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This dissertation is a syntactic and semantic description of a fragment of Japanese within the grammatical framework that is a combination of a transformational generative grammar and Montague grammar (or a transformational Montague grammar). All the syntactic rules of the grammar are maintained to be optional and unordered, and attempts are made, wherever possible, to achieve linguistically significant generalizations in developing a grammar of Japanese within this combined framework. Specific constructions that are discussed include: predicate nominals, quantifiers, reflexivization, conjunction, negation, passivization, causativization, and common nouns that appear in isolation within any modifier. Each of these and other related constructions are examined and their syntax and semantics are characterized within the framework of a transformational Montague grammar.
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CHAPTER I

INTRODUCTION

0. Outline of chapter.

This chapter serves as a general introduction to the dissertation. In section 1 the framework of inquiry we assume in the entire work is presented with some reasons for doing so. In section 2 we limit the scope of inquiry to be carried out within this framework to certain specific domains of investigation. Certain limitations of inquiry are laid out. The section ends with a summary of each chapter and appendix, followed by brief explanation on examples and footnotes.


The framework we will be working within is a combination of Montague grammar and a transformational generative grammar (or a transformational Montague grammar à la Partee (1979)). The basic notions of Montague grammar are to be found in Montague (1974)\(^1\), particularly in the papers "English as a formal language" (hereafter EFL), "Universal grammar" (here-
after UG), and "The proper treatment of quantification in ordinary English" (hereafter PTQ). These papers are mostly written in a very formal and rigorous fashion, containing "a great deal of formidable notation and relatively little prose" (Partee (1975: 211)) and, unfortunately, make quite difficult reading, especially for those without a background in formal systems. For more comprehensible and accessible introductions to Montague's ideas and approaches, the reader is referred to Thomason's introduction to Montague (1974), Partee (1975), Dowty (1978b), and Halvorsen and Ladusaw (1979).²

I regard the central tasks of a grammar³ to be:

1) to define the sentences of a language L,
2) to define the notion truth in L, and
3) to define entailments in L.

Montague grammar provides us with a framework of description that will meet these three requirements in a systematic way as applied to natural language. The grammar is probably the first of this kind although similar techniques have been employed matter-of-factly in formal logic for some time. While Montague carried out tasks (2) and (3) in an elegant and refined manner, his syntax was far from satisfactory in relation to task (1), missing important syntactic generaliza-
tions. One look at the syntactic rules in PTQ will make this obvious. For example, he treats a sequence like believe that to be a single verb, failing to distinguish the verb and the complementizer. Or, his rules having to do with the English auxiliary system miss the original insight noted in Chomsky (1957). For obvious reasons like these we will assume the syntax of our grammar to be a transformational syntax, as suggested in Partee (1975). Works espousing this position include Cooper (1975), Siegel (1976), Carlson (1978), etc.; Partee (1976), Heny and Schnelle (1979), and Davis and Mithun (1979) contain papers having to do with the improvement of Montague syntax as well as papers on other equally interesting topics in Montague grammar. Since one of the central features of Montague grammar is the compositionality of semantic interpretation, the unrestrained use of grammatical transformations always engenders the possibility of reducing this principle to near triviality, devoid of its empirical content. As was the case with transformational grammarians, Montague grammarians thus have to work on constraining transformations, which is not a trivial task (cf. Partee (1979)). While I do not go into this problem in this dissertation, the proposed transformations, I believe, are all within the domain of "officially allowable" ones. In adopting Montague grammar for our framework of inquiry, we will be using a variant of PTQ grammar, modified with transformational syntax; the overall framework may be represented as Fig. 1.
a grammar of a language L

L syntax
- Lexicon
- Transformational Syntax
  - L sentences
  - L Phonology

Translation Rules
- Logical Structure
  - Logical Appraisal (entailments, etc.)

Intensional Logic
- Lexicon
- Formation Rules
  - Semantics (for L and IL)
    - Interpretation (based on models)
      - Meaning Postulates
2. **Scope of inquiry.**

The main aim of this dissertation is to develop and present a grammar of Japanese that fulfills the three central requirements noted in the preceding section for a fragment of the Japanese language within the combined framework of Montague grammar and a transformational generative grammar as outlined above. So far as I know, with the possible exception of Sakai (1979), no such attempt has been made toward this goal, and this fact alone, I believe, provides, to a certain extent, the *raison d'être* for the work represented below. In working toward this central goal, we will take up two sub-tasks: 1) we will attempt, wherever possible, to achieve linguistically significant syntactic generalizations in describing Japanese within Montague grammar, and 2) we will examine several problems that will arise in systematically interpreting Japanese nouns and give, if appropriate, possible solutions thereof. The scope of the present inquiry is limited by the fact, among others, that linguistic constructions that involve mass nouns and abstract nouns are systematically excluded from the discussion except for a few complement structures and that the Japanese lexicon is drastically reduced to a handful. The latter limitation may not be of much theoretical significance, but the former surely is disheartening. Ultimately these are to be integrated into a more comprehensive grammar of Japanese, but at
present, such integration seems to require special considera-
tions, both syntactic and semantic\textsuperscript{[10]}; consequently work on
mass and abstract nouns as well as their integration with the
present work is left as a future task for some student
interested in Japanese. Undoubtedly many further limitations
would apply to the present inquiry, and some are tacitly
assumed throughout the entire work while less obvious ones
are noted where appropriate. In a word, then, the present
inquiry is a description of a fragment of Japanese within
the grammatical framework outlined in section 1, centering
on various syntactic constructions having to do with relations
that obtain between individuals or their related phenomena.\textsuperscript{[11]}
The dissertation will proceed as follows.

