. Shuya-ga kinoo Noriko-ga suupu-o non-da to omo-ana-katta.
Shuya-NOM yesterday Noriko-NOM soup-ACC drink-PST C think-NEG-PST
'Shuya did not think Noriko drank soup yesterday.'

b. Shuya-ga itsu Noriko-ga suupu-o non-da to omo-ana-katta-no?
Shuya-NOM when Noriko-NOM soup-ACC drink-PST C think-NEG-PST-Q
'When didn't Shuya think Noriko drank soup?'

The sentence given in (24a) is ambiguous. In one reading yesterday refers to the time of not thinking, and in the other yesterday refers to the time of Noriko's soup eating. In (24b), a *Wh*-question, the sentence is no longer ambiguous, and is compatible only with a reading where the time of Shuya's thinking is being asked about; an analysis where *itsu* is a part of the lower clause is not available, thus demonstrating the negative weak island effect. Having demonstrated that this effect is active, we have further proof that negation does indeed head a phrasal projection in the phrase structure of Japanese.[7][8]

2.4 Placing NegP

Using the structure in (21) as a starting point, and assuming that that structure is the complement of T^0 in the affirmative case, there are two possible locations for NegP: either as complement of T^0, dominating the entire vP, or as complement of v, dominating only the lower VP. However, before advancing a claim for one or the other position, one matter needs to be addressed: raising of the object DP.

[7] While this argumentation hinges on an empty operator at [Spec, NegP], in the interests of keeping the tree diagrams as simple as possible, this position will not be shown.

[8] With this established, the possibility that negated verbs are adjectives noted in Footnote 6 is somewhat weakened.

2.4.1 Object Raising

Before proposing a structure that accounts for the facts about negation, it is important to first establish a framework which accounts for more elementary matters in the syntax. For this reason, before the placement of negation relative to the verb phrase can be discussed, it must first be established whether there are other forces dictating the shape of VP (or vP, as the case may be).

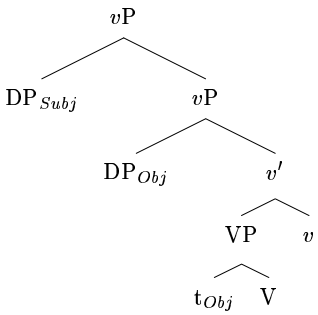
The status of the direct object DP in a transitive sentence is one of these matters which must be addressed. Following Chomsky (1995), the object DP begins as sister to V^0, as shown in (21). However, in order to satisfy the case filter, this DP must be checked for case, which can only occur in Spec-Head relation with some other syntactic head. Thus, the object must raise overtly to some specifier position, just as the subject must raise to [Spec, TP] for the same purpose.

The logical place for the object's case feature to be checked is in the specifier position of vP. The motivation for this claim comes from Burzio's generalisation, presented below as formulated in Reuland (2000):

(25) Burzio's Generalization
$\text{-ACC}_{struct} \leftrightarrow \text{-}\theta_{Ext}$

Translated, this means that when a verb does not assign accusative case to its internal argument, it also does not assign a theta role to the external argument, and vice versa (Reuland 2000). The inter-connectedness of these phenomena emerges through a simple comparison of the active and the passive voice. Essentially, both the accusative case assignment and the external theta-role assignments are absent in the passive, so it would not be unreasonable to assume that the difference between the active and the passive voice would be that passive structures are missing a single element which carries out both these functions. This element would be v. In order to account for the checking of accusative case in this position, a second specifier position must be postulated for v. This is represented graphically in (26):

(26)



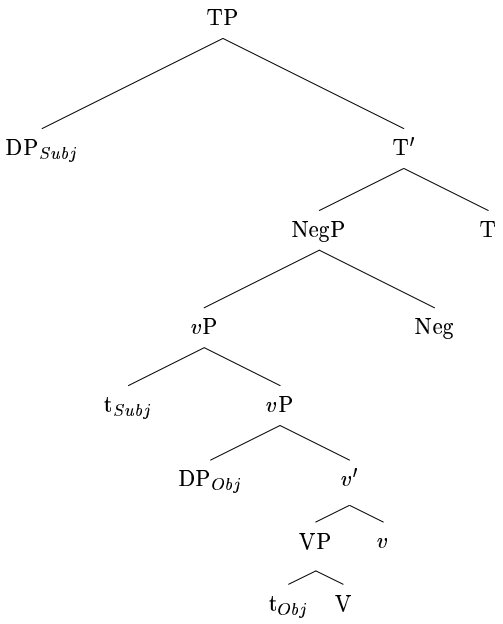
With this final refinement, the placement of NegP should have a more tangible effect.

2.4.2 Two Options for the Placement of NegP

Working from the final vP structure given in (26), there are two likely positions where NegP could appear such that a Neg^0 head will intervene between V^0 and T^0. One choice places negation outside of the entire verbal domain, whereas the other places negation right in the middle.

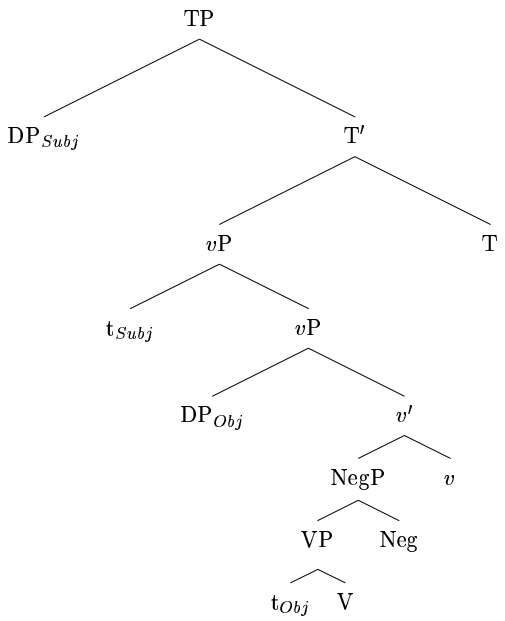
The higher choice, placing NegP outside the vP domain as sister to T^0, is the most common analysis to be found in contemporary literature (Miyagawa 2001). The structure is given in (27), including the movement of the subject DP to [Spec, TP], and a position for an empty operator at [Spec, NegP]:

(27)



Conversely, a lower-placed alternative does exist, although it has not been previously proposed for Japanese. The placement of NegP within the verbal domain has been previously proposed in Hagstrom (1995) for Korean, which is structurally similar to Japanese. This alternative would have the following structure (28):

(28)



While the arguments for positing this structure in Korean, based largely on children's acquisition errors, do not translate over into the present discussion of Japanese, the structure is still a viable alternative. Indeed, despite the apparent oddity of positing a functional category within a lexical domain, we will ultimately conclude that this is the favoured of the two analyses.

2.4.3 Selecting a Structure

With these two options, syntactic evidence must now be found to determine which is in fact the better choice for the placement of NegP.

Coordination

One possible means of selecting between the two proposed structures is the use of coordination data. Under the higher placement of negation, it should be possible to coordinate verbs and their direct objects at the vP level, which would force both verbs under the scope of

a single negation morpheme in a negated sentence. Conversely, the lower placement option would allow for vP's to be coordinated without having both necessarily being negated, as each coordinate would contain its own negation head. This is illustrated below:

(29) John-ga [biiru-o nomu] to [piza-o tabe-na-i].
John-NOM [beer-ACC drink] and [pizza-ACC eat-NEG-NPST]
* 'John did not drink beer or eat pizza.'
? 'John drank beer and did not eat pizza.'

As shown by the judgements, negation can only take scope over the second vP in this coordinate structure, which in turn implies that negation lies below the vP level. Were negation higher, it would be able to scope over both conjoined vP's in the above example. The question mark beside the narrow reading indicates that while this is the only possible reading, there is something standing in the way of unconditional acceptance. Similar results are found in Kuno (1973):

(30) John-wa uwagi-o nugu to hangaa-ni kake-na-katta.
John-TOP jacket-ACC take off and hanger-DAT hang-NEG-PST
* 'It was not the case that John took off his jacket and hung it on a hanger.'
?? 'John, upon taking off his jacket, did not hang it on a hanger.'

As shown by the judgements, this sentence is only even possibly acceptable where negation takes scope over only the second verb. The question marks against the second reading are described more semantic than syntactic, indicated because it seems odd to be coordinating an event clause with a clause expressing the lack of an event. After native speaker consultation, it emerges that both examples would be salvaged by replacing the conjunction with *ga*, 'but,' which is generally held to be structurally on par with 'and,' but having an additional constraint that there should be some contrast between the conjuncts. However, it remains clear that the narrow reading is at least possible, while the wide reading of negation is definitely out. While his analysis of this example is in purely linear terms, Kuno's claim is quite simple: "...the command power of *na* cannot be extended to the left of *to*." (Kuno 1973, p 204) The hierarchical translation would be to claim that negation can only take scope within the second conjunct, not over both.[9]

[9]This claim hinges on establishing the fact that the conjuncts in these examples are indeed vP's, and not larger structures. This can be accomplished by way of an example employing adverbs:

While the judgements seem clear, additional questions regarding the interaction between tense and the verbs within each conjunct make this data questionable at best. From this point, the strongest claim to be made is that we might be inclined toward a lower placement analysis, but have not found solid proof.

Light Verb Constructions

Another place to look for evidence of the placement of the Neg^0 head would be to examine the interaction between negation and other material in the vP domain, specifically the light verb *suru*. An example of the light verb construction is given in (31):

(31) Miyoko-ga eigo-o benkyoo-su-ru.
Miyoko-NOM English-ACC study-do-NPST
'Miyoko studies English.'

Following the claim in Chomsky (1995) that light verbs appear at v^0, we here assume that the light verb *suru* is generated at the v^0 node. The status of *benkyoo* is more debatable, as there is room for debate as to whether an item such as *benkyoo* is a full-fledged verb in the first place. Following Isoda (1991), such items can be analysed as nominals taking accusative case marking alongside the light verb:

(32) Miyoko-ga benkyoo-o su-ru.
Miyoko-NOM study-ACC do-NPST
'Miyoko studies.'

While the exact status of this 'nominal verb' does not have any direct bearing on the matter at hand, we will use examples where the nominal verb has not received any case marking. When this sentence structure is negated, a result that apparently supports the higher placement of negation is obtained:

(33) Miyoko-ga eigo-o benkyoo-shi-na-i.
Miyoko-NOM English-ACC study-do-NEG-NPST

---

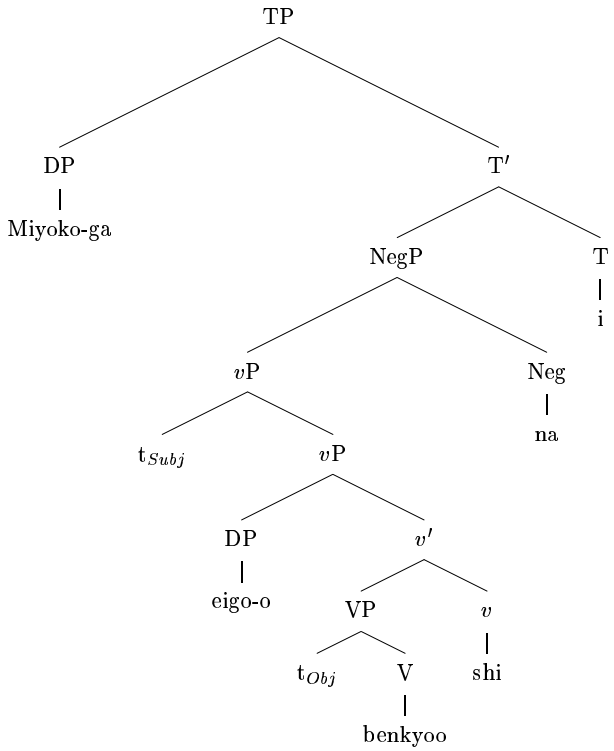
(1) John-ga [hayaku biiru-o nomi] ga [hayaku piza-o tabe]-na-i
John-NOM quickly beer-ACC drink but quickly pizza-ACC eat-NEG-NPST
'John quickly drank beer, but did not quickly eat pizza.'

In (1), adverbs appearing within the vP domain mark the left edge of each conjunct, indicating that the objects have remained *in situ* and have not raised to some higher functional projection. In the absence of any evidence for such raising, the possibility is hereby dismissed.

'Miyoko does not study English.'

Plugging this into the tree for the higher placement of negation directly yields the given word order:

(34)



This seems to imply that negation is in fact above the v^0 head in the syntax: it appears between the elements at v^0 and T^0. Conversely, the word order that would be directly generated by the lower placement analysis is not grammatical:

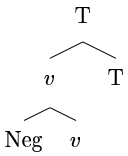
(35) * Miyoko-ga eigo-o benkyoo-na su-ru.
Miyoko-NOM English-ACC study-NEG do-NPST
'Miyoko does not study Japanese.'

However, the possibility must be considered that *benkyoo* may not be a suitable host for the negation morpheme. That nominal verbs such as *benkyoo* are not full verbs has already been established, and this difference may force negation to be marked on the light verb, no matter where it is base-generated.

If negation is indeed low in the structure, then it would originate below and to the left of the light verb, resulting in a string order of V-*na-suru*. Even if the negation moves up

and adjoins to the complex head at T^0, elements will still be in the incorrect order:

(36)



Thus phonetic relinearisation at PF must be postulated in this case to ensure that the *-na* attaches to the right of the light verb. If the assumption that *-na* must be bound to a verb is maintained here, then the movement and relinearisation argument gains a bit more support, as the nominal verb may not be a suitable host. It can thus be claimed that despite apparent evidence to the contrary, the lower placement of negation is at least consistent with this sentence structure.

Arguments based on PF rearrangements of elements can be readily found in the literature, with Fukui and Sakai (2003) being a recent example. There, they cite Kayne (1994) and Chomsky (1995) as assuming that syntactic constituency does not necessarily determine the temporal order of elements in an utterance. Scrambling is a common example of this, as it is generally held that the scrambling of elements has no impact on LF interpretations. In Embick and Noyer (2001) there is discussion of the re-ordering of complex structures which have been formed through cliticisation, indicating that it does indeed take place outside of the syntax at PF. The relinearisation being proposed here is more along these lines, as we are merely proposing the re-ordering of elements within a complex head, which should have no impact on the larger constituent structure.

wa Negation

Another potentially illuminating piece of information will be to see whether either placement of NegP lends itself better to an analysis of *wa* negation. This could be important, as the fact that the two types of negation can not co-occur suggests that the same Neg^0 head is active in each type of negation. We assume that any structure that works for plain negation must also work for *wa* negation.

As noted above, the most marked distinction between this structure and plain negation is the *wa* particle adjoined to the verb. The other major difference between the two types is the presence of the secondary verb *suru*. The logical way to proceed will be to attempt to determine whether the presence of the *wa* particle is the reason the extra verb is present, or vice versa.

As was already shown in (6), repeated below as (37), the additional verb can not appear with plain negation:

(37) * Jiroo-ga piza-o tabe-na su-ru.
Jiroo-NOM pizza-ACC eat-NEG do-NPST
'Jiroo does not eat pizza.'

Another good clue that the particle is to blame for the added verb is the fact that *wa* is not the only particle which co-occurs with the verb *suru*. The following example of coordination using *mo* is drawn from Fukui and Sakai (2003):

(38) [Taroo-ga Hanako-ni ringo-o 3-tsu age] mo [Kumiko-ni banana-o
[Taroo-NOM Hanako-DAT apple-ACC three-CL give] also [Kumiko-DAT banana-ACC
2-hon age] mo shi-ta.
two-CL give] also do-PST
'Taroo gave three apples to Hanako and two bananas to Kumiko.'

In this example, the conjuncts are vP's, dominated by a single T^0 head, indicated by the fact that there is one shared tense marker for both verbs. Note that this is different from the above coordination using *to*, (30), where the tense marker clearly interacted with the string-adjacent verb in the second conjunct.[10] From this, Fukui and Sakai conclude that *mo*, when used as a conjunction as in (38), inhibits the raising of V^0 to T^0. However, their analysis is equally compatible with a tense-lowering argument: *mo* could block the lowering operation, forcing a new verb which has no semantic content to be inserted, serving only to bear tense. This scenario is not at all controversial, as it is exactly how do-support has been described in English. When the main verb is blocked from bearing tense, a semantically null "dummy" verb is inserted.

Having demonstrated that at least one particle in Japanese triggers *suru*-support, this seems to be a plausible enough explanation for the situation with *wa* marked main verbs as well. The particle blocks the necessary interaction between the verb and tense, forcing the insertion of a dummy. The next question is to determine where this *suru* is inserted. That this *suru* is not the same one as in the light verb construction, and therefore not necessarily at v^0, can be shown by an example of a light verb construction under *wa* negation:

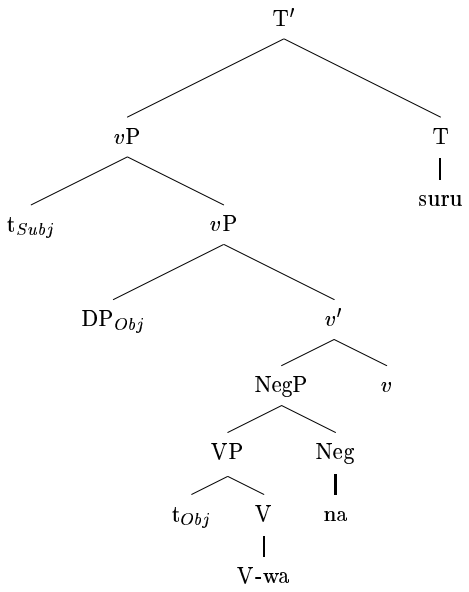
[10] Again, this is why we judge the evidence derived from the coordination example in (30) to be weak at best.

(39) Miyoko-ga benkyoo-shi-wa shi-na-katta.
Miyoko-NOM study-do-TOP do-NEG-PST
'Miyoko doesn't study.'

In (39), v^0 is occupied by the light verb, so the second *suru* must be one node higher, at T^0. As this verb is inserted in order to check off features at T^0, this is the most likely insertion point, again analogous to do-support in English.

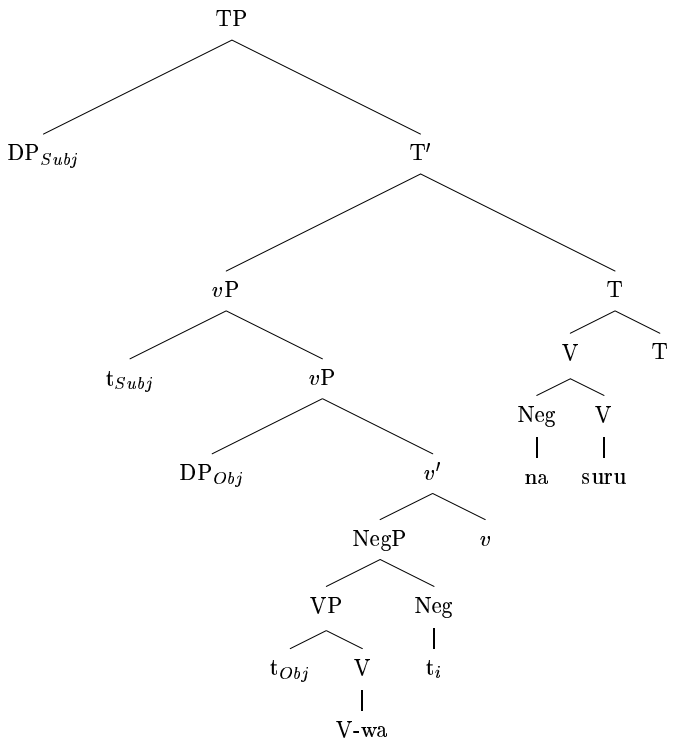
If it is indeed the case that *wa* blocks interaction between verbs and tense, either through verb raising or tense lowering, with *suru* being inserted at T^0, then it should become clear that this sentence structure actually provides no real evidence for the placement of NegP in the overall phrase structure. For a simple verb in *wa* negation, the string order given by the tree with high or low negation would be V-*wa*-*na*-*suru*. This is illustrated below using a tree adopting the lower placement; even if the higher placement were adopted, negation would still be below T^0:

(40)



No matter which structure is chosen, relinearisation is necessary. The situation is even worse in the *wa* negated light verb construction (39). Here, assuming a low placement of negation, the tree yields a string order of V-*na*-*suru*-*wa*-*suru*. Higher placement of negation would get negation closer, but it would merely place negation on the other side of the *wa* particle, still to the left of the higher *suru* at T^0. To get negation to T^0, we propose a direct cliticisation of negation, bringing it to T^0 in a complex head structure:

(41)



Then, in order to account for the string order, relinearisation within the complex tense head is needed, as illustrated in (36). The end result is that a PF relinearisation operation must be posited no matter where the negation element starts out. Thus, the fact that the same operation was needed for the lower placement option in the light verb construction is even less jarring; if relinearisation is required no matter what, then there is no additional cost in positing it for the light verb construction as well.[11]

We have so far established that negation should appear as its own functional head in the phrase structure of Japanese. Confronted with the dilemma of deciding between which of two possible placement options should be adopted, the data examined so far only slightly favours an analysis in which this functional head should be placed under vP. Given the relative weakness of the data so far, it would be ideal to find more definitive proof.

[11] One issue we leave unexplored in terms of *wa* negation is the placement of *wa* itself, specifically whether it is adjoined to the verb root, or heads its own projection dominating VP.