In Chapter II a particular view is expressed on the
grammatical relations in Japanese, together with a proposed
means for representing them, which is to serve as a core
for the syntactic description of Japanese in the ensuing
discussion.

Chapter III is an examination of predicate nominals.
Rules are presented to capture their basic properties,
with discussion on several types of sentences that take this
construction. Ways are also provided for producing several
derivative nominals, together with examination of some of
the semantic problems they incur.
Chapter IV deals with Japanese quantifiers. Sample representative quantifiers are examined with respect to their syntactic and semantic characteristics; how they behave alone and in relation to one another in a sentence.

Chapter V examines several basic and much discussed syntactic constructions within our framework: reflexivization, conjunction, negation, passivization, causativization and some related constructions. The standard transformational approach that requires both rule ordering and obligatory rule application is reexamined from our present viewpoint.

The sixth chapter presupposes much of what is discussed in chapters II through V, the arguments often being based on grammatical constructions as analyzed in those chapters. Problems that will arise with respect to achieving syntactic and semantic generalizations about common nouns that appear in isolation without any modifier are explored, and a proposal is made as to how one might go about it, avoiding some of the difficulties that would be encountered. A special type of bare common noun — a relative clause is also discussed with special attention on the restrictive and nonrestrictive distinction.

Chapter VII is a presentation of the fragment grammar of Japanese, serving also as a concise summary of the preceding chapters.
Appendix A lists symbols and terminological conventions assumed in the present work. Appendices B and C provide supplementary arguments for some of the points in Chapter V. Appendix D is a brief discussion on generics.

Japanese sentences used as examples are all glossed, first word for word, then by English sentences throughout the entire work. Examples and quotations are numbered chapter by chapter. Each chapter ends with footnotes to the chapter indicated with superscript numerals. Examples and quotations in each footnote are numbered by means of small Roman numerals.
Footnotes to Chapter I

1 Two review articles, Parsons (1975) and Cooper (1977), contain a list of certain misprints in the book. Cooper (1977) also serves as a very concise introduction to Montague's basic notions salient in his enterprise.

2 For those who find EFL, UG, and PTQ no problem in reading, these are probably dispensable. The list reflects my own personal preference. Someone might, for instance, recommend Cresswell (1973) in spite of some differences in approach and treatment since there is no doubt that the understanding of the book will facilitate the understanding of Montague grammar. Being linguistically initiated, I, for one, regard Dowty (1978b) as most rewarding of the four introductions mentioned in the text.

3 That is, a grammar of declarative sentences. Interrogatives and imperatives, for instance, would require separate treatment, which are not considered in the present inquiry. For the syntax and semantics of questions in Montague grammar, see, for example, Hamblin (1976), Karttunen (1977), Bennett (1977, 1979a), etc. Truth in Montague grammar is a contradictory of falsehood; that is, the truth value is two-valued, either true or false. Treatments of some types of presupposition and Gricean conventional implicature are presented in
Karttunen and Peters (1975, 1979) within the framework of Montague grammar.

4 This is not to say that Chomsky (1957) is wholly adequate in its treatment. What is significant, though, is that Chomsky made it clear, probably for the first time, that there was an important syntactic generalization to be sought in the English auxiliary system.

5 Partee (1975) gives some justification for transformations, and the need for labelled bracketing. Bennett (1975) starts out without labelled bracketing and transformations and ends up with the indication that Montague grammar be enriched with grammatical transformations.

6 On the side of transformational grammarians, see, for instance, important works like Ross (1967), Emonds (1970), etc.

7 The syntactic categories CN (= common noun) and IV (= intransitive verb) and their corresponding semantic type are based on the idea first introduced in Bennett (1975).

8 As the author admits (p.2), Sakai (1979) is rather an introduction to higher-order logic, assuming no prior knowledge of formal logic on the part of the reader, much
less Montague grammar; consequently much less attention is paid to justifying syntactic analyses than to applying the basic notions in various kinds of logic to the description of Japanese. I will not attempt any criticism of his Japanese syntax in this dissertation since, the nature of the book being as it is, I think it is not fair to do so. Instead, as is made clear in section 1, I have worked entirely in the context of transformational tradition in refuting or presenting specific syntactic analyses.

9 See papers like Delacruz (1976) and Bennett (1979b) for possible directions on these issues. See also footnote 3.

10 On the issue of one-many relation between a natural language category and semantic types, see Parsons (1979), which offers possible extension of a grammar toward unifying treatments of individuals, mass, and abstract notions in syntax within Montague grammar.

11 The precise intent of this remark is to be made clear later in the text.
CHAPTER II

ON REPRESENTING JAPANESE SENTENCE STRUCTURES

0. Introduction.

This chapter outlines how basic Japanese sentence structures are to be represented in our syntax. The proposed representation serves as the basis of discussion in the chapters to follow. In section 1 we briefly give indications as to why the linear strings of PTQ English syntax are better replaced by strings with labelled bracketings by pointing out some internal inadequacies of the syntax. Then in section 2 we examine how one may obtain labelled bracketings without violating certain requirements imposed on our general approach. In section 3 our particular view is expressed, after a brief discussion of case particles in Japanese (3.0), as to what structural (3.1) and relational (3.2) information is to be overtly specified in the representation of Japanese sentences, followed by sample illustrations (3.3). Section 4 is a summary of the chapter.
1. **Labelled bracketing.**

Since we have decided to adopt a transformational syntax in our grammar, the need for the labelled bracketing or its formal equivalent like a tree diagram is a prerequisite for successful application of transformational rules as we understand them, the operation being defined over proper analyses of strings based on finite partitioning into grammatical categories. The PTQ syntax also has transformation-like operations, but these are all defined on linear strings of expressions of the language being described. Operations on such bracket-free linear strings of symbols often predict wrong forms or render it impossible to state obvious syntactic generalizations. Partee (1975) notes, for instance, that rule S4 of PTQ, given below as (1), incorrectly produces sentences like (2).

1) (PTQ S4)

\[ \text{If } \alpha \in P_{t/\text{IV}} \text{ and } \delta \in P_{\text{IV}}, \text{ then } F_4(\alpha, \delta) \in P_{t}, \]

where \( F_4(\alpha, \delta) = \alpha \delta' \) and \( \delta' \) is the result of replacing the first verb (i.e., member of \( B_{\text{IV}}, B_{TV}, B_{IV/t}, \) or \( B_{IV/IV} \)) in \( \delta \) by its third person singular present.

2) (133 in Partee (1975))

*John walks and talk.*
This is so because the rule refers to "the first" verb in the verb phrase. So long as one sticks to the linear information, there seems to be no non-arbitrary way to improve the situation because of sentences like:

3) (= (136) in Partee (1975))

   a. John tries to walk and talk.
   b. John tries to walk and talks.

Clearly what one needs is the notion "main verb" defined over sentences, and the most natural means for such definition seems to be by way of sentence structures of the usual sort represented by labelled bracketing. For similar examples, presented for different purpose, see section 2.7 in Partee (1979).

Whenever reference is made to "the first" such-and-such, then, there is the danger of producing wrong results of the above sort. While the problem does not crop up in PTQ, a slight enlargement of the lexicon creates another of this kind of problem. Note that in PTQ the gender of a noun phrase is determined according to the gender of the first basic noun or noun phrase.

4) (= PTQ S14)

   If $\alpha \in P_T$ and $\phi \in P_t$, then $F_{10,n}(\alpha, \phi) \in P_t$, where
either (i) $\alpha$ does not have the form $he_k$, and $F_{10,n}(\alpha,\phi)$ comes from $\phi$ by replacing the first occurrence of $he_n$ or $him_n$ by $\alpha$ and all other occurrences of $he_n$ or $him_n$ by \{he\} or \{him\} respectively, according as the gender of the first

$B_{CN}$ or $B_T$ in $\alpha$ is \{masc.\} \{fem.\} \{neuter\}, or (ii) $\alpha = he_k$, and $F_{10,n}(\alpha,\phi)$ comes from $\phi$ by replacing all occurrences of $he_n$ or $him_n$ by $he_k$, or $him_k$ respectively.

But suppose we included in the lexicon an expression like park attendant. S14 above then is responsible for sentences like:

5) *Every park attendant loves it.\(^4\)

If PTQ had a rule for adjective-noun combination, S14 would also generate a sentence like:

6) *John found a man-made object and tried to eat him.

granted that the first man is the same man in the basic
lexicon. Clearly what is needed is a definition of the notion "head noun" in the noun phrase or noun compound. Again the availability of labelled bracketing seems to provide the most natural way out of this difficulty.

I must hasten to add that the labelled bracketing, although probably necessary, is not sufficient to characterize the gender of a noun phrase because, as is well known, this information must sometimes be transferred.