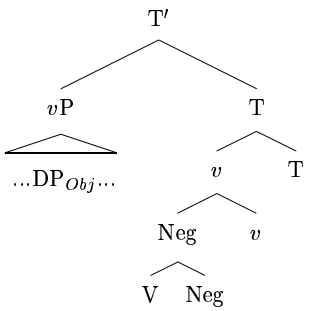
2.5 Negation Scope

So far, the arguments for a lower placement of Neg^0 have ignored probably the most telling piece of evidence: relative scope between negation and a quantifier in the object position. An examination of this interaction would be particularly helpful, as the two possible placements of NegP would predict very different results. Placing Neg^0 below v^0 suggests the possibility that a C-commanding object quantifier could take scope over negation, while the placement of Neg^0 above the vP domain makes a narrow reading of negation impossible, forcing it to always take scope over the object position.[12] The definition of C-Command underlying all the argumentation presented here is drawn from Kayne (1994):

(42) X C-Commands Y iff X and Y are categories and X excludes Y[13] and every category that dominates X dominates Y

This will be especially important for cases where negation is taken to be a part of a larger complex at the T^0 node:

(43)



Here, because the structure is formed through head-to-head adjunction, assuming a raising of the verb through negation then up to T^0, the nearest category dominating negation will be the T' node, allowing negation to C-Command into the vP domain. Again, while we do not yet have any evidence to support such a raising operation, it is important to establish at the outset that negation can C-Command from its resting place should it turn out to move. Similarly, this will hold in the *wa* negation analysis discussed in the previous section.

Before entering into an analysis of negation scope judgements for Japanese, it is necessary to establish the justification for the use of such data. Japanese (along with Korean), has

[12] That is, assuming that the object remains within vP. All bets are off if the object is found at a higher functional head above T^0

[13] X excludes Y if no segment of X dominates Y.

been claimed to be subject to a condition known as scope rigidity, which states that the scopal relations between quantificational elements at surface structure are preserved at LF (Kuno 1973, Hoji 1985). This constraint overrides any possible ambiguities introduced by the LF application of quantifier raising (QR).

QR has been postulated for languages such as English, where ambiguity abounds:

(44) Someone criticised many people.

This English sentence is ambiguous: either there is one person who criticised many people, or for each of many people there is a unique critic. QR, applying in two different ways, is the driving force behind this ambiguity. The same effect is not evident in the Japanese equivalent:

(45) Dareka-ga ooku-no-hitobito-o hihanshi-ta.
someone-NOM many-GEN-people-ACC criticize-PST
'Someone criticised many people.'

While the translation of (45) is identical to the English example, the scope availability judgements for native Japanese speakers are not. The only reading available is the one reflecting surface order C-Command relations: the subject C-Commands the object, and thus the existential quantifier takes scope over *ooku*. Given that scope rigidity is active, then judgements of negation scope should provide a direct clue to the relative positions of negation and a quantified expression.[14]

With such a clear structural distinction able to be made, one would think that finding the preferred solution should be easy. This is not the case; not only is the literature somewhat hampered by the concurrent evolutions in syntactic theory, but even trying to normalise pre P&P arguments into a Minimalist world, there are major inconsistencies between authors' judgements of what is and is not a possible reading for any given sentence.

2.5.1 Kuno

Susumu Kuno's first attempt at defining the scope of negation claims that that the negation morpheme has the narrowest scope possible: over only the immediately preceding verbal

[14]It has been argued in Sohn (1996) that Scope Rigidity is not necessary in order to account for the facts observed in Japanese and Korean. However, that analysis also hinges upon the abolition of QR. In the end, the result is the same: for Japanese, LF interpretation, accessed via scope judgements, is a reflection of the surface structure representation of the sentence in question.

element (Kuno 1980). He further claims that this also applies to elements bearing the "*wa* marker: negation does not take scope over them. This claim counters previous works, as Kuno refers to his claim as destroying the "myth" that such elements are in fact interpreted as under the scope of negation.

He later alters his claim somewhat though, presenting a key piece of data:

(46) a. Pai-o zenbu tabe-rare-ta.
Pie-ACC all eat-can-PST
'I could eat all the pie.'

b. Pai-o zenbu tabe-rare-na-katta.
Pie-ACC all eat-can-NEG-PST
'I could not eat all the pie.' (Q>Neg, Neg>Q)

According to Kuno, the primary interpretation of (46b) is that of partial negation (Neg>Q), where the speaker is assumed to have eaten some, but not all of the pie. The Q>Neg interpretation is the one where the speaker could eat none of the pie. Kuno's conspicuous use of the word *primary* here implies the possibility of ambiguity, although the fact that the negation can take scope over the object position at all immediately mars his previously neat claim. Thus, he appends "except when there is a quantifier in the sentence," (Kuno 1980, p 161) to his previous statement of negation scope. While appearing with no real analysis, this statement gives a hint to the fact that there is some interesting interaction between negation and quantifiers to be observed. In 1983, Kuno presents a two-clause treatise on the scope of negation:

(47) The Scope of the Negation Morpheme (revised)

> (i) The scope of the negative morpheme *nai*[15] does not extend over the verbals that precede them, unless multiple choice focus is involved. (ii) The thematic constituents are outside the scope of negation.

The second clause seems to be little more than a restatement of the major thrust of the first: it explicitly states that negation can not take scope over *wa*-marked elements, repeating the claim from 1980. However, the notion of multiple choice focus is introduced into the first clause. In Yatabe (1996), a later analysis of Kuno's work, this notion is defined as

[15]Kuno does not decompose negation into na-i, negation and tense.

focusing an expression that is understood to contrast with a small number of predictable alternatives. Quantifiers are still not directly mentioned in this revised formation, but the data presented remains consistent with Kuno's original observation that in sentences with object quantifiers, negation can take wider scope.

2.5.2 Kitamoto

Kitamoto (1986) summarises works on negation scope, attempting to re-cast disparate arguments into a unified conclusion. Crucially, Kitamoto provides a set of sentences with object quantifiers which are claimed to be ambiguous between Q>Neg readings and Neg>Q readings. He begins with Kuno's pie-eating example (46), and provides two more examples which are given as having two possible readings:[16]

(48) a. Kare-wa zibun-no-kako-no-ooku-o katara-na-katta
He-NOM his-GEN-past-GEN-much-ACC tell-NEG-past
'He didn't tell much about his past.' (Q>Neg, Neg>Q)

b. Kare-wa zibun-no-kako-no-subete-o katara-na-katta
He-NOM his-GEN-past-GEN-all-ACC tell-NEG-past
'He didn't tell all of his past.' (Q>Neg, Neg>Q)

For (48a), the Q>Neg reading is one where there is much that is not told, whereas the under the inverse reading, it is not the case that much was told. Admittedly this is a subtle distinction, but the difference is much more salient in (48b), where nothing was told under the Q>Neg reading, whereas the Neg>Q reading is merely that not everything was told. Again, there is a bit of expository hedging: the word *ambiguous* never actually appears. Neg>Q is given as the primary reading, but the inverse also possible, "though the judgements are subtle" (Kitamoto 1986, p 119). The nature of these subtleties involved in making the judgements is not discussed further.

The interpretation of object quantifiers under the scope of negation is important for Kitamoto's argument, as his main point is to illustrate an asymmetry between subject and object positions in order to push for a configurational phrase structure in Japanese with a VP node. This subject/object asymmetry is shown through a comparison between the forms in (48) and (49):

[16] Glosses of *wa* as nominative case here are copied from the original source.

(49) a. Zen'in-ga repooto-o dasha-na-katta.
All-NOM report-ACC hand in-NEG-PST
'None of them handed in the report.' (Q>Neg)

b. Zen'in-wa repooto-o dasha-na-katta.
All-TOP report-ACC hand in-NEG-PST
'Not all of them handed in the report.' (Neg>Q)

Neither of these two sentences is reported as ambiguous, or even as having a primary reading with a marginally possible secondary. In (49a), the subject quantifier takes scope over negation, which is not surprising, as a quantifier in [Spec, TP] would C-Command any negation element that appears below C^0.[17] (49b) revives the notion that *wa*-marked elements can appear under the scope of negation. Here, the only difference from (49a) is the fact that the nominative case marker has been replaced with *wa*, which results in a complete reversal of the scope interpretation, yielding an unambiguous Neg>Q result. Kitamoto describes this as a function of focus.[18] It is an important contrast for Kitamoto, who claims that the object position, unlike the subject, can be under the scope of negation *without* this focus marker.

These references to *wa* open up the door for an analysis that may not be entirely structurally based; discourse and focus may yet have a role to play.

2.5.3 Focus and Negation

The discourse and focus angle on Japanese negation is taken up by various researchers. Kato (1983) begins with an analysis claiming that negation can take scope over any element in the sentence apart from the subject, following from previous literature which claims that subjects can not be under the scope of negation. This general rule holds unless there is a *wa*-marked nominal, in which case it automatically comes under the scope of negation.[19] So

[17] We assume this to be not surprising as there is as yet no conclusive proof that if a Neg head in Japanese does raise, it would go beyond T^0.

[18] The mechanics Kitamoto employs in order to get negation to scope over the subject position are quite involved. In brief, he develops a system whereby negation scope remains a function of C-Command, but the definition of C-Command to be used changes depending on the content of the sentence (i.e. whether something is being focused or not).

[19] This would seem to be the nearest equivalent to constituent negation in Japanese, as it is not possible to attach negation directly to anything other than a verb or adjective.

far, this is consistent with previous analyses in that the subject position can not ordinarily be under the scope of negation, meaning that negation can not C-Command the subject. Kato's analysis is a departure from Kuno and Kitamoto in that neither a quantifier or a *wa* particle is required for the object position to be under the scope of negation. A quantifier was required by Kuno's definition of negation scope, and always present in Kitamoto's data. Kitamoto does not explicitly say that a quantifier is necessary, but given that he does not give any examples that do not employ quantifiers, it can not be inferred from his work that a quantifier is not necessary. Also, Kato is notable for directly claiming that a given sentence is ambiguous,.

Three years later, in Ota and Kato (1986), negation scope is determined by a linearity condition, where elements take scope over all material to their right. Thus, for Japanese, where negation is always at the end of the sentence, all quantifiers seem to take scope over negation. This applies in the absence of a *wa* particle, which will place the marked element under the scope of negation. In essence, focus overrides structural scope. The following examples and the discussion thereof illuminates just how different things become under this new analysis:

(50) a. Zen'in-ga ko-na-katta.
all-NOM come-NEG-PST
'None of them came.' (Q>Neg)
'Not all of them came.' (Neg>Q)

b. Subete-no-mondai-ga wakar-ana-katta.
all-GEN-problem-NOM understand-NEG-PST
'(I) could understand none of the problems.' (Q>Neg)
'(I) could understand some, not all, of the problems.' (Neg>Q)

In both of these sentences the Q>Neg reading is possible, in accordance with the linearity rule. However, both are apparently ambiguous. This is something very new: subjects apparently under the scope of negation without any focus particles. For these specific examples, the availability of Neg>Q is explained by thinly described contextual and aspectual factors overriding linearity. However, the authors do generally claim that universal quantifiers are more likely to be interpreted as negated in a negative sentence, which seems to re-enforce the notion of Neg>Q being the primary reading. Toward the end of the decade in Kato (1988), he claims that the relative scope of negation and quantifiers is not determined by the structure, and that the resolution of ambiguity lies purely in the sphere of discourse.

In later works, Kato brings his argumentation firmly into the structural realm, leaving behind focus and linearity. Kato (1993) uses the fact that Japanese negation is mandatorily inflected to argue that Neg enters the Japanese phrase structure as an adjunction to T^0. Further, he posits a conditioned T^0-to-C^0 raising to account for cases where the subject is under negation scope. This is not the only such claim in the literature, as Sugai (1993) likewise claims that T^0 is the origin of negation. There, Sugai unequivocally states that the scope of negation includes all of VP, including all case-marked NP's therein, but the raising to C^0 is ruled out in that analysis by a reported unavailability of readings where negation takes scope over subjects. The adjunction to T^0 analysis is not explored here, as we have already provided data supporting the notion that negation is a head in Japanese,

Naomi Hanaoka McGloin's focus and discourse work is somewhat unique in that it provides a treatment of what has thus far been called *wa* negation. McGloin (1986) uses the following example to illustrate the scope of negation relative to a quantifier in this sentence type:

(51) Takusan-no-gakusei-ga ki-wa shi-na-katta.
all-GEN-student-NOM come-TOP do-NEG-PST
'Not many students came.' (Neg>Q)

Based on this and examples covering the interaction between negation and adjuncts, McGloin finally concludes that negation takes scope over the entire sentence in this construction. The judgements given by McGloin are in line with those found in Ota and Kato (1986), where there are examples using object quantifiers and *wa* negation, though they are not the focus of the discussion there.

Returning to the matter of nominals marked with *wa*, McGloin (1986) provides a more thorough analysis of the implications of using *wa* versus a regular case marker, being forced to define two different types of *wa*: thematic and contrastive.[20] McGloin echoes Kuno's claim that thematic elements can not be under the scope of negation, because of their discourse-old nature. Contrastive *wa* is however a different beast entirely. This represents new information which stands in contrast to some other explicit or implicit proposition and is in fact the target of negation. The lack of this distinction is most likely the root of Kuno's

[20]The terminology here is from McGloin. Thematic *wa* seems to be more in keeping with the definition of *wa* as a topic marker, whereas the nature of contrastive *wa* seems to be closer to what is generally known as 'focus,' new information in the sentence. (Nancy Hedberg, personal correspondence)

earlier claim that negation of *wa*-marked elements was a myth: it is simply that contrastive elements *must* be negated in a negative sentence, while thematic elements can not. This explains Kato's contradiction of Kuno over the matter of *wa*: they were each referring to different types of *wa*.[21]

There is further analysis on the interaction between *wa*, Neg, and quantifiers in Japanese, but the conclusions drawn from the data seem to be predictable from the analysis as already described, and so do not present any new facts. Some additional data is presented with reference to object quantifiers and plain negation, but the facts presented suffer from a lack of clear explanation:

(52) a. Taroo-wa uchi-no-mado-o zenbu ak-ana-i.
Taroo-TOP house-GEN-window-ACC all open-NEG-NPST
'Taroo did not open all the windows of the house.' (Q>Neg, Neg>Q)

b. Sensei-wa gakusei-o minna shootai-shi-na-katta.
teacher-TOP student-ACC all invite-do-NEG-PST
'The teacher did not invite all the students.' (Q>Neg Neg>Q)

c. Kinoo shukudai-o zenbu shi-na-katta.
yesterday homework-ACC all do-NEG-PST
'I didn't do all my homework yesterday.' (Neg>Q)

d. Uchi-no-kodomo-wa gohan-o zenbu tabe-na-i.
home-GEN-child-TOP meal-ACC all eat-NEG-NPST
'My child does not eat all the meal. (Neg>Q)

The first two sentences of (52) are given as being ambiguous between total and partial negation, although a preference toward partial negation, is cited (McGloin 1986). For the final two examples, apparently only partial negation readings are possible. However, this difference is not ascribed to anything structural, but rather to the unique semantics of the objects. Further, these data may not be useful for an analysis trying to place negation within the phrase structure, as the location of the quantifiers in the phrase structure of these sentences is not certain. The accusative case marker intervenes between the noun and the quantifier, opening a position where other material, such as an adverb, could be

[21] In retrospect, Kuno's "multiple choice focus" may be a reflection of the contrastive vs. thematic distinction, as defined by McGloin. Where he says thematic elements can not be under the scope of negation, this would be those marked with thematic *wa* and the multiple choice focus could be contrastive *wa*, a conclusion hinted at by Yatabe's definition.

inserted. With this uncertainty, the quantifiers could enter into a different scope relation with the negation than the object phrase itself (McGloin 1987). We will have more to say about this problem in the next chapter.

Yatabe (1996) also attempts to use focus as a means of determining negation scope, taking the familiar tack of building on the apparent inadequacies of Kuno's analysis. He claims that the scope of negation is over the entire vP: the verb stem, all of its arguments (including the subject presumably, as he makes reference to the VP-Internal hypothesis), and some adjuncts:[22]

(53) Kinoo-wa [san-ji-choodo-ni yuubin'ya-san-ga ko]-na-katta.
yesterday-TOP three-hour-exactly-at mail carrier-NOM come-NEG-PST
'The event of "a mail carrier coming exactly at 3:00" did not happen yesterday.'

Yatabe takes the entire string from *san* to *ko* to be within the scope of negation. Given that the tense marker is not under negation's scope, it can be inferred that negation in Yatabe's analysis is no higher than T^0.

In further discussion however, he ascribes an even wider scope to quantifiers, taking scope over their entire clauses, thus always predicting Q>Neg readings. He then mentions an ambiguous case:

(54) Gakusei-ga zen'in ko-na-katta.
student-NOM all come-NEG-PST
'None of the students came.' (Q>Neg)
'Not all the students came.' (Neg>Q)

Firstly, this is interesting in that it seems to be another case of a researcher disagreeing with the claim that subjects can not be under the scope of negation. Secondly, given that his theory predicts Q>Neg readings only, the availability of Neg>Q here requires some discussion. Yatabe's only explanation is that it can be argued that the phrase *zen'in-ga* is not quantificational at all, but rather a plural noun phrase. It is then left to the reader to determine what effect this re-analysis would have; presumably the element that is no longer a quantifier would now have a narrower scope than negation, thus yielding an equivalent to Neg>Q. Setting aside Yatabe's analysis, a simpler challenge to this example would be the same one McGloin leveled against some of her own examples. Given that the case marker

[22] This is a structural translation of the notion Yatabe describes as "infinitival portion".

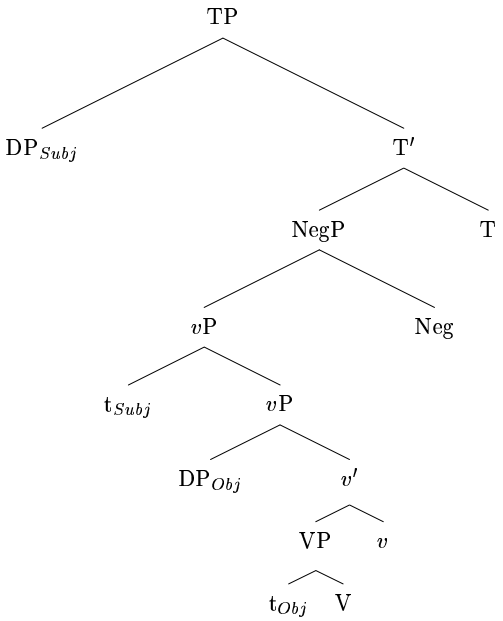
is between the noun and the quantifier, this could be another case where the quantifier may or may not be at the same structural position as the subject noun.

At any rate, the picture emerging after a brief discussion of these less structurally-grounded examinations of negation scope is decidedly muddier. While it would be one thing to find minor differences between researchers, accounts have so far been identified which cite Neg>Q as being the primary interpretation for the relationship between negation and object quantifiers, others citing Q>Neg only, and still others claiming that ambiguity is possible, dependent on various non-structural factors, including the choice of quantifier. The presence of *wa* makes things particularly difficult, although the differentiation between contrastive and thematic *wa* does make the matter somewhat clearer. Given the unanimity of judgements concerning what looks like contrastive *wa* in the subject position, it may need to be conceded that Scope Rigidity bends in the presence of contrastive *wa*. However, echoing Ota and Kato (1986), where there is no overt focus, structure should still prevail.

2.5.4 Miyagawa

One last thorough analysis of Japanese quantifier scope comes in Miyagawa (2001). Here, Miyagawa uses scope judgements to motivate an argument on the syntactic structure of Japanese, which is what the present study would like to be able to do. The biggest difference in Miyagawa's work, compared to the previous authors, is that he begins with a clear assumption of the structure of negation, and frames all of his arguments in terms of that assumption. Miyagawa is one of the higher-placement camp, where NegP is a projection of a Neg^0 head between v^0 and T^0, as illustrated in (27), repeated below as (55):

(55)



Miyagawa begins with an observation of the generally accepted dichotomy between subject and object quantifiers with regards to negation: objects can be under the scope of negation, subjects can not. However, he does not use this to establish anything about the structure or position of negation, rather he uses it to establish that subjects in Japanese raise out of vP into the [Spec, TP] position.

Miyagawa's data is somewhat rare in that it treats sentences that are not in the canonical word order:

(56) a. Zen'in-ga sono tesuto-o uke-na-katta.
all-NOM that test-ACC take-NEG-PST
'All did not take that test.' (Q>Neg)

b. Sono tesuto-o zen'in-ga uke-na-katta.
that test-ACC all-NOM take-NEG-PST
'That test, all didn't take.' (Q>Neg, Neg>Q)

Dealing first with (56a), this sentence is given as unquestionably unambiguous: the subject quantifier takes scope over the negation, and the only possible reading is one where nobody took the test. For (56b), Miyagawa provides two readings: the primary one seems to be partial negation where the quantifier is under the scope of negation, but there is also a second reading, marked as somehow conditional. The reading where it is not the case that all students took the test is most salient, while the conditional one is the reading where no

student took the test. What remains unclear is whether this conditionality is an indication that some speakers have both readings available, or a matter of one or the other, varying from speaker to speaker.[23]

Another matter examined by Miyagawa is that of *ga*-marked objects:

(57) a. Taroo-ga zen'in-o oshi-rare-na-katta.
Taroo-NOM all-ACC teach-can-NEG-PST
'Taroo wasn't able to teach all.' (Neg>Q, Q>Neg)

b. Taroo-ga zen'in-ga oshi-rare-na-katta.
Taroo-NOM all-NOM teach-can-NEG-PST.
'Taroo wasn't able to teach all.' (Q>Neg)

Unlike (56b) which had an OSV order, the lower *ga*-marked phrase is considered to be at [Spec, TP] through a double agreement structure whereby nominative case is checked twice (Miyagawa 2001). This is justified by the scope judgements: for (57b), a Neg>Q reading is impossible, indicating that the quantifier is higher than negation. However, it is the judgement for the first sentence that is more interesting. In terms of establishing that the *o*-marked object of (57a) is lower than the *ga* marked object of (57b), the availability of a Neg>Q reading is taken as sufficient proof. Miyagawa does not specifically report (57a) as an ambiguous sentence, but rather says that a Q>Neg reading is possible for some speakers. On the surface, this is similar to the claims made by other researchers, but Miyagawa is unique in claiming that the particular reading is available only for some speakers; others have used such hedges as claiming that the relevant judgements are subtle, which seem to imply that the ambiguity is subtly possible for the entire population.