7) a. the one who is pregnant
   b. a buxom neighbor
   c. people who have graduated from this women's college

So if the gender of a pronoun bound with some noun phrase is to be determined in the syntax, which is not a trivial assumption, we need something in addition to the labelled bracketing. But I hope that it is now clear that even within the framework of PTQ, the labelled bracketing is a desideratum. This desideratum becomes, as was mentioned at the beginning of this section, a prerequisite for the application of our syntactic rules since many of them are formal equivalents of the standard transformational rules. We now turn to the problem of obtaining labelled bracketings for a string of expressions of a language.
2. On assigning labelled bracketings.

Although phrase structure rules, that is, a rewriting system with certain conditions on rewrite rules, are known to lead to a satisfactory labelled bracketing representation (or a phrase marker or a tree diagram) of a string of expressions, the labelled bracketing representation itself is independent of such rules. Indeed one may attempt to reach the same representation by different methods. Such concern for obtaining a labelled bracketing may seem rather a meaningless trifle for generative grammarians, but the problem is real enough for anyone working within Montague grammar (hereafter MG) who wishes to have grammatical transformations. This is so because there is one important respect in which rules of MG syntax drastically differ from PS rules linguists are familiar with. That is, each syntactic rule of MG syntax is a statement of recursive characterization of membership of a certain category. That is to say, given a rule like:

\[ 8) \text{If } \alpha_1 \in P_{A_1}, \alpha_2 \in P_{A_2}, \ldots, \text{ and } \alpha_n \in P_{A_n}, \]

\[ \text{then } F_i(\alpha_1, \alpha_2, \ldots, \alpha_n) \in P_B. \]

\( F_i(\alpha_1, \alpha_2, \ldots, \alpha_n) \) is a well-formed (surface) string of the category \( B \). The output of a PS rule, on the other hand,
is not in general a well-formed surface string; except when a lexical entry is introduced, the output is a sequence of category labels. In a sense, a MG syntactic rule of the above sort resembles what is sometimes called a local transformation, where B ≠ t, although such resemblance does not go far because the output of a MG syntactic rule (of PTQ for instance) is a linear string while a transformational output is a structure representable as a labelled bracketed string or a tree diagram. While I am not sure such recursive specification of well-formed strings of each category, as opposed to the special status accorded a sentence in generative grammars, is necessary at all, the bottom-up orientation in MG, coupled with semantic compositionality, seems to go most naturally with it. A natural extension, then, of MG syntax toward providing labelled bracketings would be to further require that each output of a syntactic rule be a well-formed string with labelled bracketings for any specified syntactic category. This is tantamount to viewing all the syntactic rules as transformations that operate on structures, only that some are local, others non-local.

Consider for instance PTQ S10, which is reproduced below as (9).

9) If δ ∈ P_{IV/IV} and β ∈ P_{IV}, then F_{7}(δ, β) ∈ P_{IV},
where F_{7}(δ, β) = β δ.
This is a rule that generates, for instance, from the two sample arguments below to the left of the colon, the output to its right.

10) slowly, walk: walk slowly.

I propose that a rule of syntax generate instead of (10) the following, where again expressions flanking the colon are arguments and value.

11) \([\text{slowly}]_{IV/IV}, [\text{walk}]_{IV}: [[\text{walk}]_{IV} [\text{slowly}]_{IV/IV}]_{IV}\).

Thus the output of a syntactic rule specifies a well-formed structured string of a given category. The output of (11) is equivalent to the following tree:

12)

```
      IV
     /   \
   IV    IV/IV
 /     /  |
walk  slowly
```

Standard transformations may be viewed as those rules whose input and output are both structured strings of the category sentence (designated here as \(t\)). The part played by PS rules in a transformational grammar is now, so to speak, played by
local transformations. Since all rules are structure-to-
structure conversion, the rule type of our grammar may be
called structural (assignment) rules.

To illustrate with one more example, consider the PTQ
rule S14 (see (4)), which, for instance, generates the expres­
sion to the right of the colon as value from the argument
expressions to its left.

13) Tom, he₂ thinks that Mary loves he₂: Tom thinks that Mary
loves him.

Taking this rule to be a structural assignment rule would
yield the following instead of (13).

14) [Tom]ₜ, [[he₂]ₜ [thinks that Mary loves [he₂]ₜ]ₜ]ₜ:


The expression to the right of the colon is thus the value of
the operation in the structural rule version of S14. The out­
put is equivalent to the following tree diagram:
While PS rules work together to define a sentence, any expression of the category t is enough to define the labelled bracketings of a sentence in this kind of rule simply because each expression of any category whatsoever is a string with structural information indicated by means of labelled bracketings. Thus in representing the structure (15) above, it is not necessary to refer to the argument expressions to the left of the colon in (14).

In summary, we take every syntactic rule that appears in our syntactic part of the grammar of Japanese to be a structural assignment rule, i.e., each operation that appears in a rule has labelled bracketed strings as inputs and output. In this sense, every syntactic operation is a transformational operation. 8 We will begin the actual presentation of these rules in section 3 of the following chapter after a discussion in the next section of some structural properties that we wish our Japanese sentences to have in order for grammatical
transformations to apply successfully.

3. **Basic Japanese sentence structures.**

3.0. **On the matter of case particles.**

Japanese expresses basic grammatical relations like subject, object, etc. by means of postpositional particles attached to NPs, and though I agree with Tonoike (1979: 1) that an analysis of a certain construction "is a failure if it cannot predict the surface distribution of the case particles however elegant and successful its account of other aspects of the construction may be," we will not address ourselves to the question as to how case particles may be derived or predicted in this study. Nonetheless a word or two may be in order here as to what approach to this problem is more consistent with our framework of inquiry than other possible alternatives. Since the issue in fact is very complex, the following is anything but definitive. For an excellent study on this issue as well as examination of various possible approaches, the reader is referred to Tonoike (1979).

Where simple sentences are concerned, particle choice of subject, direct object, and indirect object of verbs,
adjectives, and nominal adjectives\(^\text{10}\) is determined according to the following lexically determined categories, which are for convenience designated by the numbers 1 through 7. (The table, except for minor details, is borrowed from Tonoike (1979: 54).)

<table>
<thead>
<tr>
<th>Syntactic category</th>
<th>No.</th>
<th>S</th>
<th>DO</th>
<th>IO</th>
<th>V</th>
<th>A</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intransitive</td>
<td>1</td>
<td>ga</td>
<td>x</td>
<td>x</td>
<td>aruku &quot;walk&quot;</td>
<td>akai &quot;red&quot;</td>
<td>kiree da &quot;pretty&quot;</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>ga</td>
<td>o</td>
<td>x</td>
<td>yomi &quot;read&quot;</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>ga</td>
<td>ga</td>
<td>x</td>
<td>*</td>
<td>umai &quot;good at&quot;</td>
<td>heta da &quot;bad at&quot;</td>
</tr>
<tr>
<td>Transitive</td>
<td>4</td>
<td>ga</td>
<td>o/(ga)</td>
<td>x</td>
<td>hosii &quot;want&quot;</td>
<td>suki da &quot;fond of&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>ni/(ga)</td>
<td>ga</td>
<td>x</td>
<td>mieru &quot;visible&quot;</td>
<td>kowai &quot;afraid&quot;</td>
<td>hituyoo da &quot;necessary&quot;</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>ga</td>
<td>ni</td>
<td>x</td>
<td>su &quot;meet&quot;</td>
<td>hitosii &quot;equal&quot;</td>
<td>humuki da &quot;unfit&quot;</td>
</tr>
<tr>
<td>Di-transitive</td>
<td>7</td>
<td>ga</td>
<td>o</td>
<td>ni</td>
<td>ataru &quot;give&quot;</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

(The cross "x" indicates the grammatical relation in question is not applicable; the asterisk "*" indicates absence of any
lexical item in question that takes on the indicated particles. The parenthesized particle is an alternative form to the more basic particle that appears to the left of the slash "/". Thus verbals must be marked as to which particle-choice category they belong to; aruku "walk" for instance would be [+1], yomu "read" would be [+2], etc. Obvious syntactic and semantic subregularities that govern the choice of particles must be reflected somehow somewhere in the grammar, but for our purpose, we may take each lexical item to have a necessary and sufficient information as to the particle choice. The optional and less basic particles in the parentheses can then be predicted by optional transformations, based on the more basic particle choice as indicated by numbers 4 and 5.

Similarly I assume that every verbal that takes a complement construction each contains information as to what particles to be assigned to subject, object, complement, etc. But there is one important respect in which our approach significantly differs from the standard generative treatment. As will be made clear in Chapter V, our grammar does not have any obligatory application of Equi-NP Deletion or Verb Raising. Rather a complex verbal expression like causatives is directly derived by attaching a suffixal causative verb to a lexical verb in order to maintain the well-formedness of any specified category as discussed in section 2 above, backed by precise semantic characterizations of such a process. Hence, in our
approach, the causativized verb itself may be regarded as a new lexical item capable of its own particle choice. Though there is a certain mutual influence between the particle choice pattern of a pre-compounded verb and that of a verbal suffix\textsuperscript{12}, the basic principle that we hold is that the compounded verb as a whole determines the particle choice as if it were a simple lexical verb as in (16). Thus we take it that verbal suffixes are also appropriately categorized according to their particle choice and their interaction with that of the presuffixed verb or adjective.

The whole picture that we envision as to the particle choice (of the basic particles) may then be regarded as lexical; each lexical item, whether basic or derived, determines the appropriate choice of particles according to some pre-determined principle of distribution like (16). Transformations may only optionally change a basic particle so determined to another less basic particle\textsuperscript{13}.