2.5.5 The Overall Picture of Negation Scope

As has been illustrated through this review of literature on negation scope, the picture which emerges is definitely not clear. According to early research, negation takes scope over just the verb, but exceptions are made for quantifiers. This claim seems to be especially suspicious, as it seems unlikely that the scope of negation should be determined by the content of the elements it may or may not scope over. That being said, it is quite clear that negation is sensitive to some discourse functions, such as theme and contrast as marked

[23]For a refutation of the possibility that this ambiguity is a result of a possible analysis involving scrambling, see Miyagawa (2001).

by *wa*. The accounts of this type of ambiguity are fairly thorough, although the matter of negation scope changing in *wa* negation is somewhat more interesting. In those cases, the sparse literature seems to agree that negation should always take the widest possible scope.

However, even examining just the data where contrastive *wa* does not seem to be active, the picture of plain negation scope remains thoroughly unclear. There seems to be general agreement that negation can take scope over an object, but the inverse is cited as at least possible by some researchers, and possibly to the exclusion of the so-called primary reading. Furthermore, there is even some research which claims that negation can take scope over the subject, which flies in the face of the generally accepted contrast between subject and object positions in Japanese with respect to negation scope. Finally, phrasing such as that used in Miyagawa (2001), the explicit reference to some readings only being available for some speakers, highlights the fact that it is unclear whether the reported ambiguities are really ambiguities for a single speaker, or whether different native speakers have conflicting judgements on sentences they individually believe to be unambiguous.[24]

At this point, it may seem that another potentially valuable source of evidence concerning the placement of negation has been overlooked: the licensing of negative polarity items (NPI) in Japanese. This data has not been explored, as it does not seem to be parallel to negation scope. Recalling that there is a debate as to whether the subject position can be under the scope of negation without contrastive focus marking, there is no debate on the licensing of NPI's in this position. Judgements on this matter are quite stable, with Japanese being noted as distinctly different from English in that NPI's are indeed licensed in the subject position. Kato (1993) proposes an analysis where NPI's are licensed via a feature-checking mechanism between negation at T^0 and its specifier position. Non-Subject NPI's would move covertly into this checking relation. The analysis is in keeping with his treatment of scope in that negation is at T^0, but it calls for a totally different mechanism: checking in Spec-Head relationship for NPI's versus C-Command for scope. As it seems that NPI licensing uses a separate mechanism which requires covert movements of elements, NPI licensing data will not reveal any hard evidence on the placement of negation. If the NPI facts were equally as inconsistent, then they might warrant further study, but the consistency itself is a strong indicator that whatever mechanism deals with NPI licensing is not the same one that deals with determining the scope of negation.

[24]Does A say "either x or y", or does Speaker A say "x and only x" and Speaker B "y and only y"?

This confusing state of affairs in the literature has not gone unnoticed. While Miyagawa used scope judgements to motivate a claim for Japanese verb raising, Fukui and Sakai (2003) note that an earlier study used scope judgements to reach the opposite conclusion. They are quite clear in claiming that arguments based upon scope phenomena are "quite controversial because the primary data with respect to scope interpretations do not seem to be solid enough" (Fukui and Sakai 2003, p 333). Given this condemnation, and after an examination of the relevant data, it seems that using negation scope to motivate an argument for the position of negation in Japanese phrase structure is little more than a fool's errand. However, instead of abandoning this idea as Fukui and Sakai do, it should be possible to use a more thorough investigation of Japanese negation scope to answer not only the question of the structure of negation, but in so doing also reach a principled account of what exactly is the cause of this disagreement in the literature.

2.6 A Possible Solution

Throughout a review of the literature on Japanese, one unrelated theme emerges: in many cases, arguments for a certain piece of syntactic reasoning which work in Japanese will work in Korean, and vice versa. This is hardly surprising, since the two languages are both so structurally similar. While it is true that there are differences in the way negation is done in each of these languages (Korean plain negation is prefixal, not suffixal), both are head-final languages with largely similar syntactic processes.

Another commonality shared by these languages is the fact that the body of research on negation scope is unclear. The same disagreement among researchers illustrated above in Japanese has been cited in work on Korean (Han et al. 2003). In their study, Han, Lidz and Musolino take the position that the reason scope judgements are so confused is that the data presented is somewhat *ad hoc* and not really based on systematic investigation. In this, they echo Fukui and Sakai who note the flimsiness of the data presented.

A controlled investigation of the interaction between quantifier and negation scope may in fact reveal the underlying processes only hinted at by the anecdotal judgements cited in previous research. This is the course of action taken in Han et al. (2003) for Korean, and it is in this direction which the current investigation into Japanese will proceed.

Chapter 3

Designing an Experiment to Test Scope Judgements

Having established the importance of scope judgements to the question of Japanese negation structure, and the research on this matter having been shown to be unclear, a psycholinguistic experiment was designed in order to elicit scope judgements in a reliable fashion. The general form of the experiment is similar to that used by Han et al. (2003), but the conversion of the experiment from Korean to Japanese introduces new problems to be solved. Prime among these is the crafting of the test stimuli to be used in the experiment, and the manipulation of the experiment to filter out external factors which may taint the results. This chapter begins with a broad discussion on the topic of psycholinguistic experimentation as a tool for syntactic research, then moving through the design of the current experiment on Japanese.

3.1 Why Experiment?

The major condemnation of scope judgements cited by Fukui and Sakai is that the data, as presented, formed an insufficient basis upon which to make a claim about syntactic structure. To use a simple term, the quality that these data lack is that of soundness. There are two major ways in which the scope judgements presented in the previous chapter can be cited as unsound: one of them strikes at the deeper notion of using judgements at all, and the other has to do with the manner of the data collection, and the presentation thereof.

3.1.1 Judgements

The first attack upon the use of scope judgements is a fundamental one. While a phonetician has an array of tools available to measure the acoustic qualities of an utterance, yielding quantifiable data which can then be subject to systematic analysis, at the end of the day, the only data syntacticians have to works with are judgements. One could make recourse to a corpus study, but there is no guarantee that a corpus contains all the possible grammatical forms of a language, and thus the matter comes back to judgements. Furthermore, if judgements as to the meaning of a sentence are needed, a corpus-based study would require the researcher to make a judgement as to what the author of a given sentence meant. Again, we are back to judgements.

Unfortunately, a judgement-based approach is fraught with potential pitfalls. The most ardent cynic can simply ask whether or not the informant is being honest in the judgements reported. This is indeed a matter with which researchers can not do much more than have faith that the participants are indeed being truthful. Short of asking questions while people are under simultaneous polygraph analysis, there is no way to control for this possibility.

Judgements, or 'intuitions', are subject to attack on another type of reliability. Studies have been produced which demonstrate that when surveyed for grammaticality judgements, there can be widespread disagreement within a supposedly homogeneous population, and individuals can even disagree with themselves when the same test is administered twice. Be that as it may, the fact that there are also studies illustrating the opposite, that judgements can indeed be consistent within a population and relatively stable, is taken as sufficient grounds for justifying the use of judgements in research. Indeed, if we pause to reflect that there could never be a totally homogeneous group all speaking exactly the same language, the fact that there are consistently stable judgements becomes even more impressive. These stable judgements would then seem to be indicators of core grammatical phenomena which are not subject to individual variation.[1]

3.1.2 Means of Reaching Meaning

The other major challenge to the use of judgements in linguistic research is the means in which they are elicited. In most syntactic research, especially where the researcher's native language is the object of investigation, the starting point will usually be the researcher's

[1] For a much more thorough discussion of this issue, see Cowart (1997).

own intuitions about a particular sentence. This can lead to the creation of self-judged grammatical sentences which have never actually been uttered, being used as data to prove or disprove a given point. The next step would be what Cowart (1997) calls the "Hey Sally" approach, in which judgements from others are obtained through very informal and usually undocumented means. While every syntactician most likely uses this approach to some degree or other, and it can suffice where judgements are clear, in the face of the confused data surrounding negation and quantifier scope in Japanese, recourse to a more formal methodology is definitely called for.

Taking Miyagawa's study as an example, he leaves several important questions unanswered. While the fact that he evidently contacted more than one native speaker of Japanese is a step in the right direction, there is no indication of how many, or under what conditions. Where he cites potential ambiguities, no hard numbers are given, merely unqualified claims that alternative interpretations are available to some speakers. Without the details of how many people were contacted, 'some speakers' could represent anything from one out of a hundred, to one out of three.

Also, there is no mention of how the judgements were elicited. It is surely not inconceivable that a native speaker's judgement of a sentence may vary depending on whether the question is asked verbally, face-to-face, with the requirement of an immediate answer, or if the question is posed in a trans-oceanic e-mail with an indeterminate amount of time given to answer. Matters of time aside, even the different manners of presentation, verbal versus written, can have an impact. Context is a vital, if not the most vital, consideration, as judgements on a given sentence can depend greatly on the context in which the sentence is taken to be uttered.

There are certain basic assumptions of psycholinguistic research which are not addressed in these informal studies. The first and foremost is that in any study, the more participants, the more reliable the research. While it is possible that studies like Miyagawa's are representative of a wide survey of native speakers, no actual numbers are given, so a determination of the validity of the results relative to this consideration of sample size can not be made.

Another word which comes up again and again in discussions of research is control. As noted above, Miyagawa's informal approach has none of the controls over context, time, or presentation which form the backbone of solid empirical research. Replicability is another key consideration. Notes must be taken, records must be kept, and all facts on the collection of the data dutifully reported so that the claims made can either be confirmed or refuted

by an objective second party.

Finally, a methodical investigation with appropriate experimental controls and quantifiable results can achieve the desired soundness by the means of demonstrable statistical significance. Even the most minor observed trend in a given set of data can be treated with greater seriousness if it can be demonstrated to be statistically significant. Thus, the goal for the researcher now becomes clear: find a controlled way to elicit judgements from which sound, statistically significant conclusions can be drawn.

3.2 Truth Value Judgement Task

While it would be possible to collect data merely by presenting the same set of sentences to a number of different people and comparing the results in a more structured way than undertaken by the researchers mentioned in the previous chapter, more inventive means of eliciting quantifier scope judgements do exist. The Truth Value Judgement Task (TVJT), as discussed in Crain and Thornton (1998), was developed to elicit exactly these kinds of judgements from children. The fact that this test is designed for children is quite significant, as it allows for a greater range in research possibilities: a test designed for children can be used with adults, whereas an adult test is not always suitable for children. Should contrasting age groups be tested, the applicability of the task to any age group is a valuable control. Bear in mind that the description of the basic set-up was designed for work with four-to-five year old children; many of the modifications to the methodology discussed in the following sections were designed to make the task more adult-friendly.

TVJT allows experimenters to present ambiguous sentences to their research participants in a carefully-controlled context wherein the potential ambiguity can be manipulated; that is, ambiguous sentences are presented in a context where only one of the possible meanings of the sentence should obtain. This has a significant advantage over the traditional means of simply asking for a judgement, whether dealing with adults or children. Given an ambiguous sentence, participants may only report one reading, despite the possibility of having more than one available. Furthermore, the test places little memory load on the participants, and the actual task they must perform is a simple one. The TVJT is not a test to elicit scope judgements *per se*; it is a means of directly testing whether or not a participant has a specific, researcher-controlled, reading available. Matters of primary and secondary readings do not arise: it is simply a matter of yes or no. Or to be more accurate, true or false, as the

ultimate question boils down to a matter of whether or not the given sentence is true in the associated context. If the response is true, then the reading associated with the context is said to be available to the participant. Conversely, if the participant claims the statement is false, then the reading is assumed not to obtain, and the grammar does not generate a structure where the stimulus sentence is true.

TVJT can be implemented to test a wide variety of syntactic phenomena which are characterised by ambiguity. This can include matters of binding, various movement phenomena, and quantifier and negation scope. The question of relative scope between quantifier and negation has been successfully tested using TVJT in Lidz and Musolino (2002) for English and Kannada, and in Han et al. (2003) for Korean, which indicates that TVJT is a good way for this study to proceed.

The actual TVJT test is carried out by two experimenters working with one participant at a time.[2] The first experimenter, the actor, is the only one who interacts directly with the participant. The actor is accompanied by the second experimenter, the observer. The observer communicates only through a puppet or large plush toy such as Mickey Mouse or Kermit the Frog, and is essentially to be treated as a puppeteer, only being addressed in terms of the character being portrayed. The experiment begins with the actor introducing the observer character to the participant, usually with some sort of disclaimer being made that the observer is not all that observant, or easily confused. This primes the participant to be closely monitoring the observer's statements.

Using small toys and props, the actor will act out a short scenario, having instructed both the participant and the observer to watch carefully. To give an example of a simple scenario, a horse is presented along with a rock and a fence. Acting out the part of the horse, the actor tells a story of how the horse wants to play at jumping, and proceeds to jump over the rock. Then, the horse takes a run up to the fence, but does not try to jump, judging the fence to be too high. Once the scenario is completed, the actor asks the observer to say what just happened. Apart from the occasional back-channel cue, this is the only time the observer speaks, giving a one-sentence summary of the scenario. For example, the observer could say, "the horse jumped over the fence." Now the attention turns to the participant, who must give the truth value of the observer's statement. In the case described

[2]It is possible to collapse the functions of both experimenters into one person, but the experiment is best carried out with two people.

above, the answer should be "false", as the horse did not jump over the fence. Whenever the participant gives an answer of "false", the actor then asks for an explanation of where the observer went wrong.

The example given above would be a model of a training trial, as there is no room for ambiguity. It is valuable to start with such transparent examples, as it allows the experimenters to ensure that the participant understands exactly what is required. In the actual test trials, the observer will utter sentences which, in isolation, would be potentially ambiguous. For example, a simple test scenario involves Donald Duck and some fruit. The actor, playing as Donald Duck, first eats three pieces of watermelon, then two out of three pieces of orange. The image at the left in Figure 3.1 illustrates the beginning of the scenario, where all the food is laid out in front of Donald. In the final state, shown at the right, all of the items Donald has eaten are behind him, and the lone uneaten orange remains in front.

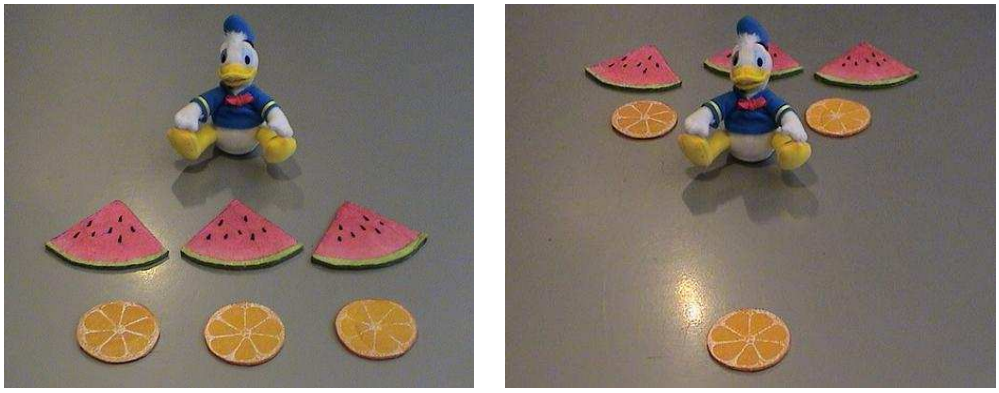


Figure 3.1: Start and end states in a test scenario.

Once the action is complete, the actor prompts the observer, who says "Donald didn't eat every orange." This sentence is ambiguous between a Q>Neg and a Neg>Q reading, but in the given context, it should only be true under the partial negation (Neg>Q) reading. Thus, if the participant says the statement is true, then the Neg>Q reading is available. Should the participant give the opposite response, then it can be concluded that the participant's grammar does not yield a Neg>Q structure.

In order to forestall any priming effects, filler trials should be included in this task. While the data generated by these trials may not be directly used, these trials can be put to some constructive use. For example, in a study like the present one, the filler trials can be

used to unambiguously test the participant's comprehension of negation and the quantifier being used in the test trials. Another valuable manipulation that can be carried out with the fillers is to ensure that there will at least be some controlled variation in the truth values of the observer's answers. With the fillers, it can be directly engineered such that observer is sometimes right, and sometimes wrong, reinforcing the need for the participant to pay close attention. Also, such transparent questions allow the experimenters to "size-up" their participants: if enough unambiguous fillers are missed, then a participant may be dismissed from a study due to unsuitability in the same way that someone who fails a hearing screen may be dismissed from a perceptual study.

Crain and Thornton (1998) also provide some discussion of the strengths and weaknesses of this experimental design. TVJT has one very important implication, especially for child participants: if the experiment is well-executed, participants should not feel as though they are being scrutinised, rather serving more as a consultant than the actual object of the research. Unfortunately, the experiment does rely on a potentially problematic Gricean assumption about the judgements of the participants. It is quite likely that some of the target sentences will be true under one reading and false under another; however, the design assumes that the participant believes the observer to be trying to make a true statement. Therefore, the participant should give the observer the benefit of the doubt, and respond "true" if at all possible. False responses should only be obtained when the reading that corresponds to the scenario given is not at all available to the speaker, and not whenever the scenario merely does not correspond to any primary or preferred interpretation.[3] A more practical drawback noted by Crain and Thornton is the time it takes to conduct the experiment itself. In one 30 minute session, they claim that eight to twelve scenarios can be presented, split among the necessary training, filler, and test stimuli. Thus, given the time constraints, running a TVJT experiment with a large number of participants can turn into a very costly venture.

In order to collect scope judgements from Japanese adults, we made some modifications to the TVJT methodology as presented by Crain and Thornton. These were made in order to deal with three basic concerns: increasing control, streamlining the process, and making the whole process feel more suitable for adult subjects. Rather than present a list of these changes, they will be discussed point by point through the description of the overall design

[3]For a more thorough discussion of this issue, see Crain and Thornton (1998) or Lidz and Musolino (2002).

process for this experiment.

3.2.1 Selecting the Scenarios

The selection of the scenarios was largely pre-determined. In order to make it possible to draw conclusions from the results of this study as compared with the results of the Han et al. (2003) study on Korean, the same test scenarios were used, although there was some variation in the filler scenarios.

As noted above, the training scenarios can be utilised to ensure that the participant has a clear understanding of exactly what the responses should be based upon. With this in mind, a specific contrast was introduced into the training section in hopes of eliminating one other possible source of ambiguity in the sentences. Notions of modality are potentially confounding factors which could colour the responses of the participants. When the observer makes a claim that a character in a scenario did not perform a certain action, and the character indeed did not carry out that action, the participant could still respond that the statement is false based upon the fact that the character did try.

To eliminate this possibility, the above-described scenario with the horse jumping over a rock but not a fence was used. Here, a slight modification was made to the design, as the observer was given two chances to make a statement about the same scenario. The first claim was that the horse did not jump over the fence. This could only elicit a response of false either in a case of severe miscomprehension, or where the participant is getting confused between *couldn't* and *didn't*. When prompted to explain why the statement was false, the offending participant could be corrected if their justification is something along the lines of "...but the horse *tried*." To reinforce the point, the sentence "The horse didn't jump over the rock" is also given with the same scenario. This sentence is transparently false, and is used to make clear the notion that responses of "false" should be based only upon observed facts, and not upon matters of modality.

There is one other aspect of the test scenarios which is worth noting. In all the cases where there is potential ambiguity, such as with Donald and his oranges, the object of the ambiguous sentence was contrasted in the scenario with some other set of items to all of which the relevant action was performed. In the Donald scenario above, he eats all three pieces of watermelon before eating two of the three orange pieces. While superfluous to the final sentence being tested, this contrast was included to increase the saliency of the quantified element actually being tested.

3.2.2 Creating the Sentences

Again, the sentences themselves were drawn largely from the previous study on Korean, but some alterations had to be made for Japanese. At a basic level, all the sentences had some similarities. Examples of the test sentences with plain and *wa* negation, and all the permutations of fillers are given in (58):

(58) a. Plain Negation Test

Donarudo-ga orenji-subete-o tabe-na-katta.
Donald-NOM orange-all-ACC eat-NEG-PAST
'Donald didn't eat every orange.'

b. *wa* Negation Test

Donarudo-ga orenji-subete-o tabe-wa shi-na-katta.
Donald-NOM orange-all-ACC eat-TOP do-NEG-PST
'Donald didn't eat every orange.'

c. Plain Negation Filler

On'nanohito-ga Lisa-ni kagami-o ur-ana-katta.
woman-NOM Lisa-to mirror-ACC sell-NEG-PST
'The woman didn't sell the mirror to Lisa.'

d. *wa* Negation Filler

On'nanohito-ga Lisa-ni kagami-o urai-wa shi-na-katta.
woman-NOM Lisa-to mirror-ACC sell-TOP do-NEG-PST
'The woman didn't sell the mirror to Lisa.'

e. Subject Quantifier Filler

Kyooryuu-subete-ga kirikabu-kara ochi-ta.
dinosaur-all-NOM tree trunk-from fall-PST
'All the dinosaurs fell from the tree trunk.'

As shown, the test sentences contained single entity subjects. For those fillers which were designed to independently test the comprehension of quantifiers, subject quantifiers were used to avoid any priming effects. In terms of tense, all verbs received exactly the same marking: plain past. Two important considerations for the structure of the test sentences were the choice of whether or not to use *wa* on the DP's, and the placement of the quantifier in the sentence.

In order to avoid any possible effects of focus, none of the stimuli sentences used a *wa* particle on either the subject or the object. While marking the objects with *wa* may have coloured the results, the agents of all the sentences are given and discourse old, so thematic *wa* marking of those elements would be quite natural. Despite this naturalness, *ga* was used on the subjects just in case a *wa* marking might somehow impact upon the perceived negation scope. The resulting sentences are grammatical, if somewhat contextually odd. Furthermore all the stimuli were uttered in a neutral fashion, with no phonetic cues of focus.