Since certain transformations like Q-float\textsuperscript{14} are sensitive to particular case particles, it is quite likely that our formation rules S2, S3, S4, etc. must directly specify appropriate particles according to the particle-choice class of the verb. But rather than do this, we will just assume some particle specification according to the principle outlined above in our presentation of rules and
use a hyphen "-" as a cover-all particle in the position case particles appear unless a unique case particle is structurally predicted to occur in such a position, in which case it is overtly specified (cf. S23). In this respect we depart from our requirement that every expression of any specified category be a well-formed surface string along with the inclusion of grammatical morphemes like Present, Past and some lexical features in such a string.15

3.1. Flat vs. hierarchical.

Given a Japanese sentence like:

17) Hanako-ga Taroo-o nagutta
    Hanako Taroo hit
    "Hanako hit Taroo."

positions differ as to how this is to be structurally analyzed; disregarding the problems of particles and tense, some grammarians have it that it is to have a hierarchical structure like (a) below while others maintain a flat structure like (b).16
Each analysis has its own claims: (a) maintains that relational properties like subject-of, object-of, etc. are predictable, hence not essential, properties of a hierarchical categorial analysis, that basic grammatical particles like $ga$, $o$, etc. are completely predictable, given (a), that these particles do not make any semantic contribution, suggesting the preferability of their transformational introduction, and that the intermediate node VP plays a crucial role in the statement of certain syntactic rules; (b) on the other hand maintains that a hierarchical structure like (a) is anything but necessary in the syntactic description of Japanese, there being hardly any motivation for a node like VP, that relational
properties like subject-of, object-of, etc. are either primitive syntactic notions or else derivative but definable by means other than a hierarchical structure, and that grammatical particles like *ga*, *o*, etc. are not completely predictable from a structure like (a).\(^{19}\) Borrowing the terminology from language typology\(^{20}\), the issue here is basically this: is Japanese a configurational language (a)? or is it a nonconfigurational language (b)? It is not my intention to explore this problem in this dissertation, the issue being in need of extensive research. Rather, in view of what is to be said in the next section, I wish to make it clear that we are taking Japanese to be a flat, or nonconfigurational, language, whose basic sentence structure is therefore something like (b). The ultimate reason for such choice as of now resides in my gut-feeling about the structure of Japanese though I could perhaps adorn this with syntactic arguments of the usual sort.\(^{21}\)

3.2. Grammatical relations.

Perlmutter and Postal\(^{22}\) proposed an important new type of grammatical theory that later came to be called Relational Grammar (hereafter RG). While details of analyses\(^{23}\) may differ, the fundamental tenet of RG upheld by grammarians within this framework seems to have universal appeal:
19) ... grammatical relations such as 'subject of' and 'direct object of' play a central role in the syntax of natural languages, i.e. they are the proper units for the description of many aspects of clause structure at various derivational levels and figure directly in the statement of numerous grammatical rules and universal principles which govern the structure and organization of the syntax of natural languages. Relational Grammar posits these grammatical relations as primitives in linguistic theory. (Johnson (1977: 153))

In terms of intra- and cross-language generalizations a possible (syntactic) grammar might achieve, RG stands out par excellence above the rest in its ability to provide them in a non ad hoc way; to name just a few, the universal characterization of several advancement rules, the notion of retirement (i.e., chômage and emeritus-hood), the dichotomy into terms and non-terms, the NP accessibility hierarchy, etc. For our transformational grammar, too, we would like to incorporate a version of RG since the basic tenet of RG quoted above proves equally useful in the syntactic description of Japanese, as will be clear in later analyses to be presented. Actually the notions like subject-of, object-of, etc. are already implicitly present in MG. This should become clear from the consideration of rules of syntax in
MG. Thus, those terms that get combined with intransitive verbs or verb phrases (IV) are subjects, while those that combine with transitive verbs or verb phrases (TV) are direct objects. The extension to 3-place verbs or verb phrases is obvious enough, the terms that get combined with them being indirect objects. Dowty (1978a: 113-4), reproduced below with minor simplification, is perhaps useful for grasping the idea.

20) \[ T = \text{noun phrases (or terms)} \]
\[ \text{IV} = \text{intransitive verb (phrase) (corresponds to VP)} \]
\[ \text{TV} = \text{transitive verb (phrase)} \]
\[ \text{TV} / \text{T} = \text{three-place verb (phrase)} \]

(continued on the following page)
Verb-Indirect Object Rule: $TV/T + T \rightarrow TV$

Mary walks

Mary $[\text{walk}]_{IV}$
(ii) Mary dates John

```
  Mary
     [date John]_{IV}
       [date]_{TV}  John
```

(iii) Mary gives a book to John

```
  Mary
     [give a book to John]_{IV}
       [give to John]_{TV}  a book
         [give]_{TV//T}  John
```

It appears then that should the need arise, we ought to be able to use, in principle at least, such implicitly present relational notions more directly in our grammar. Note that RG takes relational notions like subject-of, etc. as primitive, but it is obvious that they are intended to be syntactic primitives. Thus throughout the syntax, the direct object-of, for instance, receives the same syntactic treatment in the following pair. (Hereafter, 1, 2, 3 represent subject-of, direct object-of, indirect object-of respectively, according to the standard practice; I will also use the convention of placing the accent circonflexe
"^" above such numerals when they are en chômage, i.e.,
downgraded.)

21) a. John gives a book to Mary

\[ \begin{array}{c}
1 \\
2 \\
3 \\
\end{array} \]

b. John gives Mary a book

\[ \begin{array}{c}
1 \\
2 \\
\end{array} \]

In each sentence of this pair, 2 counts as the same syntactic
relation, namely, the direct object-of; hence it is possible
to promote them to 1 (passivization) to derive sentences like:

22) a. a book is given to Mary by John

\[ \begin{array}{c}
1 \\
3 \\
\end{array} \]

b. Mary is given a book by John

\[ \begin{array}{c}
1 \\
2 \\
\end{array} \]

When we turn to the semantics, though, we cannot treat each
occurrence of 2 in (21) (a) and (b) similarly; they must be
differently interpreted: thus Mary is an expression that
semantically gets combined with give while a book combines with give to Mary. Otherwise we cannot guarantee the synonymy of (a) and (b). It appears that if we wish to have a unique semantic interpretation assigned to both (a) and (b) in (21) based on RG grammatical relations, we must, as it were, distinguish between semantic and syntactic grammatical relations (unless we are ready to maintain à la Dowty (1978a) that each occurrence of gives in (a) and (b) of (21) is of a different syntactic category). Such a distinction I think it is possible to maintain, given the way syntax and semantics are related in MG. More specifically, there seems to be a place in MG where syntactic and semantic relations appear in one-to-one correspondence, that is, the MG syntactic rules that combine verbs or verb phrases with terms (see (20)).

3.3. Representation of basic Japanese sentence structures.

Disregarding the problems of particles and verb morphology, we regard the basic structures of sentences like (a) and (b) below to be (a') and (b''), respectively, although the actual presentation of syntactic rules and their translations are deferred to the next chapter.
23) a. **Taroo-ga odoru**

Taroo dance
"Taroo dances."

b. **Hanako-ga Taroo-o tataku**

Hanako Taroo slap
"Hanako slaps Taroo."

While I am using relational labels like 1 and 2, I am here departing from the usual convention of RG in at least two respects in adopting representations like (23). First,
although RG usually assumes that the underlying structures are unordered, subject to late linearization rules, we are starting, as it were, with the ordered strings since our assumption is that every expression of the category t (i.e., a sentence), or, for that matter, of any category, is well-formed. Since Japanese has a rule of scrambling giving a high degree of freedom of order to sister constituents of the main verb, the order prior to this scrambling as appears in (b') and the like may be regarded as the basic word order of Japanese. Second, although notions represented by 1 and 2 are relational in nature, we are using them here as category labels. This I believe is simply a matter of technicality; we could for instance replace the node 1 above by, say, GT (Grammatical Term) or NP and assign the feature [+subject] to it. What is important is that we be able to obtain the information that the expressions dominated by 1 above function as the subject of the sentence. And this, as we have indicated above, can be done in a systematic manner within MG.

4. Summary.

After pointing out the desirability of labelled bracketings even within the PTQ syntax of English in section
1, we proposed in section 2 that our well-formed expressions of Japanese of any specified category be made up of labelled bracketed strings, leaving the actual presentation of rules to the next chapter. Then in section 3, we expressed our particular view as to how Japanese sentences are to be represented. We first outlined briefly our position as to case particles (3.0), and then sketched two opposing views as to the structure of basic Japanese sentences - flat and hierarchical structures (3.1), together with the indication that we opt for flat representations. In section 3.2 we expressed our view that grammatical relations be directly reflected in the structural representation of Japanese sentences, favoring the views expressed by Relational Grammar. Then in section 3.3 sample illustrations were given of a flat, nonconfigurational structure with the indication of grammatical relations as syntactic primitives.
Footnotes to Chapter II

1In addition to the rules S4 and S14 mentioned below; S15 and S16 are transformation-like because of the substitution. And so is S3 that forms a relative clause structure in the form $CN \text{ such that } S$. The various operations in S17 are also transformation-like, and they all potentially possess the danger alluded to with respect to S4 in the text.

2Partee (1976: footnote 31) credits the observation to Michael Bennett.

3This of course does not mean that this is the only way for coping with the problem. Bennett (1975), for instance, uses the "flagging" method often employed in computational programming.