Recalling McGloin's problematic examples from Section 2.5.3, the placement of the quantifier in the sentence is extremely important. It is well-documented that Japanese exhibits a phenomenon known as Quantifier Float (QF), which allows quantifiers to appear in various positions relative to the objects they quantify. The following examples, drawn from Ota and Kato (1986) demonstrate this phenomenon:

(59) a. Gakusei-ga sam-bon-no-biiru-o non-da.
student-NOM three-CL-GEN-beer-ACC drink-PST
'The student drank three bottles of beer.'

b. Gakusei-ga biiru-sam-bon-o non-da.
student-NOM beer-three-CL-ACC drink-PST
'The student drank three bottles of beer.'

c. Gakusei-ga biiru-o sam-bon non-da.
students-NOM beer-ACC three-CL drink-PST
'The student drank three bottles of beer.'

As indicated, the meanings of these sentences are claimed to be indistinguishable. Indeed, they claim that these changes may apply freely in any *ga* or *o* marked phrases. However, these sentences will obviously differ to some degree at the syntactic level. For the purposes of the present study, it would be most advantageous to have a structure in which the quantifier is unquestionably a part of the object DP, as this would be the only way to ensure that scope judgements would actually reflect the relative position between the object quantifier and negation. That (59c) is not suitable for this test can be easily shown by the fact that an adverb can intervene between the object and the quantifier:

(60) Gakusei-ga biiru-o hayaku sam-bon non-da.
student-NOM beer-ACC quickly three-CL drink-PST
'The student quickly drank three bottles of beer.'

This leaves (59a) and (59b), both of which will be considered below.

According to the review of works on word order in Japanese noun phrases in Kim (1995), the structure given in (59b) is traditionally considered to be a derivation from the "basic" structure, (59a). In this process, the noun and quantifier swap positions, and the *no* particle is dropped off the quantifier. Kim thus claims that the following two sentences would be related by this same process:

(61) a. Kurokawa tantei-wa genba-de san-joo-no-suiminzai-o
Kurokawa detective-TOP site-at three-CL-GEN-sleeping pills-ACC
hakken-shi-ta
discover-do-PST
'Detective Kurokawa discovered three sleeping pills at the site.'

b. Kurokawa tantei-wa genba-de suiminzai san-joo-o hakken-shi-ta
Kurokawa detective-TOP site-at sleeping pills three-CL-ACC discover-do-PST
'Detective Kurokawa discovered three sleeping pills at the site.'

Kim notes that "[n]ative speakers of Japanese may find no significant meaning differences between the two....even if some semantic differences are perceived, generally such differences would be too subtle to notice" (Kim 1995, p 204). However, Kim follows this with a discussion of these semantic distinctions, leading him to discard a transformational analysis and posit the two as two separate structures.

With this and other distinctions (eight possible NP configurations in all), Kim performs a corpus analysis of just over one thousand Japanese quantifier constructions, drawn from fiction, essays, and folk tales. He also distinguishes between Modern and Old Japanese, leading to some interesting findings. First of all, in the Modern Japanese corpus, out of 858 total quantifier expressions, 45.8% were of the structure illustrated in (59a) and (61a), by far the most popular out of the eight possible structures. On this basis, it would seem that this would be the preferred structure for the purposes of our experiment, as the stimuli should be as non-contrived as possible. Conversely, the structure in (59b) and (61b) appeared a mere 6.4% of the time in the modern corpus, and only 6.7% of the time in the Old Japanese corpus of 208 quantifier expressions. Kim describes the use of this structure as "low to the point of insignificance" (Kim 1995, p 215).

Insignificant though it may be, the slight semantic differences of the structure which emerged through an examination of its occurrences in the corpus may make this structure the best choice after all. Kim notes that this structure is often used anaphorically for

definite references which consist of discourse-old information. In the context of the TVJT task, this would certainly not be a hindrance, and could even support a claim that this noun phrase structure is ideal for our purposes. Finally, Kim suggests that this particular structure might tend to generally appear under the scope of negation, which would further strengthen any case based on a lack of possible Neg>Q readings. Such a finding would have to be a reflection of some structural phenomenon overriding discourse tendencies.

That the noun and quantifier form a constituent is demonstrated by a pair of tests drawn from Kitahara (1993):

(62) a. Taroo-ga hon san-zatsu to pen sam-bon-o kat-ta.
Taroo-NOM book three-CL and pen three-CL-ACC buy-PST
'Taroo bought three books and three pens.'

b. Taroo-ga kat-ta-no-wa hon san-zatsu-o da.
Taroo-NOM buy-PST-GEN-TOP book three-CL-ACC COP
'It's three books that Taroo bought.'

In (62a), the noun-quantifier sequence is shown to be a constituent from the fact that two such sequences can be conjoined. In the second example, constituency is demonstrated through the possibility of clefting.[4] The clinching argument leading to the selection of (59b) as the structure was a simple piece of input from the native speaker who was consulted on this matter: with a universal quantifier, the structure of (59b) simply sounded better than the basic (59a).

Once the scenarios and relevant test-sentences are complete, the next step is to begin working on the means of presentation.

3.2.3 Recording the Scenarios

All that has been discussed so far concerned tailoring the experiment to the specific question being asked about Japanese. At this stage, it now becomes a matter of tailoring the TVJT task to adults. The first major departure from the methods described by Crain and Thornton actually addresses all three issues noted earlier in Section 3.2: increasing control, streamlining the process, and making the experiment more suitable to adult participants. This departure was that all of the scenarios and interactions between the observer and the actor were video recorded. This is an obvious gain on the control front, as there will be

[4]The "basic" structure (59a) and (61a) also passes these tests.

no variation in the stimuli presented to each participant. Without solid adherence to a script, variations could creep into the scenarios in live performances which are obviated by a recorded presentation. The recording of the scenarios also helps in streamlining the process somewhat, as the transition from scenario to scenario can be accomplished without any shuffling of props. Finally, video presentations were judged to be more suitable for adults than having the participants watch two experimenters play with toy cars and a stuffed Mickey Mouse. Unlike children, adults can not easily be fooled into thinking that they are not in fact being tested, so it seems foolish to expend effort on making them think so. The introductory instructions and explanation about the roles of actor and observer were also recorded in a straight-to-camera statement. These instructions (in Japanese) included a disclaimer stating that the task is designed for young children, and should elicit quick, first instinct reactions.

The Han et al. (2003) study also made use of recorded scenarios, which allowed for an impressive streamlining of the process, as the videos were presented simultaneously to groups of 10-20 participants each with individual score sheets. While this would speed up the data collection process and allow for a larger participant base, there is a loss in debriefing possibilities, making it harder to determine for each speaker what exactly forced them to make any false responses.

For this experiment, it was decided that the observer role would be portrayed by a non-native speaker, having had three years of previous instruction in Japanese. The observer's performance was judged by a native speaker to be somewhat accented, but acceptable. The actor role was portrayed by a native speaker of Japanese. It was felt at the time that using a non-native speaker would serve two important purposes in this experiment. First of all, the evident contrast between native and non-native speech could be an immediate red herring for the participants, who might be so concerned by this contrast that they are unaware of what is actually being tested. This is yet another way to avoid the priming effect of having the answers given be influenced by the fact the participant "sees through" the test. The second benefit to using a non-native speaker is that it would most likely increase the reliability of judgements where the participants say the observer's statements were false: given speech by a non-native speaker, participants should be even more inclined to give the benefit of the doubt in trying to ascribe as many true responses as possible.

The scenarios were filmed using a fixed camera under quiet conditions. Emphasis in the recordings was placed upon the scenarios as opposed to the two experimenters; the actor

only comes fully into shot when interacting with the Mickey Mouse toy, and the face of the observer rarely comes into shot at all, though he is visible holding Mickey Mouse. Most importantly, the final resting positions of the toys used in the scenario remain visible during and after the observer's statement, providing a visible basis of comparison for the statement. While the observer is saying "Donald didn't eat every orange" the participant can still see exactly how many oranges Donald ate.

3.2.4 Designing the Interface

Once the scenarios were recorded, a means of presentation was required. While the Korean study had used a television to present the scenarios to a large number of participants at once, a more individual means of presentation was sought for this study. The inspiration for the method used in this study comes from software used in computer-based experiments on speech perception. In these experiments, stimuli are played back over a computer, and participant responses are entered on the same computer and saved for later analysis. The advantages to this method of presentation are threefold: first it provides a single interface for the participant. In the Korean study, participants watched the scenarios on a television, but responded on an answer sheet; using a computer-based method both viewing and responding could be combined into a single unit. Secondly, this method gives participants the ability to proceed at their own pace. In a large group setting, if any participant misses some or all of one of the video scenarios, it is not possible to replay any or all of the scenario. As the experiment is individualized, participants have direct control over all the playback controls, giving them the ability to replay sections if they were unclear. This is an ability which even the live-action version of TVJT lacks, as it would be impossible to reproduce a 100% identical performance. The final benefit to the computer-based experiment is one of sheer convenience. By implementing the experiment on a laptop PC, that PC is the only piece of equipment needed to carry out the experiment.

Having already selected the method for video playback,[5] the next task was to find a way to marry that with the data-collection portion of the experiment. All the participants need to do is answer a series of True/False questions, thus all that is required is a form with some fields for demographic information (or at least participant ID numbers), and answer blanks for each scenario. A web-page like interface was designed in which the page is set up as

[5].mpg files using RealPlayer: free, easy to use, and quick to implement

an empty form, and the individual scenarios accessed by clicking a link. The final design of the interface as seen by participants is given in Figure 3.2. Here, the scenario plays in a separate window overtop of the participant's answer page. The image shown is taken at the moment where the observer is making his statement, and the final resting places of all the toys in the scenario are clearly visible. From here, the participant simply clicks back to the appropriate answer blank and enters a response. At the end of the data collection session, responses are saved for later analysis.[6]

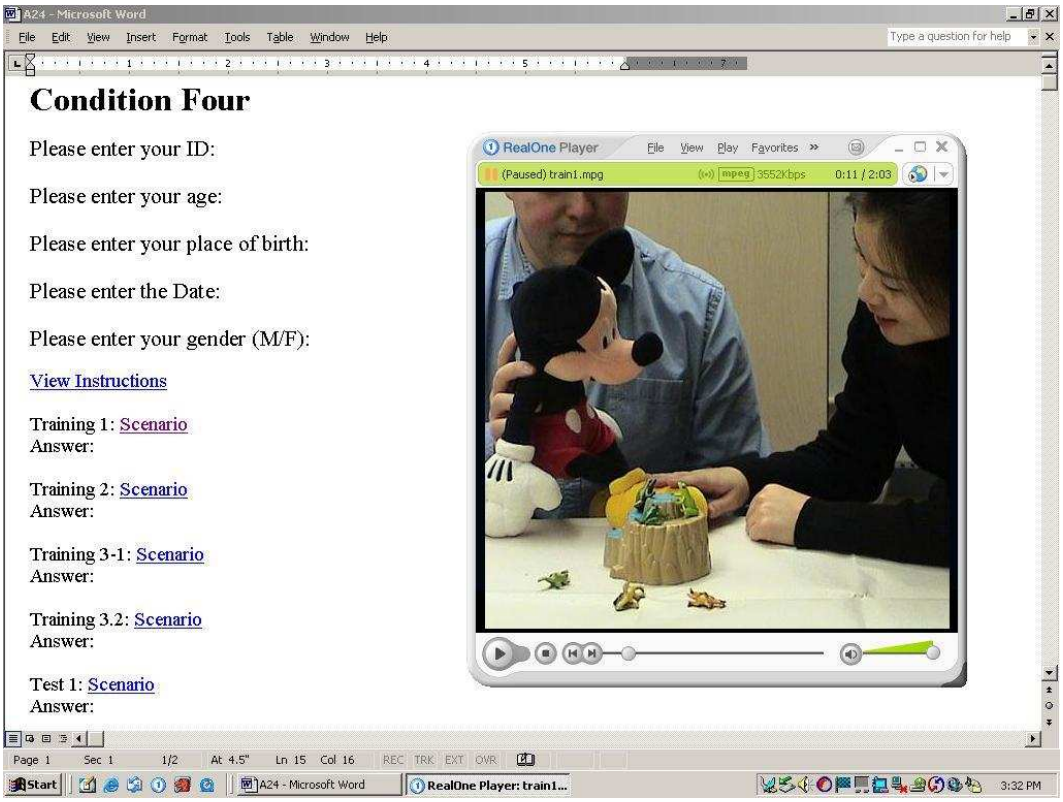


Figure 3.2: Participant Interface.

[6]A truly web-based method was considered for a time, but the necessity of an internet connection would have seriously hampered portability of the experiment, and introduced possible technical limitations.

3.2.5 Debriefing

The fact that the experiment basically becomes a self-directed task means that the post-experiment debriefing does become a bit more elaborate. Unlike in the traditional TVJT method, participants are not asked why they answered false to any given sentence right at the time they enter their answer. However, by conducting the experiment on a one-on-one basis, the possibility of a detailed debriefing does still exist; debriefing in a situation where there are 10-20 people undergoing the experiment simultaneously would be challenging at least.

Using this computer-based approach, the debriefing is split into two portions. First, the participants are given the chance to complete the training scenarios on their own, with no input from the experimenters, unless asked for. After training, experimenters check-in with the participants to ensure that they are comfortable with the task. Also, as the training stimuli are unambiguous, the responses given are evaluated by the experimenter. This is especially important with reference to the stimuli designed to identify any confusions with modality; if a participant is observed to have been answering based on whether an action *could* be carried out, as opposed to whether it was in fact completed, it is corrected at the end of training.

Once the set of experimental stimuli is completed, a more detailed debriefing is conducted. For each false response given, participants are asked why they gave that answer. To prompt a thorough answer, the ending of the relevant video-clip can be re-played. This review process opens up the potential for a participant to change an answer. While this can provide interesting data for a *post hoc* analysis, and the reasoning may be enlightening, to preserve the quality of the data, only first-instinct responses should be considered to be acceptable.

In this particular design, the debriefing also consists of several open-ended questions intended to bring to light any other issues which may have an impact upon the results. Most important is the question "Did you notice anything about Mickey's statements?" This is a very open question, and it is hoped that if having a non-native speaker making the statements is detrimental to the experiment, it would manifest itself in repeated statements of the observer's foreign-ness as response to this particular question. Equally valuable here would be any statements to the effect of citing a non-standard word order for the quantified phrase, or even an observation about the ambiguity of Mickey's statements. In order to get

at the possibility of ambiguity, increasingly direct questions are asked, including whether any of the statements were harder to answer, or indeed whether any of them were ambiguous.[7] While much of the data gathered through the debriefing would be anecdotal and difficult to quantify, it is invaluable in terms of determining exactly why the participants claimed certain statements were false, and in identifying any trends in the responses which could point to a problem in the design.

With this last control in place, and after a few trial runs, the experiment is now ready for the participants.

[7] A full list of the debriefing questions appears in the appendices.

Chapter 4

Conducting an Experiment on Negation Scope

Once the TVJT task was sufficiently customised to the question of determining the relative scope between negation and object quantifiers in Japanese, the next step was to recruit participants and conduct the experiment. This chapter will cover the participant selection and grouping process, as well as report the results, followed by some relevant observations derived from the debriefing sessions.

4.1 Recruiting the Participants

This study was able to benefit greatly from the multicultural nature of Vancouver; being a popular destination for overseas students learning English as a second language, there is a large enough population of native Japanese speakers in the city to conduct a reasonable study. In total, fifty participants were recruited. Two were eliminated from the study, as it became clear working through the TVJT task that the level of miscomprehension was such that their responses could not be reliable. This judgement was made based on poor performance in the unambiguous training and filler trials described in the previous chapter. This left a group of 48 participants on which the final results are based.

4.1.1 Recruitment Criteria

The criteria for selecting appropriate candidates broke down into three major categories: Linguistic, Age, and Other Factors

Linguistic Factors

Given that the vast majority of the target recruitment group would be ESL students, it was expected that they would have some facility with English as well as being native speakers of Japanese. For the participants to have had some knowledge of English was virtually inescapable, as English is widely taught in the Japanese school system. There was no strict requirement against third or additional languages, but there were only few participants reporting a third language.

Age

In order to provide a basis of comparison for any possible future studies with children, an initial decision was made to stipulate that participants should be age nineteen or older. However, the final result was largely determined by the response to the call for participants: in the end, the 48 participants ranged in age from twenty to thirty years of age.

Other Factors

Other criteria were also used in order to limit the amount of exposure to other languages, particularly English. As the experiment was not being conducted in Japan with true monolingual native speakers, these controls were introduced to strike a balance between getting enough participants and getting as near to the true monolingual as possible.

The first of these criteria was that participants had to have received no formal education outside of Japan prior to the age of fourteen. This not only reduced the possibility of an early introduction to English, but also the possible influence of other third languages. The second major criterion was that participants should have spent no more than a total span of one year in North America. There was a great deal of variation within this parameter, as participants ranged in length of stay from just over one year (372 days), to just over one week (8 days).

Another factor which was heavily influenced by the respondents to the call for participants was gender. Ideally, this should be balanced at a fifty-fifty ratio of males versus

females, but this was quickly demonstrated not to be possible, as the vast majority of people responding were women. Of the forty eight participants in the study, there were only five males.[1]

While not a factor in determining suitability for the experiment, one other piece of information was collected from the participants: their home prefecture in Japan. Just over one fifth of the total participant population is from Tokyo, but on the whole a wide cross-section of the country is represented in this study.

4.1.2 Group Assignments

In order to understand the group assignments for this study, it is worthwhile to briefly restate the research goals. Ambiguous sentences in Japanese are being tested in order to see whether participants have a particular scope reading available: Neg>Q or Q>Neg. These scope readings are both tested against two possible forms of negation: plain negation or *wa* negation. This results in a 2x2 design, with the population being subdivided into four groups, as shown in Table 4.1.

	Q>Neg	Neg>Q
Plain neg	n=12	n=12
wa neg	n=12	n=12

Table 4.1: Experimental Design

Participants were assigned to groups pseudo-randomly, based upon the order in which they responded to the call for research participants, with efforts being made to distribute the males equally.[2]

For discursive purposes, the groups are numbered as follows:

Group 1: Plain Negation-Q>Neg
Group 2: Plain Negation-Neg>Q

[1] Given the nature of the research, we discount this as being a major factor on the results.

[2] There was only one conscious manipulation of the group assignments: when the opportunity arose to test a pair of sisters back-to-back, the normal group assignment algorithm was interrupted in order to see whether the two sisters would pattern in the same way in the group which, to that point, had been demonstrating the most inconsistent results.

Group 3: *wa* Negation-Q>Neg
Group 4: *wa* Negation-Neg>Q

Also, the terms "group" and "condition" will be used interchangeably in the discussion to follow.

4.1.3 Data Sessions

Data collection took place over a six week period at both the Simon Fraser University Burnaby and Harbour Centre campuses. In both cases, the research was carried out in a quiet location, such as an empty classroom or office. Every effort was made to keep distractions to a minimum, which included trying to keep the researchers out of the peripheral vision of the participants while they worked on the laptop, in hopes of minimising the awareness of being under observation.

For participants in all groups, the session began with a presentation of the recorded instructions, followed by four training stimuli. Once these were complete, a mini-debriefing was conducted, as discussed in Section 3.2.5, in order to ensure the participant understood and was comfortable with the task. This was followed by the presentation of the eight experimental stimuli, consisting of four test stimuli and four filler stimuli given in the following pseudo-random order:

Test 1
Test 2
Filler 1 (Negation Test)
Test 3
Filler 2 (Negation Test)
Filler 3 (Quantifier Test)
Test 4
Filler 4 (Quantifier Test)

Like the test stimuli, the filler stimuli were manipulated according to group: for Groups One and Two where plain negation was being tested, the fillers testing negation used *wa* negation, and the reverse was done for Groups Three and Four. This choice was made to eliminate any possible priming effects resulting from repeated use of the same negation

form. Similarly, the fillers testing the comprehension of quantifiers used subject quantifiers as opposed to object quantifiers.[3]

4.2 Results

The results of the study are most meaningfully interpreted using a first split along the negation-type axis, then identifying the scope possibilities for each. Results for plain negation are presented first, followed by *wa* negation. Then, the overall results are discussed, ending with a discussion of some findings from the debriefing.

4.2.1 Scoring the TVJT Test

Before discussing the actual quantified results, the scoring system for the test stimuli must be discussed. Using standard binary notation, whenever a participant claimed a sentence was true, that response was scored as one and responses of false were scored as zero. In order to arrive at the group averages, each participant's score out of four was converted to a percentage, then the arithmetic mean of the twelve percentage scores was taken to determine the average score of the group.

4.2.2 Results by Group

The overall results from the experiment are summarised in Table 4.2 and Figure 4.1.

	Q>Neg	Neg>Q
Plain neg	98% True, 2% False	54% True, 46% False
wa Neg	98% True, 2% False	94% True, 6% False

Table 4.2: Percent "true" and "false" responses by group.

Even before launching into any meaningful discussion, it seems clear that there is something interesting happening in Group Two.

[3] A full listing of all scenarios and associated stimulus sentence is presented in the appendices.

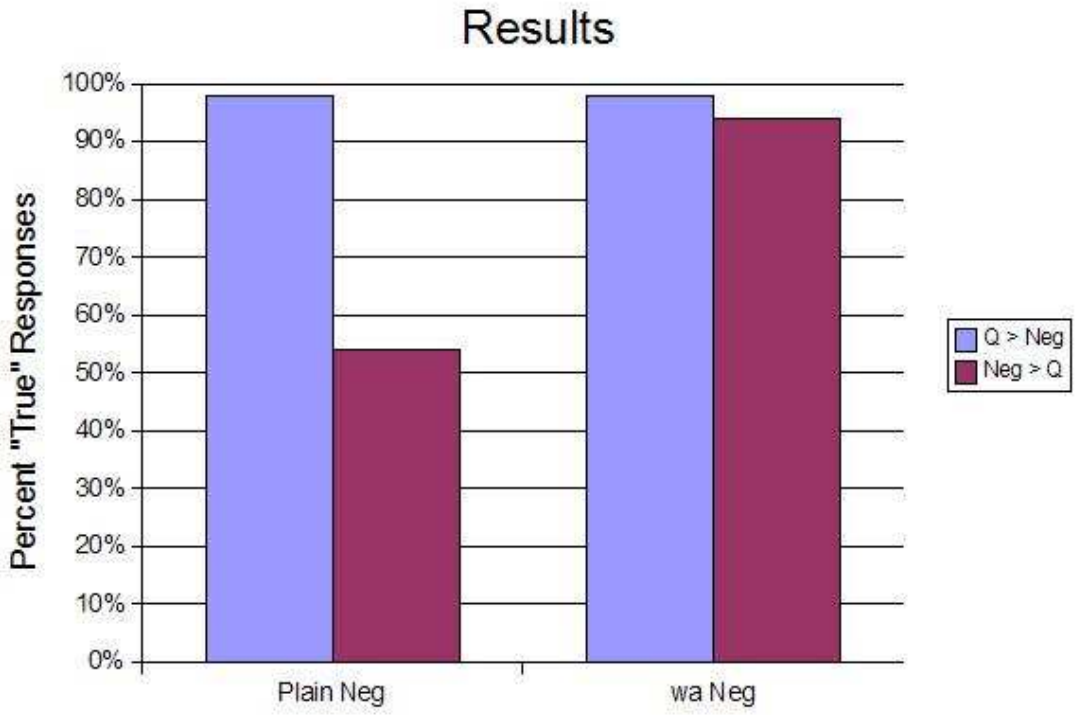


Figure 4.1: Graphical representation of the results.

Plain Negation

For the plain negation-Q>Neg group, the result was 98% true and only 2% false. In a calculation based on 48 responses (four stimuli times twelve participants) this translates as one participant claiming that one sentence of the structure *Donarudo-ga orenji subete-o tabe-na-katta*, 'Donald didn't eat all the oranges,' was false in a scenario where Donald had not eaten any of the oranges.

The results for the inverse scope were quite different. For the plain negation-Neg>Q group, the videos illustrated partial negation scenarios, where the observer would give the same sentence as above, with Donald having eaten two out of the three oranges. Here, the result was 54% true and 46% false, indicating that for just slightly over half of the stimuli, the intended reading was available. Going into the experiment, we expected that participants' answers would be uniform for all their test stimuli: either all true or all false. Assuming that their answers are based on the strict functioning of their grammar and no other external factors, each participant's responses should be consistent. It is in reference to the Group Two results that this is most telling, as nine of the twelve group members scored either 100% or zero. This indicates that what has been uncovered is not some factor of only getting the reading some of the time; rather this indicates that for roughly half the people in the group, this reading was always available, and for the others, it was never available. More will be said on this matter in the summary of the results below, and in the discussion of the debriefing sessions.

wa Negation

The results for Groups Three and Four do not demonstrate this same split. For the *wa*-negation-Q>Neg group, the final result was the same as in the plain negation-Q>Neg group: 98% true and only 2% false. For group four, the results were similar, with a final total of 94% true and 6% false. Again, there will be more to say about this result in the forthcoming discussion.

4.2.3 Overall Results

Clearly, the plain negation-Neg>Q group stands out in the results. However, the present results can be taken one step further. Given four equal condition groups, a statistical test can be applied in order to determine whether this is just some random finding, or indeed is

worthy of further discussion.

In order to verify that Group Two does indeed stand out significantly from the others, a one-way ANOVA was used, comparing the average scores for each participant between all four groups. The end result is [$F(3,44) = 9.156$, $p < .0001$], indicating an extremely high degree of statistical significance. Further post-hoc analysis using the Tukey HSD test yields a significant ($p < .05$) difference whenever Group 2 is compared against one of the other three groups. For all other possible pairwise comparisons among groups, what observed differences do exist are not statistically significant. Taking these results as a whole, we conclude that our findings are indeed indicative of a phenomenon in the larger population.

It is also worth noting at this point that while there was no strong control over this factor, there does not seem to be any correlation between home prefecture and performance in this study. This implies that the results found here are indicative of a phenomenon observable in the population as a whole, and not a localised dialectal variation. The age-range of the participants is too narrow to make a sweeping generalisation, but it can be said that age had no effect within our study. While the average age of the portion of Group Two who responded "false" is slightly less than the average age of the "true" responders, it is not the case that each subgroup is made up of all the youngest or oldest participants in the group as a whole.

4.2.4 Debriefing Notes

In addition to the numerical data gathered from the test itself, the debriefing sessions provided some important insight into the intuitions of the participants when answering, and also generated interesting comments which allowed for an evaluation of the TVJT task itself. These factors will be dealt with separately, with only those factors which influence the data being mentioned here; the methodological implications will be reserved for later discussion.

Changing Answers

It emerged in the debriefing that some participants wanted to change their answers after seeing the scenario a second time. Recalling the discussion of the methodology from Chapter Three, participants were given the opportunity to justify any response of "false" for both filler and test trials, with the option of viewing the scenario again. While the changes to

the test stimulus responses are not included in the calculations above, their inclusion would lead to an even more defined split. The results for Conditions One and Three, the Q>Neg conditions, would both become 100% true, meaning that for all participants in all cases, total negation was available. Groups Two and Four would also change, with Group Four moving from 94% true to 98%, and Group Two, the stand-out group, shifting to 52% true and 48% false, which is only one response away from a perfect 50/50 split.

While these changes are not reflected in the statistical calculations above, they indicate that the findings are indeed on the right track: both scopes seem to be universally available under *wa*-negation, while Neg>Q is only available to fifty percent of people under plain negation. Also, one of the changes would have brought the number of totally consistent participants in Condition Two up to ten, meaning that out of the twelve people in that group, only two gave variable answers; all the others said either all true or all false.

Justifying Group Two

The reasons that participants gave for answering "false" in Condition Two are of particular interest, as they provide anecdotal evidence that partial negation is not available for them. Returning again to Donald and his oranges, this was the scenario where Donald ate two of the three pieces of orange, and the sentence was given with plain negation.

When prompted to say why the stimulus was false in this circumstance, participants universally made a claim to the effect that "he ate two of them." This indicates that in this situation, the participants clearly only have a reading of total negation; the fact that Donald ate two of the oranges makes the whole statement false for them.

The debriefing question as to whether any of the sentences could be true or false at the same time also has some bearing on this discussion. In all, nine participants claimed this was the case, although three of these cited reasons other than negation and quantifier scope. Of the six who identified Q>Neg vs. Neg>Q as being a source of ambiguity in Mickey's sentences, half were from the sub-group which responded all *true* to Condition Two stimuli. Given that only six out of forty-eight participants were able to identify the scope issue, the fact that three of those six were in a small sub-group of the total participant population is worth noting. This seems to indicate that whatever it is that differentiates the two subgroups in Group Two does not just make Neg>Q available for half the population, it makes *both* readings available.

Non-Native Speaker Effects

One final note worth mentioning here is the result of the one question in the debriefing designed to test whether having the stimuli produced by a non-native speaker affected the data. When asked if they noticed anything about the observer's statements, one quarter of the participants did comment on the non-native accent evident in the stimuli, but this was usually qualified with a follow-up statement claiming that the accent did not colour their responses. A number of participants did comment upon the observer's usage in general, particularly the use of *wa*-negation, which was described as non-standard or "not everyday use." Presumably, these claims would have been made whether the speaker was native or not.

Whether this is the case or not, given the fact that the accent did not stand out as an issue to most participants, added to the fact that most of those who noted it were not influenced by it, it seems reasonable enough to conclude that the use of a non-native speaker had no impact upon the experimental results themselves.[4] However, there are methodological implications stemming from the responses given on this subject, which will be discussed in the next chapter. In the meantime, armed with results that have been shown to be statistically significant, we return to the syntactic question which motivated this study: where should negation be placed in Japanese phrase structure?

[4]Of course, to say this with absolute certainty, a control group would be needed where the stimuli were delivered by a native speaker.

Chapter 5

Discussion of Experimental Results

The findings of the TVJT experiment on Japanese negation scope have implications for a number of different fields. First and foremost, there is the question which spurred the research in the first place: where does negation appear in the phrase structure? A satisfactory answer can be justified, but in order to account for the odd results in Condition Two, attention must be brought to bear on another issue: overt verb raising. Further, a comparison of these results with the results from Han et al. (2003) suggests some interesting new possibilities for the study of head-final languages and syntactic acquisition. Finally, the process has provided valuable insight into the process of conducting such psycholinguistic experimentation. While the performance of the participants on the test data has been discussed above, their performance on the filler trials is worthy of separate discussion in and of itself.

5.1 The Structure of Negation

As indicated in Chapter Two, independent syntactic evidence can not only be shown to be consistent with an analysis indicating that NegP is lower in the structure under v^0, but coordination evidence actually pushes one toward this conclusion. Thus, we expected going into the TVJT task that the scope availability should reflect this lower position. That is, the object quantifier should always be able to take scope over negation, despite the fact that the literature on scope indicates that this is a subtle secondary reading. The opposite reading, where negation takes scope over the object position, would depend on whether the V-Neg-T complex is formed through some sort of syntactic raising operation, or through

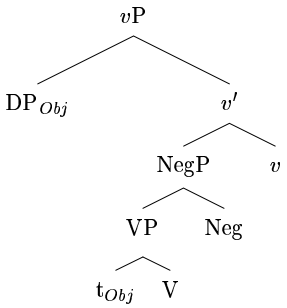
a morphological process which does not affect the syntactic structure. Under raising, the Neg>Q scope should be available, but under the morphological process it should not. In this section, the possible structural analyses of negation will be measured against the results from the TVJT test.

5.1.1 Groups One and Two: Plain Negation

The results for the first group could not have been much closer to the initial prediction. Indeed, if changed answers are factored in, then the results are entirely in accord with what the syntax would predict under a lower placement of negation. The first result is that in 98% of cases, the reading of Q>Neg is available.

Recalling the trees discussed in Chapter Two, relevant part of the lower placement of negation option (28) is again repeated below:

(63)



As shown, the final resting place of the object quantifier, unquestionably bundled with the object as discussed in Chapter Three, C-Commands the Neg^0 head. This predicts that an object quantifier should always be able to take scope over negation, a prediction which is borne out by the results of the TVJT experiment.

This is also an interesting finding for the scope literature. Setting aside *wa* marking of nominals, the scope of negation has been considered by some to be isolated to the verb only. The result here is consistent with that analysis, as the quantifier is clearly taking scope over the negation, indicating that negation has the narrowest possible scope. However, recalling Kuno (1980), who initially makes this narrowest-possible scope prediction, the situation is changed when a quantifier is introduced into the object position. Under these circumstances the "normal" situation is said to reverse, and a Q>Neg reading, illustrated using the pie eating examples, (46), is given to be subtle or secondary to a primary Neg>Q reading. This feeling of total negation being somehow more difficult to read is echoed throughout most of

the relevant literature in the 1980's, and yet the results here indicate that the reading, given the right context, using the quantifier *subete*, is unproblematically available to virtually all speakers of the language.

This leads into the most contentious facet of the Group One evidence. While the result of 98% true is suggestive of an analysis where the quantifier is taking scope over negation, it can not be taken as definitive proof in this case. This is due to the choice of quantifier used; 'all' has unique entailment properties when combined with negation, discussed in Lidz and Musolino (2002), which must be reckoned with when drawing a division between what the data is consistent with, and what the data actually proves.

If one were to assume that Neg^0 was indeed base-generated above vP, where the object quantifier could never C-Command it, a result of 98% true for a Q>Neg reading using 'all' could still result. Under this assumed structure, the syntax would allow only one reading, Neg>Q, which in the case of 'all' translates as 'not all.' In terms of Donald and his oranges, the truth conditions of a 'not all' reading would minimally require that there be one uneaten orange. This condition is met in the extreme in the Condition One scenarios, where all the oranges remain uneaten. That is, in a situation where Donald has not eaten any of the three oranges, the sentence *Donarudo-ga orenji-subete-o tabe-na-katta*, 'Donald did not eat all the oranges,' is true under a Neg>Q reading, as the truth conditions for 'not all' have been met. Thus, given the fact that the quantifier *subete* was used, the strongest claim that can be made solely on the basis of Condition One results is that neither structure is disproved.

Nevertheless, the necessary data for determining the position of negation does emerge when the Condition Two results are added to the picture. First, the situation for the 54% true responses should be considered. Here, the only conclusion is that negation is C-Commanding the object position. What is open for some debate at this point is whether this is a fact of base generation at a higher position, or possibly the result of some sort of overt raising which places negation at a higher place in the structure before LF.

The clinching data comes from the 46% false responses. As was indicated in the debriefing questions, for these participants, the sentences were not ambiguous, and a Neg>Q reading was in no way available. The syntactic translation of this is that at no time before Spell-Out can negation C-Command the final resting place of the object quantifier, yielding only a Q>Neg reading. In this case, with *subete* and keeping in terms of Donald and oranges, the truth conditions of Q>Neg would require that there be no uneaten oranges. In the Condition Two scenarios, there was one uneaten orange, which does not satisfy the

truth conditions of a Q>Neg reading. This result is compatible only with the structural analysis where Neg^0 is base-generated below [Spec, vP]. However, the fact that there is an almost perfect 50-50 split between the two camps in this group makes a final determination tentative at best.

The choice becomes one of finding a structure which captures as much of the data as possible. Under a higher placement of negation, there is no way to account for the responses where participants clearly did not have a Neg>Q reading available; negation would always C-Command the object quantifier. The lower placement argument readily captures the universal availability of Q>Neg readings from Condition One, as well as all those who answered 'false' in Condition Two. Furthermore, by positing an overt verb raising operation, the lower placement can be made consistent with the availability of Neg>Q as well, which is a distinct advantage over the high placement analysis. Under such an analysis, a verb would raise overtly to T^0, moving through Neg^0, taking the negation head along with it as it continues upward. This movement yields a structure where negation C-Commands the object quantifier position, yielding Neg>Q. Thus, at this point the data favours the lower placement analysis, subject to further discussion into the nature of the split results in Group Two.

5.1.2 Groups 3 and 4: *wa* Negation

The final results for these two groups are not solid enough to provide conclusive proof one way or the other, as it was previously demonstrated in Section 2.4.3 that *wa* negation is syntactically compatible with either placement of Neg^0. However, the results do provide some insight into the formation of *wa* negation.

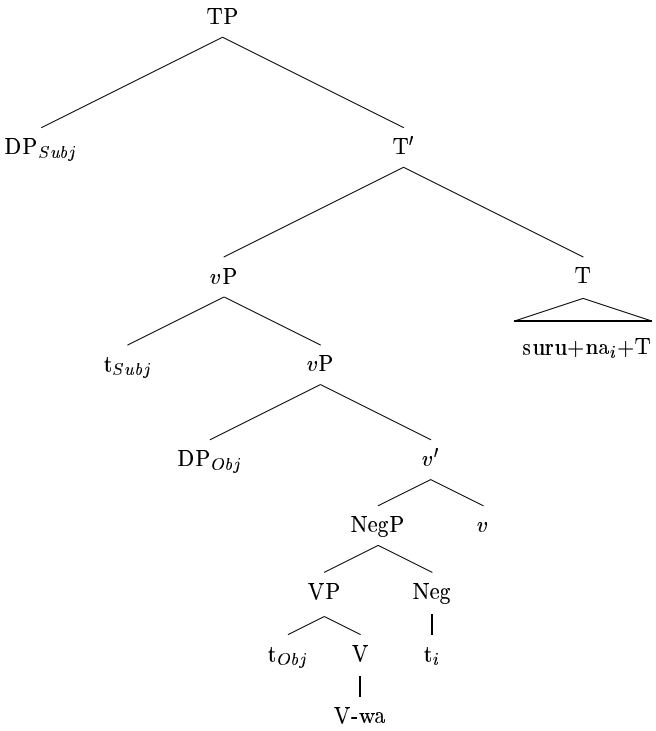
The results for Condition Three were in fact exactly the same as for Condition One. Looking at this from the perspective of McGloin's predictions for *wa* negation, this is rather unexpected, as she predicts that negation takes scope over the entire sentence in this construction. Moreover, this result makes the claims in the literature that Q>Neg is harder to read even more problematic: it seems to be freely available in both plain and *wa* negation. However, it could again be the case that this is just a Neg>Q reading obtaining in a 'none' scenario due to the previously discussed entailment property of *subete*.

Structurally, Group Three's results have similar implications to those from Group One. They are compatible with an account where negation starts out below the object quantifier, but are not certain proof of that fact. If negation starts out low, and remains *in situ*,

then the results are perfectly fine. However, if negation starts with a higher placement, or undergoes raising, the judgements can be explained by calling upon the entailment once again: a 'not all' is being obtained in a 'none' situation.

Recalling McGloin's scope judgements for *wa* negation sentences, the results from Group Four are not at all surprising, restoring her claim that negation takes the widest possible scope in such structures. The structural reflection of a universally available Neg>Q reading under *wa* negation at first seems to contradict the tentative conclusion made based on the plain negation findings. The clearest implication is that negation will always C-Command the object quantifier. However, recall that under our analysis of *wa* negation, the negation head obligatorily moves upward to T^0, where it does C-Command the object quantifier. This raising analysis, starting from a lower placement of negation, is illustrated again in the tree below:

(64)



As shown, the negation element winds up at T^0, where it takes scope over the quantifier, clearly making Neg>Q readings possible; available Q>Neg readings are a by-product of the entailment facts discussed in relation to the Group One findings. However, as was mentioned previously, the same end result would be obtained under the higher placement

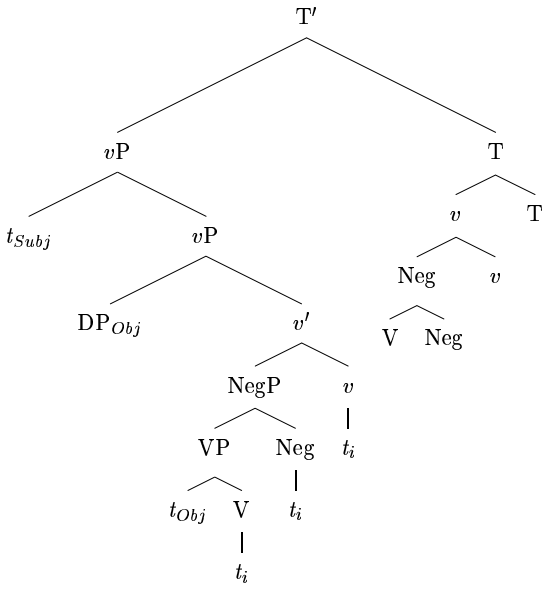
of negation. While the results from the *wa* negation groups are not informative in regards to the placement of negation in the phrase structure, they do support the account of *wa* negation we have developed.

The final conclusion is that the only really conclusive data from this TVJT experiment is to be found in Group Two. The data from the other groups make a positive contribution in that they can be interpreted as compatible with either structure, but the negative data from Group Two, where there is solid evidence *against* the higher placement of Neg^0, is the most valuable piece of data gained with reference to the question of where negation should be placed in Japanese phrase structure. Given that this data is consistent with the syntactic evidence discussed earlier, it can be safely concluded that, despite the oddity of placing a functional head within a lexical domain, the low-placement alternative is the most sound. Japanese NegP dominates VP, and is complement to v^0. However, the split result in Condition Two will require further explanation.

5.2 Evidence for the Existence of Overt Verb Raising?

In the discussion of the plain negation results, it was claimed that the lower placement of negation analysis should be adopted, subject to further discussion. This discussion is on the subject of why only half of the responses seem to support this analysis, and the other half are merely consistent. In fact, this result is not entirely surprising: a similar result was obtained in the Han et al. (2003) study for Korean. Q>Neg readings were universally available, whereas Neg>Q was available for just less than half the population. The explanation proposed there is that this is a reflection of the fact that only half the population has acquired a grammar which employs overt verb raising. Casting this in terms of our Group Two results, the subgroup which answered all 'false,' demonstrating Q>Neg readings, would not have the overt verb raising operation. For them, negation does not overtly move up to a position where it C-Commands the object position. For the all 'true' subgroup, they would have this raising operation, which would carry negation to T^0 along with the verb:

(65)



The end result of this raising is illustrated in (65), where, according to the definition of C-Command we have adopted here, negation C-Commands out of the complex head at T^0 and takes scope over the object position.

In this section the discussion will become increasingly hypothetical as this possible explanation is explored, and the results of this TVJT test are re-cast through this new interpretive lens. Furthermore, the discussion could provide an insight into the reason the literature on negation scope in Japanese is so inconsistent.

5.2.1 The State of the Literature on Raising

Before launching into a discussion of how the TVJT results have an impact on the separate question of verb raising, the relevant issues must be explored. This begins with a brief summary of the uniqueness of the problem for languages such as Japanese and Korean, followed by a review of some major contributions in the literature on Japanese verb raising in particular.

Why the Puzzled Look?

In the standard Minimalist program, verb raising is taken to be a given. The question is whether or not this raising is overt, applying before Spell-Out and thus affecting the phonological form of the sentence, or after Spell-Out, where it is a covert raising at LF

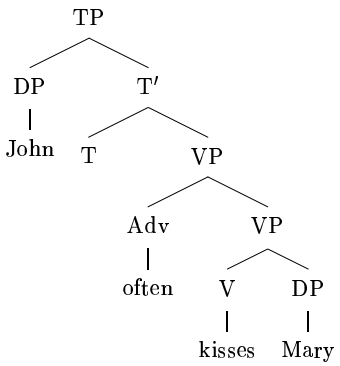
with no impact upon the words as spoken. The examples cited in Emonds (1978) and Pollock (1989) are classics, and still applicable even if they pre-date the current theoretical approach:

(66) a. John often kisses Mary.

b. Jean embrasse souvent Marie
Jean kiss often Mary
'John often kisses Mary.'

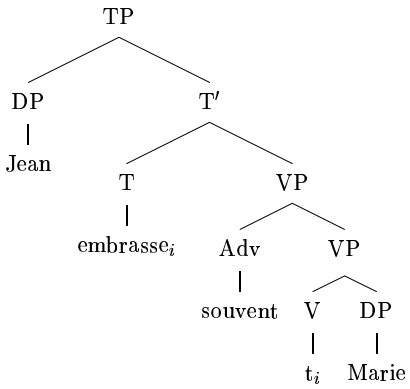
Example (66a), from English, is a simple example of a transitive sentence containing a VP adverb which intervenes between the subject and the verb. A simplified illustration of the English structure demonstrates:

(67)



In the second example, from French, the same underlying syntactic structure generates a different word order. Here, the verb appears above the VP adverb, adjacent to the subject at [Spec, TP]. Again, the use of a simple tree can illustrate:

(68)

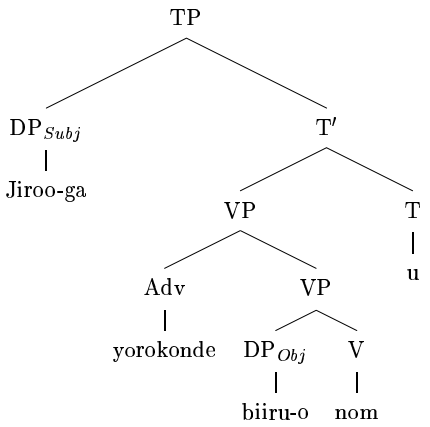


The accepted explanation of this contrast is that in French, a verb raising operation is applied before Spell-Out, forcing a change in word order. The verb raises up from V^0 to

T^0, forced by some uninterpretable feature. In the English case, this feature is said to be absent, allowing the verb to remain *in situ* at Spell-Out, although it remains subject to any necessary LF movements one may posit. Hereinafter, the general term "verb raising" will be understood to stand for the overt, pre-Spell-Out operation evident in French, and not any further abstract moves, as are claimed to exist in English.

As mentioned earlier in the discussion of Fukui and Sakai's visibility condition for functional categories, the situation with raising in Japanese is quite different. Even where a known VP adverb is used, appearing at the left edge of VP, the position of the verb will not be evident, as Japanese is a head final language. Raising a verb from V^0 to T^0 will have no impact upon word order, again illustrating using a simplified structure:

(69)



Here, the verb is shown in its base-generated position, but this tree suffices to illustrate the fact that if the verb were to raise, whatever phonetic content it held would remain at the end of the sentence, occupying the same string position despite being at a higher syntactic node. This type of "invisible" raising is given the designation *string vacuous*.

Thus, for a head final language such as Japanese or Korean, there is no easy way to detect any verb raising that occurs before Spell-Out. Researchers have been forced to try finding other indirect evidence for this phenomenon.

Otani and Whitman

Otani and Whitman (1991) is often cited in the literature as the starting point of the indirect arguments for overt verb raising in Japanese. Their argumentation is actually a merger of syntax and semantics, hinging upon the availability of so-called "sloppy" readings

in sentences such as the following:[1]

(70) a. John$_i$-wa jibun$_i$-no-roba-o tataki-ta.
John-TOP self-GEN-donkey-ACC beat-PST
'John$_i$ beat self$_i$'s donkey.'

b. Bill-mo ker-ta.
Bill-also kick-PST
'Bill$_j$ also kicked self$_j$'s donkey.' (Sloppy)
'Bill$_j$ also kicked self$_i$'s donkey.' (Strict)

In this example, it is important to note that both the strict and sloppy readings are available for the second sentence. According to Otani and Whitman, such sloppy readings are obtained through an LF operation which takes VP's in consecutive sentences as input, essentially copying the material from the first into the second, provided the second contains no overt lexical material. This means that the VP in the second sentence is phonetically empty, containing a trace of the raised verb and a null object. They conclude that this data illustrates that verb raising in Japanese must occur *by* LF. This argument has been challenged in the literature, notably in Hoji (1998), where it is argued that the readings obtained by Otani and Whitman are not true sloppy readings, and thus do not comprise any evidence for this LF operation which takes empty VP's as input. The implication is then that this is not evidence to support the existence of overt verb raising.

Koizumi

A major contributor to the argument for overt verb raising in Japanese is Masatoshi Koizumi. His syntactic arguments for raising occupy a significant portion of his 1995 thesis, and are later refined in Koizumi (2000). His arguments are similar to Otani and Whitman in that they search for evidence of VP's out of which the head verbs have raised, called remnant VP's, undergoing some secondary syntactic operation.

The first type of evidence offered by Koizumi is coordination. He presents examples where strings of arguments are conjoined as though they are syntactic constituents:

[1] These examples are simplified from the originals, but all lexical material and readings are intact.

(71) Mary-ga [John-ni ringo-o futa-tsu t_i] to [Bob-ni banana-o sam-bon t_i]
Mary-NOM [John-to apple-ACC two-CL t_i] and [Bob-to banana-ACC three-CL t_i]
age_i-ta.
$give_i$-PST
'Mary gave two apples to John and three bananas to Bill.'

Here, the strings *John-ni ringo-o futa-tsu* t_i and *Bob-ni banana-o sam-bon* t_i are said to be remnant VP's from which their verbs have raised in an across-the-board fashion to a single shared higher node. For Koizumi, the constituents here could be either VP's conjoined as complement to v^0, or vP's, conjoined as complement to T^0.

However, Koizumi takes the analysis one step further, adding the subject into the conjuncts:

(72) [Mary-ga ringo-o futa-tsu t_i] to [Nancy-ga banana-o sam-bon t_i]
[Mary-NOM apple-ACC two-CL t_i] and [Nancy-NOM banana-ACC three-CL t_i]
$tabe_i$-ta.
eat_i-PST
'Mary ate two apples and Nancy three bananas.'

The implication he draws from this and similar sentences is that verbs in Japanese raise overtly to C^0, and that the conjuncts in (72) are actually remnant TP's. However, Koizumi himself notes that this is merely consistent with a raising analysis, and not definitive proof of one.

The second type of evidence comes from clefting structures, illustrating that remnant VP's can be clefted, with their verbs stranded:

(73) Mary-ga t_i age_v-ta-no-wa [John-ni ringo-o mit-tsu t_v]$_i$ da.
Mary-NOM t_i $give_v$-PST-GEN-TOP [John-to apple-ACC three-CL t_v]$_i$ be
'It is three apples to John that Mary gave.'

Koizumi's discussion of this type of example is somewhat narrow, paying attention only to the alleged constituent status of the remnant VP's. There is no discussion of the function of the nominalising genitive particle, nor the *wa* marking. His account of the structure of examples like (73) is limited to illustrating the remnant VP moving out from its base position, over the *no-wa*, to its final position adjacent to the copula. As with the coordination examples, Koizumi goes on to provide further evidence that subjects can also enter into this clefting operation, further pushing the argument that verbs raise to C^0.

The third and final type of evidence given in Koizumi's argument is his discussion of scrambling and subjacency. He begins by making a basic claim, based on traditional definitions of subjacency, that as more and more elements are subject to long-distance scrambling, the acceptability of a sentence decreases significantly. He gives the following as an example of three scramblings, marking it with '???' indicating extreme dubiousness:

(74) Purezento-o$_k$ Masami-ni$_j$ Hawai-de$_i$ John-ga Kiyomi-ga t_i t_j t_k kat-ta to
present-ACC$_k$ Masami-to$_j$ Hawaii-at$_i$ John-NOM Kiyomi-NOM t_i t_j t_k buy-PST that
omotte-iru.
believe-NPST
'John believes that Kiyomi bought a present for Masami in Hawaii.'

However, he then goes on to say that essentially the same structure is improved if the scrambled elements are all treated as being part of a single constituent, a remnant VP:

(75) [Hawai-de Masami-ni Purezento-o t_v]$_i$ John-ga Kiyomi-ga t_i kat$_v$-ta to
[Hawaii-at Masami-to present-ACC t_v]$_i$ John-NOM Kiyomi-NOM t_i buy$_v$-PST that
omotte-iru.
believe-NPST
'John believes that Kiyomi bought a present for Masami in Hawaii.'

For (75), it should be noted that the pre-posed elements now appear in their canonical ordering. He then claims that if the whole set of pre-posed elements is uttered as a single intonation unit, then the acceptability of the sentence can be credited to the fact that it is in fact a remnant VP undergoing a single long-distance scrambling. As in the other cases, further examples are given supporting the analysis that verbs in Japanese make it all the way up to C^0, which is Koizumi's final conclusion.

Fukui and Sakai

Fukui and Sakai (2003) delivers a very credible counterargument on behalf of the "no overt raising" camp. The authors briefly discuss Otani and Whitman, then spend a good deal of time refuting all the arguments presented by Koizumi.

The weakness in Koizumi's analysis exploited by Fukui and Sakai is the constituency of the argument strings which Koizumi describes as remnant VP's. Fukui and Sakai claim that this analysis is short-sighted, in that it ignores the fact that such constituents, not found in languages such as English, do appear in Japanese, even where there is no evident candidate

to identify as a verb which has been raised. In essence, Koizumi's remnant VP's could be constituents without necessitating the presence of a verb trace. The following sentence is given as a possible response to a question asking for a concrete listed account of what gifts were exchanged at a class party:

(76) Taroo-ga [Hanako-ni mannenhitsu-o ni-hon] to [Tomoko-ni tokei-o
Taroo-NOM [Hanako-to fountain pen-ACC two-CL] and [Tomoko-to watch-ACC
futa-tsu], sorekara, [Jiroo-ga Hanako-ni hon-o is-satsu] to [Tomoko-ni
two-CL] and Jiroo-NOM [Hanako-to book-ACC one-CL] and [Tomoko-to
shashinshuu-o ni-satsu], ato, [Hanako-mo Taroo-ni shashinshuu-o is-satsu]
photo album-ACC two-CL] and Hanako-also [Taroo-to photo album-ACC one-CL]
to [Jiroo-ni hon-o is-satsu] da-yo.
and [Jiroo-to book-ACC one-CL] be-PRT
'It was that Taroo, two fountain pens to Hanako and two watches to Tomoko and Jiroo, one book to Hanako and two photo albums to Tomoko and also Hanako, one photo album to Taroo and one book to Jiroo.'

The remarkable thing in this rather bulky sentence is that none of the [IO-DO] conjuncts can contain a trace of an across-the-board raised verb, as there is no such verb evident in the sentence, nor would it have come from the previous discourse.[2] A series of convincing arguments against the coordination evidence presented by Koizumi are given, but as Koizumi himself admits that the coordination data does not constitute solid proof, those arguments are not here discussed.

An alternative analysis of the clefting argument is also available whereby the portion assumed by Koizumi to be a single constituent is actually a complex element. Fukui and Sakai's analysis attacks the question of what moves from the completely opposite direction:

(77) [Mary-ga t_j t_k age-ta-no]$_i$-wa John-ni$_j$ ringo-o$_k$ san-zatsu t_i da.
[Mary-NOM t_j t_k give-PST-NL]$_i$-TOP John-to$_j$ apple-ACC$_k$ three-CL t_i is
'It is three apples to John that Mary gave.'

Here, the objects move out of the nominalised clause independently, and the remnant clause is pre-posed through a topicalisation operation. This analysis is at least as credible as Koizumi's, and the authors note it has the additional benefit of explaining the presence of the copula *da*, which they claim usually appears after nominalised predicates. Here, the

[2]Fukui and Sakai provide a framing question before this sentence which has been omitted here for brevity. Nowhere in that frame does the verb *give* appear.

nominalised predicate is preposed from a position adjacent to the copula. Fukui and Sakai further note that the presence of the copula is not usually explained in other accounts of this construction.

They also challenge the scrambling argument, declaring it to be conspicuously theory-internal, and based on some potentially faulty assumptions. In the end, they conclude that not only is Koizumi's data not sound, but that in fact no evidence can be found to support a claim that Japanese has any overt verb raising. Any discussion of negation is conspicuously absent from their discussion, although this is explained away by their opening declaration, noted in Chapter Two, that negation scope data is too inconsistent to be applicable.

Thus, much as with negation scope, there is a distinct dichotomy in the extant literature. Some researchers claim that raising must occur, while others claim that there is no chance that raising can occur. While the conflict here seems to be a more theory-internal one, if the researchers involved are writing based on their own intuitions that the language does or does not have overt verb raising, then there could be an observable parallel between negation and verb raising.

5.2.2 Two Grammars?

What then does all this have to do with the results from Group Two in the TVJT experiment seeking systematic data on negation scope? To answer this, one must first recall that there are two possible ways in which the final V-Neg-T complex can be formed in Japanese. It could be a morphological phenomenon, occurring post-Spell-Out, or it could be a reflection of overt head movement taking place in the syntax before Spell-Out.

Assuming the raising analysis, a verb in a plain negation sentence would move upward, first to the Neg^0 head, which has been determined to be the next syntactic head in the phrase structure, and the V-Neg complex then moves up through v^0 coming to rest at T^0.[3] Under the terms of scope rigidity, this would predict that Neg>Q should be available at the exclusion of Q>Neg.

Recalling the results from Group Two, only about half the participants claimed that a partial negation reading was available in plain negation. Then, by the statistical tests, these results are safely generalised out to the entire population, establishing that for half

[3]Actually, there is no data yet which forces us to conclude that the verb does not indeed move all the way up to C^0. However, raising to T^0 is the minimum required movement, so that is all we posit here.

the population, partial negation is a possible reading, while it is impossible for the other half. This is indeed a troublesome finding, suggesting the type of inconsistency which leads Fukui and Sakai to simply say that the data is too unreliable to be useful. However, the conclusion reached in Han et al. (2003) can certainly be extended to this case.

Perhaps the initial assumption that the population selected in the TVJT experiment was homogeneous is the problem. While these were all native speakers of Japanese, the data could be argued to indicate that they were in fact speakers of two different varieties of Japanese: one with overt verb raising, and one without. At first glance, this seems to be a rather outlandish claim, but when one recalls that overt verb raising would be string vacuous, it does not seem that improbable that there might be a split grammar. The raising and non-raising varieties of Japanese would be phonetically indistinguishable, with the differences arising in the syntax finding their expression in the semantics.

In essence, the data from the TVJT experiment provides evidence not only for a principled argument regarding the position of negation in Japanese phrase structure, but it also has a much larger implication for Japanese as a whole. As with Korean, the evidence seems to point to a conclusion that there are two grammars of Japanese, differing in this one parameter, co-existing within a single population that is apparently unaware of this split. However, before such a claim can really be advanced, it must be shown to be at least consistent with the rest of the results from the TVJT experiment. Split grammars are fine for cases where there is a fifty-fifty split in the results, but for all the other control groups, there was near-universal agreement.

5.2.3 Re-interpreting the Results

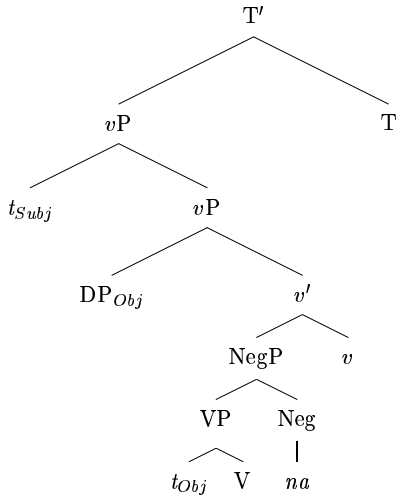
For Condition One, where the Q>Neg scope was tested in stimuli with plain negation there was a reported 98% availability of the target reading. However, recall from the discussion of those results that they were not particularly useful for the discussion of the structure of negation, as they could have been shown to be compatible with a scenario in which negation was either above or below the direct object in the structure being fed off to LF for scope interpretation. This was a hindrance to the original investigation into the structure, but it is an incredible asset to the discussion of the split grammar.

It would seem reasonable at first glance to assume that if there was indeed a split in the grammar that it should be reflected in the Condition One results as well as Condition Two. That is, those with a raising grammar (who responded true in Condition Two) should have

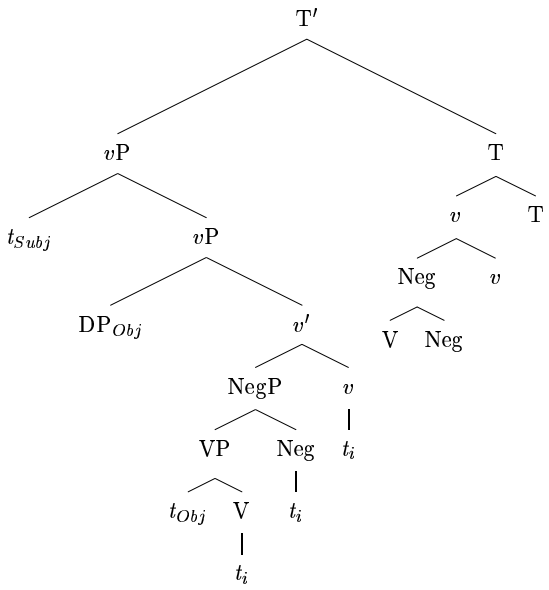
responded false in Condition One: another 50-50 split. Assuming that half of the participants in Group One also had a raising grammar, this was not evident in their responses. The answer to this puzzle lies in the entailment problem discussed earlier: exactly what made these results inconclusive in the previous discussion on structure.

Thus, for plain negation, the following two final structures are proposed:

(78) a.



b.

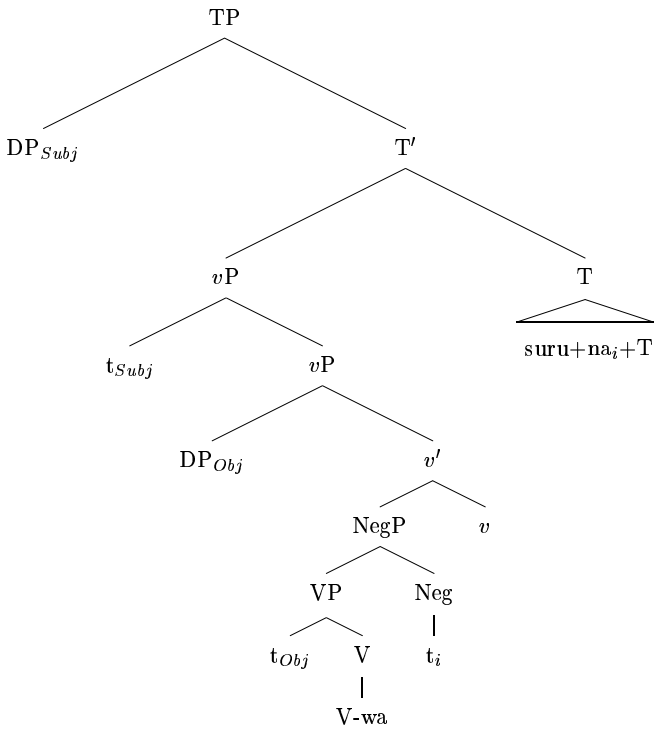


For the half of the population with the non-raising grammar, the situation is simple. As illustrated in (78a), negation stays *in situ* at surface structure, and the quantifier quite rightly takes scope over it. With the raising grammar, shown in (78b), it must be assumed

that the entailment problem is responsible for the apparent Q>Neg readings. With negation being interpreted at the higher position, a reading of 'not all' is still obtained, and 'none' is a compatible extreme case of 'not all.' They would then still answer 'true' in a Q>Neg situation, despite the fact their syntax yields a Neg>Q reading. Thus, the results for Condition One are again consistent if not conclusive.

In terms of the *wa* negation results, the account remains virtually unchanged from the discussion above. In order to account for the uniformity of the data among the *wa* negation groups, an analysis is required in which the Neg^0 head moves independently of the verb up to T^0, regardless of whether the grammar demonstrates overt raising of the verb:

(79)



The fact that the negation head is still assumed to move upward for that segment of the population showing a raising grammar can be taken as evidence for the claim that the *wa* particle inhibits overt raising, in line with the parallel analysis Fukui and Sakai use for the *mo* particle. Despite having a grammar which otherwise demonstrates evidence of overt raising, in *wa* negation, the verb remains low, frozen in position by the particle, forcing negation to raise up to the T^0 node where *suru* is inserted. Holding on to the analysis as illustrated in (79), the Condition Four results fall directly out from the syntactic structure,

and Condition Three results are a reflex of *subete*'s entailment properties. With this, it can safely be concluded that all the evidence from the TVJT experiment on Japanese is consistent with an analysis modeled upon the conclusion reached in Han et al. (2003).

5.2.4 Shedding New Light on an Old Debate

A natural objection at this point would be to claim that surely there is some other evidence somewhere in the literature pointing to this idea. However, the state of the literature itself seems to be evidence enough: Using researchers seem to be divided into two camps: those who believe overt verb raising does exist in Japanese, and those who do not. The explanation can be just as simple as speculating that perhaps Koizumi acquired a different variety of Japanese than Fukui and Sakai. This would explain the back and forth in the literature: linguists are attempting to reach a unified account of two different grammars, unaware that they are trying to do so because the spoken forms are identical, and differences only turn up in very rare cases.

The great inconsistency in the scope literature could indeed be another symptom of this split grammar. Just as a unified account of verb raising seems unreachable, a unified account of negation scope is unreachable, because the two are inextricably linked. Thus, for those claiming that Q>Neg readings are impossible, or subtle (note in reflection that the ubiquitous pie-eating example used *zenbu*, another quantifier meaning 'all') they could have a raising grammar, while those who claim that negation takes scope only over the verb have the non-raising grammar. In retrospect, this would make Fukui and Sakai's denouncement of negation scope as a viable source of data for syntactic argumentation half right: an analysis based on a singular account of negation scope in Japanese is indeed futile, but this is because the language itself is not a singular entity.

5.3 Head Final Language Syntax and Beyond

As mentioned above, the results of this study mirror closely the results of Han et al. (2003), and the analysis developed there for Korean transfers easily into Japanese. This leads to a number of possible generalisations and future research questions not only in the field of head-final language syntax, but also in the area of acquisition in general.

5.3.1 Japanese and Korean

Taking the Han et al. (2003) finding in concert with the fact that there seems to be evidence of the same phenomenon in Japanese leads to an intriguing typological generalisation. Both languages are head final, and share numerous syntactic similarities. Indeed, each is something of an isolate in linguistic genealogy each being the other's closest cousin amidst a field of seemingly unrelated neighbours. The fact that both languages share this split-grammar could be a reflex of their common head-final nature, or some other property shared by the two languages. The limited evidence available points to the latter of these two claims, as Lidz and Musolino's reported results of a similar (actually more rigorous) TVJT test in Kannada, a Dravidian language which is also head-final, do not show the same split. Thus, head-finality in and of itself does not seem to be a trigger of this possible split grammar. Since the parameter on which the split is predicated is that of overt verb raising, the common element to both Japanese and Korean that stands out is that in both languages, overt verb raising would be string-vacuous. Conversely, as discussed in Han et al. (2003), in Kannada there is primary evidence from tense inflection and agreement which indicates that the language does have overt verb raising. This evidence is absent in the presence of negation, indicating that negation actually blocks this operation.

5.3.2 Acquisition and Poverty of Stimulus

This last statement, that the string vacuity of the proposed verb raising may be the trigger of the split grammar, opens the door to some possible statements that can be made on the subject of linguistic acquisition and the poverty of stimulus argument.

In brief, the poverty of stimulus argument claims that some linguistic faculties must be innate, as no child learning a language is ever exposed to all possible permutations of the language, and yet becomes a full-fledged native speaker. Han et al. (2003) raises issues with this claim, and the findings here further support their position. Jointly, they indicate that the poverty of stimulus does indeed have an impact on the final adult grammar. Some members of the population acquire a certain parametric variation that others do not; the only logical explanation for this would be the relative paucity of relevant data.

First and foremost, there is the fact that the raising is string-vacuous. With no overt signals, the single most obvious source of evidence for overt verb raising is missing. One wouldn't imagine that a child learning French would not acquire overt verb raising; the

effect of overt verb raising is evident in any sentence containing an adverb such as *souvent*.

The other likely source of evidence for overt verb raising would be exactly what this study has focused upon: negation scope. However, even here, there would not be a great deal of data to go on. It does not seem conceivable that the average child acquiring a first language often encounters situations such as the ones used in the TVJT test where scope readings are so obviously clear. Further, as shown in the case of *subete*, there are entailment issues which may further confuse the data. The relevant data would be scarce at best, and possibly contradictory, with some coming from sources with verb raising, and some coming from sources without. The results of the TVJT test in Japanese reflect what could be the most logical, if somewhat cynical, outcome of this situation: a parametric coin toss. Fifty percent of the population has chosen one option, and fifty percent has chosen the other.

These, however, are matters which have strayed far afield from the original goal of establishing the position of negation in Japanese phrase structure. The syntactic question having been answered, the more fundamental linguistic questions raised herein are deferred for future consideration.

5.4 Methodological Implications

The syntactic questions having been dealt with, the findings of this study also have some bearing on methodological considerations of how to carry out this type of research. As discussed in Chapter Three, the data collection method used for this study represents a marked departure from the original TVJT paradigm as defined by Crain and Thornton (1998). The major factors which might have influenced the quality of the data collected are discussed along with the results in Chapter Four, but there were other issues not directly related to the purpose of the experiment which did emerge in the data collection process. One of these relates to the use of the non-native speaker, partially discussed in Section 4.2.4, and the other two concern the content of the scenarios, in response to some frequent odd responses in the unambiguous filler trials. These last two sections in particular should be of interest to any researchers attempting similar research: as they demonstrate just how careful a researcher must be in preparing scenarios for a TVJT experiment.

5.4.1 The Non-Native Speaker

In this section, we discuss the fact that it seems one of the expected results of using a non-native speaker for the observer role in the scenario videos did indeed come to fruition. One debriefing question which has so far gone unmentioned is the one where the participant is invited to guess what the research is trying to uncover. Of the forty-eight participants, only six were able to correctly identify that the research was somehow related to potential ambiguities resulting from the use of negation and a quantifier in the object position.

There were other participants who noted that two different types of negation were being used in the stimuli sentences and thought this might have something to do with the research, but they did not mention any notions of ambiguity. However, while there is no one answer given by the majority of cases, a large number of different answers to the question of what the experiment was about had something to do with the fact that Mickey was not a native speaker. Variations on this theme ranged from a straightforward experiment on how native speakers perceive non-native speech, to more fanciful possibilities such as testing what would happen if native Japanese speakers received their early language instruction from non-native (English) speakers.

Given that the debriefings also indicate that the non-nativeness of the observer was not a hindrance to the actual task, these responses are evidence that the use of a non-native speaker in this case provided an effective blind, by which the participants were unaware of what was actually being tested. This is quite valuable for a study such as a TVJT test, where first-instinct reactions are being sought. If it was transparently obvious that the interplay between negation and quantifier scope was the object of the research, the participants might have been inclined to think about their responses far more than they ought to.

Another influence the use of a non-native speaker may have had on the experiment was to make the stimuli sentences somewhat less obviously contrived. As discussed in Section 3.2.2, the stimulus sentences are grammatical, but somewhat atypical syntactic structures. Giving these sentences to a non-native voice allows the participants to assume that the sentences are presented in such a form due to the fact that the speaker is not a native. Therefore, they should not necessarily think that the sentence structure is being manipulated for the purposes of the experiment.

5.4.2 Modality

Possible confusion over modality was anticipated in the design; the training scenarios designed to militate against this influence have been described in detail in Chapter Three. However, confusion over modality was still a problem with some participants. Some who claimed that the stimulus sentences were indeed ambiguous cited modality as a reason, and not the scope between negation and quantifiers.

In almost all cases where participants asked in the debriefing to change their answers, modality was a factor. However, given the nature of the responses, it later became clear that there could have been additional controls built into the scenarios to further limit the possibility of participants responding based on this factor.

Problems with the modality of the situation presented were especially pronounced when the verb of the stimulus sentence was one that implied a degree of physical exertion on the part of the agent. Scenarios which involved climbing and lifting were particularly prone to being misinterpreted along the lines of modality. By contrast, the scenarios with simple transitives, such as those involving buying and selling, or the oft-cited orange-eating scenario, were never subject to this kind of misinterpretation. This suggests the first most obvious control: limit the scenarios to verbs which are less likely to receive this modal treatment.

However, some variety in the stimuli is needed, and these physical verbs can not always be avoided. Where these verbs are used, there is one other control which can be exercised far more rigidly than was done in this study. Despite being instructed to evaluate the observer's claim based upon the final end-state of the scenario, it is evident that some participants were using the scenario as a whole as a basis for comparison. Thus, when a scenario calls for a man to lift up two out of three items, the scenario should not even show him *trying* to lift up that third item. By illustrating even a failed attempt, *didn't* can easily become *couldn't* in the eyes of some participants.

5.4.3 Lexical Confusion

The other issue which was the source of some incorrect answers was completely unexpected. A number of the participants answered based upon their belief that the observer's statement contained a lexical error. This phenomenon was most pronounced in the filler and training trials, which once uncovered, explained why some participants were giving incorrect answers to the unambiguous stimuli.

The most problematic lexical issue actually arose in the training. In this scenario, an elephant, a giraffe, and a dinosaur are all trying to climb on top of a tree trunk. The giraffe and the dinosaur succeed without any problem, but the elephant does not. Here, the observer makes the following statement:

(80) Doobutsu-ni-hiki-dake-ga kirikabu-ni nobot-ta.
animal-two-CL-only-NOM tree trunk-onto climb-PST
'Only two animals climbed onto the tree trunk.'

In this scenario, the two animals being referred to would be the giraffe and the dinosaur. To the native speaker who checked all the statements before the experiment even began, this sentence went perfectly fine with this scenario. However, a number of participants reported that this sentence was false on the basis that a dinosaur is not an animal.(!)[4]

This problem could easily be avoided by using a set of three creatures which would undeniably be called animals, but the observed phenomenon is interesting. While this is pure speculation, an insight into an interplay between the Japanese classifier system and truth conditions could be evident here. In later discussion, the possibility was raised that the problem might be that one should not use the *hiki* classifier for a dinosaur. An investigation into this matter would be a separate research project in and of itself; for the matter at hand, the moral is to not group entities that may not necessarily form a natural group.

Lexical issues also emerged in a filler scenario again involving dinosaurs and the tree trunk. Here, three dinosaurs meet with three turtles and all wish to climb the tree trunk. The three turtles succeed easily, but the dinosaurs all manage to get partway up, then fall back to the base. In the action, it is very clear that the dinosaurs make some progress, then fall accompanied by all the Japanese onomatopoeic noises appropriate to such a situation. The stimulus here should be fairly unproblematic:

(81) Kyooryuu-subete-ga kirikabu-kara ochi-ta.
dinosaur-all-NOM tree trunk-from fall-PST
'Every dinosaur fell from the tree trunk.'

The issue here was with the verb and the postposition *kara*. A number of participants felt this statement was false (it was intended to be unambiguously true) due to the fact that the

[4]Because debriefing records for the training sessions were not kept, an exact number can not be given here.

dinosaurs did not fall from the top of the trunk, but rather lost their grip and fell halfway. Those who thought this to be false suggested that the verb should incorporate some essence of slipping and falling, not plain falling.

In all these cases, the problem is essentially the same. While the experimenters will obviously have in mind the possible interpretations which they anticipate for the test stimuli, an equal amount of control must be exercised for all stimuli. Such seemingly insignificant factors as word choice can elicit quite divergent interpretations.

Chapter 6

Conclusion and The Road Ahead

As discussed in the previous chapter, we have answered the initial question which spurred this research: attempting to determine the position of negation in Japanese phrase structure. Along the way, there has been an exploration of related research methods, and the final results of the TVJT experiment have opened up a number of intriguing avenues for further research. In this concluding chapter, we briefly review the findings, followed by an exploration of future research possibilities.

6.1 Final Findings

The end result of this study can be summarised by listing contributions to three different fields of inquiry: syntactic, methodological, and, acquisitional. While only one of these was an initial goal of the study, the research process necessitated an exploration into methodology, and the end results have permitted some broader generalisations to be made.

6.1.1 Syntactic Findings

In the end, this is a syntactic study. We have identified and investigated a single question in regards to Japanese phrase structure: what is the nature of negation in Japanese? The existing literature is far from clear on this issue, and there remains some debate as to whether negation should even be represented as a functional head in the phrase structure of the language. This was the starting point, and once we selected the NegP option, the next logical step was to determine where exactly this NegP ought to be placed.

Syntactic data pointed, albeit weakly, toward favouring an analysis where NegP appears in the phrase structure immediately above VP, as a complement of v^0. The search for more conclusive data led into the minefield of negation scope, where the available literature proved to be largely inconsistent, a state of affairs which had led some researchers to declare it virtually useless for any syntactic analysis. However, instead of backing off from the issue, this study, inspired by Han et al. (2003), sought to systematically collect scope judgements from native speakers through psycholinguistic experimentation.

The results of this psycholinguistic experiment support our claim from Chapter Two that the functional head for Japanese negation should indeed appear in the lower position, despite the oddity of inserting a functional head into what is usually a lexical domain. This conclusion is based upon the finding that for roughly half of the Japanese population, negation can not take scope over an object quantifier, meaning that negation must be base-generated at a position below the final location of the object quantifier.

The discovery that this result is limited to only half the population in itself requires a syntactic explanation, and thus the results of this study into negation also have relevance to the separate question of overt verb raising in the language. The split in the population on the availability of certain negation scope readings turns out to be a reflex of a split on the grounds of verb raising. Half of the population demonstrates overt verb raising, while half does not.

6.1.2 Methodological Advancement

This study utilised a variant on the Truth Value Judgement Task originally developed by Crain and Thornton. Borrowing some ideas from another methodological variant presented in Han et al. (2003), this study developed a new method of performing the experiment, making the process more-adult friendly from the participant's side, and more controlled and less labour-intensive from the experimenter's point of view.

Our TVJT task used digitally recorded video files as stimuli, allowing the entire experiment, from stimulus presentation to data recording and analysis, to be carried out on a single portable computer. While this in itself is a worthwhile contribution to the research side, the problems encountered along the way can serve as important warnings both for future research on this topic, and for other projects which may seek to use similar methods. Over all else, the sensitivity of participants to questions of modality in the scenarios presented is an important observation.

Also worth noting is the impact of using a non-native speaker of the language to present the test stimuli. At first, this may seem to be a questionable decision, but it has been shown to be of some methodological merit. By making this choice, an additional factor was added to the experiment which blinded the participants to the true nature of the study. Introducing the non-native speaker provides a plausible reason for using somewhat contrived sentences without it being obvious that the structural oddity itself is being tested, and it may make participants more sympathetic to the observer, making 'false' responses that much more valuable. This is key, as this study's final conclusion is based upon a set of such responses where the participant definitely disagreed with the observer.

6.1.3 Head Final Languages and Beyond

The final group of findings generated from this study ties back into the TVJT results suggesting that there are in fact two co-existing grammars of Japanese. These results support the claim made in Han et al. (2003) for Korean; there too, a TVJT study with similar results led to the argument for a split grammar on which the argumentation here is based. With this, a broader claim about head-final languages can be made, or at least a claim about the grammars of head-final languages in which overt verb raising is string vacuous. Uniting the Korean data with the Japanese data, it now seems fair to say that the problem of the poverty of stimulus may be more serious than is generally accepted. In the face of insufficient data, supposedly monolingual populations can develop observably different grammars.

This then provides a neat account of observed inconsistencies in the current linguistic literature on Japanese: no consistent account of negation scope or verb raising exists, because these phenomena are not consistent within the population. Thus, the conundrum which blocked the simple answering of the question of negation's place in the phrase structure, the inconsistent scope facts, has also been resolved.

6.2 Future Research

With these findings having extended beyond the original scope of the study, there is room for much more work to be done. Further investigations can be broadly broken down into two categories: theoretical and experimental.

6.2.1 Theoretical Routes

Here, the notion of theoretical research routes is being used to describe research which would take the character of an intense analysis, or re-analysis of existing linguistic data, re-casting it in terms of the results found here. This research could begin with Japanese, but it could extend much further.

A Truly Unified Japanese Grammar

In theoretical terms, one avenue open for exploration is the attempt to formulate a unified grammar of Japanese which takes into account the observed split in the grammar. As was shown in the discussion of the verb raising literature, the conflicting analyses are usually quite distinct from each other, aside from just the parameter of verb raising. In order to find as accurate an accounting of the available facts as possible, it could be worthwhile to attempt to unify these disparate arguments. Such a unification would start from the assumption that for all the observed structures in the language, string-identical accounts need to be developed both with and without verb-raising. Ultimately, the goal would be to arrive at an account in which these parallel analyses remain as faithful to a single account as possible.

Indicators of Split Grammars

An investigation of other syntactic phenomena in Japanese which ought to be dependent upon verb raising might also be fruitful, as an observed conflict in the data there would be further support for the split grammar hypothesis. Looking even further afield, it might be advantageous to determine whether this phenomenon is observable in other natural languages: more examples make a split-grammar hypothesis more credible. One possible line of research here would be to compare the presently-observed phenomenon in Japanese with research showing similar splits in a historical context, along the lines of Kroch (1989), where variation in usually stable grammatical parameters is viewed as a competition between grammars, resulting in language change.

6.2.2 Experimental Possibilities

There are a number of possible experimental routes which can be taken, serving to provide further support for the findings of this study, explore the nature of the demonstrated overt

verb raising in Japanese, and probe deeper into this matter of a split grammar.

Backing up The Claim

An important step would be to conduct another TVJT test which generates the same general findings; that is, to conduct the experiment again, seeking results that re-enforce the notion of a population split on the parameter of verb-raising. In order to make this research as solid as possible, this replication of the experiment should not be a total replication *per se*. One modification would be to work even harder to eliminate the possible confounding effects of modality and some lexical choices. Also important would be to review the previous work and determine whether any additional controls for focus could be added. However, the most important change would be to use a different quantifier in the same environment. As discussed at length in the previous chapter, Q>Neg results with *subete* were inconclusive as 'none' is an extreme case of 'not all.' For a more rigorous test, scenarios and test sentences can be constructed using numeral quantifiers which would not be subject to this problem.

Subject Quantifiers

Another question which TVJT can answer is exactly how far this observed overt verb raising extends in Japanese. Koizumi claims that the verb ends up at C^0, which is a step beyond most accounts, where the verb stops at T^0. Testing negation against subject quantifiers would be particularly revealing here, as it would establish whether negation can take scope over the subject. Structurally, this can only be the case where the verb is indeed all the way up at C^0, C-Commanding [Spec, TP]. Given that there was some debate over whether the subject is also under scope of negation in the scope literature, it may yet emerge that the grammar of Japanese is even further fragmented, with the raising grammar subdividing into T^0 and C^0 groups. A subject test would also be revealing for *wa* negation. Should McGloin's judgements prove correct, and negation is able to take scope over the subject as well, then either the analysis for the formation of *wa* negation presented here will need to be revised, or it will have to include matters of focus or information structure which might override syntactic scope.

Detecting the Split

A number of possible studies can be conducted in an effort to learn more about this split-grammar phenomenon. One possibility, suggested by the fact that the two sisters in the study patterned the same, would be to test whole families in the same condition. Given that parents and siblings are usually the primary sources of linguistic data for children acquiring language, it would be interesting to see whether children make the same decisions about verb raising as their family.

In and of themselves, children would be potentially illuminating participants in this study. With systematic enough testing, it should be possible to narrow down the exact age at which this split grammar manifests itself.

In addition to children, a wider selection of age groups subjected to the same test might generate some illuminating results. The currently observed split grammar could be a fleeting phenomenon, with an older generation tending more toward one parametric choice than the other, which might be an indicator that the split illustrates a language change in progress. However, while our sample here had a relatively limited age range, there was no evidence toward a correlation between age and responses.

One other possible avenue of research does exist: that of attempting to determine whether this is a true split in the population, or some sort of covert dialectal distinction. While this factor was not directly controlled in this study, informally gathered birthplace information for each participant indicates that geography is not a determining factor. Particularly with the Group Two participants, there was no single area of the country which seemed to favour one choice over the other. Thus, while research along this lines could be conducted, our outlook at this point is that the results would be inconclusive.

However, all of these projects are left for future research, as they are quite beyond the scope of this study. We have established a solid base upon which to claim that negation appears as a functional head relatively low in the phrase structure, and defer all research on the nature of the postulated split grammar and overt verb raising to future discussion.

Appendix A

Ethics Approval

Reproduced on the following pages are the letters of approval from the Office of Research Ethics. The original approval letter is given, followed by a second letter authorising a title change.

APPENDIX A*

SIMON FRASER UNIVERSITY

OFFICE OF RESEARCH ETHICS

BURNABY, BRITISH COLUMBIA
CANADA V5A 1S6
Telephone: 604-291-3447
FAX: 604-268-6785

November 20, 2003

Dennis Storoshenko
Graduate Student
Department of Linguistics
Simon Fraser University

Dear Dennis:

Re: Investigating the syntax of head-final languages

The above-titled ethics application has been granted approval by the Simon Fraser Research Ethics Board, at its meeting on November 17, 2003 in accordance with Policy R 20.01, "Ethics Review of Research Involving Human Subjects".

Sincerely,

Dr. Hal Weinberg, Director
Office of Research Ethics

* For inclusion in thesis/dissertation/extended essays/research project report, as submitted to the university library in fulfillment of final requirements for graduation. Note: correct page number required.

SIMON FRASER UNIVERSITY

OFFICE OF RESEARCH ETHICS
ROOM 2105 STRAND HALL

BURNABY, BRITISH COLUMBIA
CANADA V5A 1S6
Telephone: 604-291-3447
FAX: 604-268-6785

March 19, 2004

Mr. Dennis Storoshenko
Graduate Student
Department of Linguistics
Simon Fraser University

Dear Mr. Storoshenko:

Re: Negation scope and phrase structure in Japanese
Syntax of Head Final Languages
SSHRC
Title Change

In response to your request dated March 18, 2004, I am pleased to approve, on behalf of the Research Ethics Board, the title change from Investigating the syntax of head-final languages, in the research protocol of the above referenced Request for Ethical Approval of Research originally approved on October 14, 2003.

Best wishes for continued success in this research.

Sincerely,

Dr. Hal Weinberg, Director
Office of Research Ethics

c: Dr. Chung-hye Han, Supervisor
Yasuko Sakurai, Co-Investigator

/jmy

Appendix B

List of Abbreviations

These are the abbreviations used in the glosses throughout this thesis.

NOM: Nominative

ACC: Accusative

DAT: Dative

GEN: Genitive

NL: Nominaliser

TOP: Topic

PST: Past

NPST: Nonpast

COP: Copula

CL: Classifier

V: Verb

T: Tense Marker

C: Complementiser

Q: Question Marker

PRT: Particle

Appendix C

Scenario Descriptions and Stimulus Sentences

A complete listing of all scenarios is given below for each condition. The necessary props are listed for each, along with a brief description of the action. This is followed by the observer's sentence for each scenario. In each Condition, the scenarios are given in the order of presentation, and for the training and filler scenarios, the expected responses are indicated. As the training scenarios remained constant across all conditions, they are presented separately, and not with each condition. Also note that the third training scenario has two associated sentences; this is the scenario designed to control for erroneous judgements based on modality.

C.1 Training Scenarios: All Conditions

- Training 1(F): rock, fence, horse, camel, dinosaur

  All three animals jump over a rock. The horse and the camel jump over the fence, but the dinosaur does not.

  (82) Doobutsu-sam-biki-ga saku-o tobi-koe-ta.
  animal-three-CL-NOM fence-ACC jump-over-PST
  'Three animals jumped over the fence.'

- Training 2(T): tree trunk, elephant, giraffe, dinosaur

The dinosaur and the giraffe climb up onto the tree trunk. The elephant does not.

(83) Doobutsu-ni-hiki-dake-ga kirikabu-ni nobot-ta.
animal-two-CL-only-NOM tree trunk-onto climb-PST
'Only two animals climbed up the tree trunk.'

- Training 3.1(F): rock, fence, horse

  The horse jumps over the rock, but does not jump over the fence.

(84) Uma-ga iwa-o tobi-koe-na-katta.
horse-NOM rock-ACC jump-over-NEG-PST
'The horse did not jump over the rock.'

- Training 3.2(T): same as 3.1

(85) Uma-ga saku-o tobi-koe-na-katta.
horse-NOM fence-ACC jump-over-NEG-PST
'The horse did not jump over the fence.'

C.2 Condition One: Plain Negation-Q>Neg

- Test 1: Grandpa, Lisa, 3 rings, 3 balloons, 400 yen

  Grandpa is selling rings and balloons. Lisa has 400 yen, and pays 100 yen to buy all three balloons. Each of the rings has a price higher than 300 yen. Lisa doesn't buy any of the rings because she can't afford any.

(86) Lisa-ga yubiwa-subete-o kaw-ana-katta.
Lisa-NOM ring-all-ACC buy-NEG-PST
'Lisa did not buy all the rings.'

- Test 2: Donald Duck, 3 watermelons, 3 oranges

  Donald is hungry. He eats the three pieces of watermelon, but does not eat any of the oranges.

(87) Donarudo-ga orenji-subete-o tabe-na-katta.
Donald-NOM orange-all-ACC eat-NEG-PST
'Donald did not eat all the oranges.'

- Filler 1(T): elephant, monkey, frog, 3 rocks, tree trunk

  The animals each climb onto a rock. The monkey and the frog then climb up the tree trunk, but the elephant does not.

  (88) Zou-ga kirikabu-ni nobori-wa shi-na-katta.
  elephant-NOM tree trunk-onto climb-TOP do-NEG-PST
  'The elephant did not climb onto the tree trunk.'

- Test 3: Homer, 3 cars, 3 airplanes

  Homer washes three airplanes, but does not wash the cars.

  (89) Otokonohito-ga kuruma-subete-o araw-ana-katta.
  man-NOM car-all-ACC wash-NEG-PST
  'The man did not wash all the cars.'

- Filler 2(F): Lisa, Homer, Marge, Grandpa, mirror, comb, 2 rings, 300 yen

  Marge sells the mirror, Homer the comb, and Grandpa the rings. Lisa has 300 yen, and buys the mirror and the comb for 100 yen each. The rings cost 400 yen, so Lisa doesn't buy them because she can't afford them.

  (90) On'nanohito-ga Lisa-ni kagami-o uri-wa shi-na-katta.
  woman-NOM Lisa-to mirror-ACC sell-WA do-NEG-PST
  'The woman did not sell the ring to Lisa.'

- Filler 3(F): Homer, Grandpa, Burns, 3 rocks

  Each man lifts up a rock. Each then tries to throw his rock, but only Homer succeeds.

  (91) Otokonohito-subete-ga iwa-o nage-ta.
  man-all-NOM rock-ACC throw-PST
  'All the men threw a rock.'

- Test 4: Homer, 3 dogs, 3 elephants

  Homer works at a zoo and wants to know how much the animals weigh. He picks up all the dogs, but does not pick up any of the elephants because they are too heavy.

(92) Otokonohito-ga zou-subete-o mochi-age-na-katta.
man-NOM elephant-all-ACC lift-up-NEG-PST
'The man did not lift up all the elephants.'

- Filler 4(T): 3 dinosaurs, 3 turtles, tree trunk

  The three dinosaurs try to climb up the tree trunk, but fall off. The three turtles climb up the tree trunk.

(93) Kyooryuu-subete-ga kirikabu-kara ochi-ta.
dinosaur-all-NOM tree trunk-from fall-PST
'All the dinosaurs fell from the tree trunk.'

C.3 Condition Two: Plain Negation-Neg>Q

- Test 1: Grandpa, Lisa, 3 rings, 3 balloons, 400 yen

  Grandpa is selling rings and balloons. Lisa has 400 yen, and pays 100 yen to buy all three balloons. She then pays 100 yen each for two of the rings. The third ring costs 200 yen, so Lisa does not buy it.

(94) Lisa-ga yubiwa-subete-o kaw-ana-katta.
Lisa-NOM ring-all-ACC buy-NEG-PST
'Lisa did not buy all the rings.'

- Test 2: Donald Duck, 3 watermelons, 3 oranges

  Donald is hungry. He eats the three pieces of watermelon, then eats two pieces of orange. He does not eat the third.

(95) Donarudo-ga orenji-subete-o tabe-na-katta.
Donald-NOM orange-all-ACC eat-NEG-PST
'Donald did not eat all the oranges.'

- Filler 1(T): elephant, monkey, frog, 3 rocks, tree trunk

  The animals each climb onto a rock. The monkey and the frog then climb up the tree trunk, but the elephant does not.

(96) Zou-ga kirikabu-ni nobori-wa shi-na-katta.
elephant-NOM tree trunk-onto climb-TOP do-NEG-PST
'The elephant did not climb onto the tree trunk.'

- Test 3: Homer, 3 cars, 3 airplanes

  Homer washes the three airplanes. He also washes two of the cars, but not the third.

(97) Otokonohito-ga kuruma-subete-o araw-ana-katta.
man-NOM car-all-ACC wash-NEG-PST
'The man did not wash all the cars.'

- Filler 2(F): Lisa, Homer, Marge, Grandpa, mirror, comb, 2 rings, 300 yen

  Marge sells the mirror, Homer the comb, and Grandpa the rings. Lisa has 300 yen, and buys the mirror and the comb for 100 yen each. The rings cost 400 yen, so Lisa doesn't buy them because she can't afford them.

(98) On'nanohito-ga Lisa-ni kagami-o uri-wa shi-na-katta.
woman-NOM Lisa-to mirror-ACC sell-WA do-NEG-PST
'The woman did not sell the ring to Lisa.'

- Filler 3(F): Homer, Grandpa, Burns, 3 rocks

  Each man lifts up a rock. Each then tries to throw his rock, but only Homer succeeds.

(99) Otokonohito-subete-ga iwa-o nage-ta.
man-all-NOM rock-ACC throw-PST
'All the men threw a rock.'

- Test 4: Homer, 3 dogs, 3 elephants

  Homer works at a zoo and wants to know how much the animals weigh. He picks up all the dogs, then two of the elephants. He does not pick up the third because it is too heavy.

(100) Otokonohito-ga zou-subete-o mochi-age-na-katta.
man-NOM elephant-all-ACC lift-up-NEG-PST
'The man did not lift up all the elephants.'

- Filler 4(T): 3 dinosaurs, 3 turtles, tree trunk

  The three dinosaurs try to climb up the tree trunk, but fall off. The three turtles climb up the tree trunk.

  (101) Kyooryuu-subete-ga kirikabu-kara ochi-ta.
  dinosaur-all-NOM tree trunk-from fall-PST
  'All the dinosaurs fell from the tree trunk.'

C.4 Condition Three: *wa* Negation-Q>Neg

- Test 1: Grandpa, Lisa, 3 rings, 3 balloons, 400 yen

  Grandpa is selling rings and balloons. Lisa has 400 yen, and pays 100 yen to buy all three balloons. Each of the rings has a price higher than 300 yen. Lisa doesn't buy any of the rings because she can't afford any.

  (102) Lisa-ga yubiwa-subete-o kai-wa shi-na-katta.
  Lisa-NOM ring-all-ACC buy-TOP do-NEG-PST
  'Lisa did not buy all the rings.'

- Test 2: Donald Duck, 3 watermelons, 3 oranges

  Donald is hungry. He eats the three pieces of watermelon, but does not eat any of the oranges.

  (103) Donarudo-ga orenji-subete-o tabe-wa shi-na-katta.
  Donald-NOM orange-all-ACC eat-TOP do-NEG-PST
  'Donald did not eat all the oranges.'

- Filler 1(T): elephant, monkey, frog, 3 rocks, tree trunk

  The animals each climb onto a rock. The monkey and the frog then climb up the tree trunk, but the elephant does not.

  (104) Zou-ga kirikabu-ni nobor-ana-katta.
  elephant-NOM tree trunk-onto climb-NEG-PST
  'The elephant did not climb onto the tree trunk.'

- Test 3: Homer, 3 cars, 3 airplanes

  Homer washes three airplanes, but does not wash the cars.

  (105) Otokonohito-ga kuruma-subete-o arai-wa shi-na-katta.
  man-NOM car-all-ACC wash-TOP doNEG-PST
  'The man did not wash all the cars.'

- Filler 2(F): Lisa, Homer, Marge, Grandpa, mirror, comb, 2 rings, 300 yen

  Marge sells the mirror, Homer the comb, and Grandpa the rings. Lisa has 300 yen, and buys the mirror and the comb for 100 yen each. The rings cost 400 yen, so Lisa doesn't buy them because she can't afford them.

  (106) On'nanohito-ga Lisa-ni kagami-o ur-ana-katta.
  woman-NOM Lisa-to mirror-ACC sell-NEG-PST
  'The woman did not sell the ring to Lisa.'

- Filler 3(F): Homer, Grandpa, Burns, 3 rocks

  Each man lifts up a rock. Each then tries to throw his rock, but only Homer succeeds.

  (107) Otokonohito-subete-ga iwa-o nage-ta.
  man-all-NOM rock-ACC throw-PST
  'All the men threw a rock.'

- Test 4: Homer, 3 dogs, 3 elephants

  Homer works at a zoo and wants to know how much the animals weigh. He picks up all the dogs, but does not pick up any of the elephants because they are too heavy.

  (108) Otokonohito-ga zou-subete-o mochi-age-wa shi-na-katta.
  man-NOM elephant-all-ACC lift-up-TOP doNEG-PST
  'The man did not lift up all the elephants.'

- Filler 4(T): 3 dinosaurs, 3 turtles, tree trunk

  The three dinosaurs try to climb up the tree trunk, but fall off. The three turtles climb up the tree trunk.

  (109) Kyooryuu-subete-ga kirikabu-kara ochi-ta.
  dinosaur-all-NOM tree trunk-from fall-PST
  'All the dinosaurs fell from the tree trunk.'

C.5 Condition Four: *wa* Negation-Neg>Q

- Test 1: Grandpa, Lisa, 3 rings, 3 balloons, 400 yen

  Grandpa is selling rings and balloons. Lisa has 400 yen, and pays 100 yen to buy all three balloons. She pays 100 yen each for two rings, but does not buy the third because it costs 200 yen and she can't afford it.

  (110) Lisa-ga yubiwa-subete-o kai-wa shi-na-katta.
  Lisa-NOM ring-all-ACC buy-TOP do-NEG-PST
  'Lisa did not buy all the rings.'

- Test 2: Donald Duck, 3 watermelons, 3 oranges

  Donald is hungry. He eats the three pieces of watermelon, and two pieces of orange. He does not eat the third piece.

  (111) Donarudo-ga orenji-subete-o tabe-wa shi-na-katta.
  Donald-NOM orange-all-ACC eat-TOP do-NEG-PST
  'Donald did not eat all the oranges.'

- Filler 1(T): elephant, monkey, frog, 3 rocks, tree trunk

  The animals each climb onto a rock. The monkey and the frog then climb up the tree trunk, but the elephant does not.

  (112) Zou-ga kirikabu-ni nobor-ana-katta.
  elephant-NOM tree trunk-onto climb-NEG-PST
  'The elephant did not climb onto the tree trunk.'

- Test 3: Homer, 3 cars, 3 airplanes

  Homer washes three airplanes, and two of the cars. He does not wash the last car.

  (113) Otokonohito-ga kuruma-subete-o arai-wa shi-na-katta.
  man-NOM car-all-ACC wash-TOP doNEG-PST
  'The man did not wash all the cars.'

- Filler 2(F): Lisa, Homer, Marge, Grandpa, mirror, comb, 2 rings, 300 yen

Marge sells the mirror, Homer the comb, and Grandpa the rings. Lisa has 300 yen, and buys the mirror and the comb for 100 yen each. The rings cost 400 yen, so Lisa doesn't buy them because she can't afford them.

(114) On'nanohito-ga Lisa-ni kagami-o ur-ana-katta.
woman-NOM Lisa-to mirror-ACC sell-NEG-PST
'The woman did not sell the ring to Lisa.'

- Filler 3(F): Homer, Grandpa, Burns, 3 rocks

  Each man lifts up a rock. Each then tries to throw his rock, but only Homer succeeds.

(115) Otokonohito-subete-ga iwa-o nage-ta.
man-all-NOM rock-ACC throw-PST
'All the men threw a rock.'

- Test 4: Homer, 3 dogs, 3 elephants

  Homer works at a zoo and wants to know how much the animals weigh. He picks up all the dogs, and two of the elephants. He does not pick up the third because it is too heavy.

(116) Otokonohito-ga zou-subete-o mochi-age-wa shi-na-katta.
man-NOM elephant-all-ACC lift-up-TOP doNEG-PST
'The man did not lift up all the elephants.'

- Filler 4(T): 3 dinosaurs, 3 turtles, tree trunk

  The three dinosaurs try to climb up the tree trunk, but fall off. The three turtles climb up the tree trunk.

(117) Kyooryuu-subete-ga kirikabu-kara ochi-ta.
dinosaur-all-NOM tree trunk-from fall-PST
'All the dinosaurs fell from the tree trunk.'

Appendix D

Debriefing Questions

Here, the list of debriefing questions used at the end of each data collection session is presented. The order in which they are presented is not particularly significant, as participants' responses dictated the flow of conversation. This should be regarded as more of a checklist than a script. With each question, an explanation of its general purpose, and the results obtained are provided. Where there is already significant discussion of the question in the main body text, the comments here will be brief.

- What do you think the experiment was about?

  This was a general question, essentially designed to see how salient the scope ambiguity problem was to our participants. It emerged that this question became an important metric in determining the extent to which the use of the non-native speaker in the observer role had an effect on the data.

- Did you notice anything about the stories and Mickey's statement?

  The portion of this question regarding the stories is another indirect method of eliciting a comment on scope ambiguity. In terms of Mickey's statement, this was designed to determine whether the sentences used a jarringly odd structure, or if the non-native speaker's accent was detrimental to the experiment.

- Did you ever hesitate between "true" or "false"? If so, when?

  Again, a slightly more direct way of determining whether the sentences were ambiguous.

- Were some of the statements easier to assess than others?

  Yet another question designed to test whether the participant felt the statement was ambiguous.

- Could any of Mickey's statements have been true and false at the same time?

  This is the final direct question. As these three questions are related, if a participant had already claimed the sentences were ambiguous, then the subsequent more direct questions could be omitted. Interestingly, these questions also brought to light some of the problems with modality. Participants stated that some scenarios were harder to evaluate or possibly ambiguous due to a confusion between *didn't* and *couldn't*.

- When was Mickey wrong, and what kinds of things did he get wrong?

  This was the question where participants reviewed each "false" response and justified their answers. This was important both in ensuring that participants were not answering based on modality, and it provided an opportunity for participants to state that a certain scope reading was not available.

Bibliography

Chomsky, N. (1995) *The Minimalist Program*, MIT Press, Cambridge, MA.

Cowart, W. (1997) *Experimental Syntax*, SAGE Publications, Thousand Oaks, CA.

Crain, S., and R. Thornton (1998) *Investigations in Universal Grammar: A Guide to Experiments on the Acquisition of Syntax and Semantics*, MIT Press, Cambridge, MA.

Embick, D., and R. Noyer (2001) "Movement Operations after Syntax," *Linguistic Inquiry* 32:4, 555–595.

Emonds, J. (1978) "The Verbal Complex V'-V in French," *Linguistic Inquiry* 9, 151–175.

Fukui, N., and H. Sakai (2003) "The Visibility Guideline for Functional Categories: Verb Raising in Japanese and Related Issues," *Lingua* 113, 321–375.

Fukushima, K. (1998) "Negation in the Lexicon, not NP," in M. C. Gruber, D. Higgins, K. S. Olson, and T. Wysocki, eds., *CLS 34: The Main Session*, The Chicago Linguistic Society, 171–184.

Hagstrom, P. (1995) "Negation, Focus, and *do*-support in Korean," manuscript, MIT.

Han, C.-H., J. Lidz, and J. Musolino (2003) "Verb-Raising and Grammar Competition in Korean: Evidence from Negation and Quantifier Scope," manuscript, Simon Fraser University, Northwestern University, Indiana University.

Hoji, H. (1995) *Logical Form and Configurational Structures in Japanese*, Doctoral dissertation, University of Washington.

Hoji, H. (1998) "Null Object and Sloppy Identity in Japanese," *Linguistic Inquiry* 29, 127–152.

Isoda, M. (1991) "The Light Verb Construction in Japanese," in L. M. Dorbin, L. Nichols, and R. M. Rodriguez, eds., *Proceedings of the Chicago Linguistic Society*, volume 27, Chicago Linguistic Society, 261–275.

Kato, Y. (1983) "Negation and Focus in Japanese," *Sophia Linguistica* 11, 83–94.

Kato, Y. (1988) "Negation and the Discourse Dependent Property of Relative Scope," *Sophia Linguistica* 23-24, 31–37.

Kato, Y. (1993) "Negative Polarity, Feature Checking, and an Inflection Parameter," *Sophia Linguistica* 33, 85–99.

Kayne, R. S. (1994) *The Antisymmetry of Syntax*, MIT Press, Cambridge, MA.

Kim, A. H.-O. (1995) "Word Order at the Noun Phrase Level in Japanese," in P. Downing and M. Noonan, eds., *Word Order in Discourse*, John Benjamins Publishing Company, Philadelphia, PA, 199–246.

Kitahara, H. (1993) "Numeral Classifier Phrases Inside DP and the Specificity Effect," in S. Choi, ed., *Japanese Korean Linguistics 3*, CSLI, Stanford, CA, 171–186.

Kitamoto, M. (1986) "The Relative Scope of Negation and Quantification in Japanese," *Descriptive and Applied Linguistics* 19, 115–126.

Koizumi, M. (1995) *Phrase Structure in Minimalist Syntax*, Doctoral dissertation, MIT.

Koizumi, M. (2000) "String Vacuous Overt Verb Raising," *Journal of East Asian Linguistics* 9, 227–285.

Kroch, A. (1989) "Reflexes of Grammar in Patterns of Language Change," *Language Variation and Change* 1, 199–244.

Kuno, S. (1973) *The Structure of the Japanese Language*, MIT Press, Cambirdge, MA.

Kuno, S. (1980) "The Scope of Question and Negation in Some Verb-Final Languages," in J. Kreiman and A. E. Ojeda, eds., *Proceedings of the Chicago Linguistic Society*, volume 16, Chicago Linguistic Society, 155–169.

Kuroda, S. Y. (1979) *Generative Grammatical Studeis in Japanese Language*, Garland Publishing, New York, London.

Lidz, J., and J. Musolino (2002) "Children's Command of Quantification," *Cognition* 84, 113–154.

McGloin, N. H. (1986) *Negation in Japanese*, Boreal Scholarly Publishers and Distributors, Ltd, Edmonton, AB.

McGloin, N. H. (1987) "The Role of wa in Negation," in J. Hinds, S. K. Maynard, and S. Iwasaki, eds., *Perspectives on Topicalization The Case of Japanese Wa*, John Benjamins Publishing Company, 165–183.

Miyagawa, S. (2001) "The EPP, Scrambling, and *Wh*-in-Situ," in M. Kenstowicz, ed., *Ken Hale: A Lite in Language*, MIT Press, Cambridge, MA, 293–338.

Miyagawa, S. (2002) "The Nature of Weak Isalnds," Conference Handout, KGGC Summer School.

Oishi, H. (1986) *Scope Interpretation of Negation in Japanese*, Doctoral dissertation, University of Michigan.

Ota, A., and Y. Kato (1986) "The Relative Scope of Neg and Quantifiers in English and Japanese," *Sophia Linguistica* 20-21, 25–40.

Otani, K., and J. Whitman (1991) "V-Raising and VP-Ellipsis," *Linguistic Inquiry* 22:2, 345–358.

Pollock, J.-Y. (1989) "Verb Movement, Universal Grammar, and the Structure of IP," *Linguistic Inquiry* 20:3, 365–424.

Reuland, E. (2000) "Explaining Burzio's Generalization: Exploring the Issues," in E. Reuland, ed., *Arguments and Case: Explaining Burzio's Generalization*, John Benjamins Publishing Company, Philadelphia, PA, 1–11.

Rizzi, L. (1990) *Relativized Minimality*, MIT Press, Cambridge, MA.

Ross, J. (1983) "Inner Islands," in *Proceedings of the Tenth Meeting of the Berkeley Linguistics Society*, 258–265.

Sohn, K.-W. (1996) "Scope Interpretation without Rigidity Condition," in H. Camacho, L. Choueiri, and M. Watanabe, eds., *The Proceedings of the Fourteenth West Coast Conference on Formal Linguistics*, Stanford, CA, CSLI, 463–476.

Sugai, K. (1993) "A Symbolic Analysis on the Scope of Negation," *Nagoya Working Papers in Linguistics* 9, 95–116.

Yatabe, S. (1996) "Negation and Focusing in the Grammar of Japanese," in T. Gunji, ed., *Studies on the Universality of Constraint-Based Phrase Structure Grammars*, Osaka University, Osaka, Japan, 217–225.