4Since the reflexive is not taken care of in PTQ, this is the form that gets produced. When the reflexive is supplied, the form is:

*Every park attendant loves itself,

which is still ungrammatical in the intended reading where the park attendant is in love with himself. The inadequacy of the treatment of reflexives in Montague's original
grammars, arising from his disinterest "because of the rather uninteresting complications (in syntax/TS) that would be involved (EFL, p.198)," was first remedied by Bennett (1975), where he again uses a "flagging" method by marking every object pronoun with a special symbol "*" (for instance, *him₀ as opposed to him₀).

5Partee (1979), for instance, has, associated with each syntactic rule, a property specification rule, which, among others, serves to determine the gender of the noun phrase. Cf. also Karttunen's remark, quoted in Partee (1979: footnote 12), that "it is likely that English gender should not be treated in the syntax at all." Cooper (1975) develops a detailed system of gender, where it is regarded that gender is to be treated in the semantics.

6Postal (1964), who examines quite a variety of proposed models of modern grammatical description, gives, based on Chomsky (1975), the following two conditions on the rewriting system in order for it to count as a phrase structure grammar:

Condition (1) If U → W, then W is at least as long as U, that is, contains at least as many symbols.
Condition (2) If $U \rightarrow W$, then:

a. $U = XAY$ and $W = XZY$

b. $Z$ is not null, that is, it is not the identity element $I$ (This of course follows directly from Condition (1) but is repeated here for ease of reference.).

c. $Z$ is not identical to $A$.

7This has certain important consequences on possible rules in the syntax. In particular, rule ordering and obligatory rule application must not be allowed in the syntax since these in effect convert or have the effect of converting impossible surface strings to possible or less abstract surface strings. Since these are better avoided in order to constrain the possible grammatical analyses, other things being equal, any grammar that possesses these features must be considered less desirable than the ones without such features. The well-formedness requirement may thus be understood as part of constraints on possible grammars. The prime cases of rule ordering involving Reflexivization and Passivization and obligatory rule application of Equi-NP Deletion and Verb Raising will be discussed in Chapter V, where it will be shown that neither rule ordering nor obligatory rule application involving these rules will be necessary, given our reanalyses of these constructions.
It must, however, be pointed out that such a well-formedness requirement presupposes a distinction between syntactic rules and morphological rules though the demarcation between the two types of rules is not always easy to draw. But I believe such distinction is a useful one, and our "well-formed" expressions of any specified category may accordingly contain grammatical morphemes like Past or Present or a feature bundle having to do with gender and number in determining the actual pronominal forms of various bound pronouns or other morphological units. Needless to say, morphophonemic alternation is not expressed in the syntactic rules, either. Recall that even in PTQ syntax, there are many expressions of a specified category that are not well-formed surface strings, that is, subscripted pronouns.

Part of the ideas expressed in this section appeared in Sugimoto (1979). The sense in which every syntactic operation is a transformational operation has to be qualified by the observation that while a standard transformational rule takes as input a single constituent (i.e., strings of words or grammatical formatives dominated by a single node, which is usually designated by the symbol "S"), our structural assignment rules may take one or more arguments, each of which is a labelled-bracketed string. In this sense, the comparison should be made to transformations in the pre-Aspects period, when we had both singulary and generalized transformations.
Partee (1979) uses rules of a kind similar to ours with some constraints although it will become clear later that our rules will have slightly different properties from hers due to the consideration to be given in the next section.

9 For an illustration of actual particles and their major functions, see footnote 1 to Chapter III.

10 Again see footnote 1 to the next chapter about our position of these verbal categories as well as illustrations of their lexical representations.

11 For the purpose of this dissertation, we assume that the particles in parentheses are less basic than the ones to the left of the slash. Although there is not much evidence that justifies this assumption, there are two points worth noting about this: 1) native speakers of Japanese generally agree that our "basic" particles sound more natural than "non-basic" ones in a given sentence, and 2) the dative subject (that is, ni-marked subject in Class 5 of (16)), for instance, is not a phenomenon peculiar to Japanese but widespread across languages like Latin, Russian, German, Korean, etc. (Cf. Shibatani (1978: 358-361)). Nothing that is said below in this dissertation crucially depends on this assumption of ours; hence the assumption may be regarded as merely a matter of convenience.
For instance, *hanasu* "speak", which is of the particle choice class 2 in the classification (16), as in:

i) Taroo-ga eigo-o hanasu

Taroo English speak

"Taroo speaks English."

when suffixed by -reru "can" shows the following variety.

ii) Taroo-ga eigo-o hanas-eru

iii) Taroo-ni eigo-ga hanas-eru

iv) Taroo-ga eigo-ga hanas-eru

v) ?Taroo-ga eigo-o hanas-eru

"Taroo can speak English."

(v) sounds much better in a sentence like the following:

vi) Taroo-ni eigo-o hans-eru to-wa sir-anakatta

Taroo English speak-can comp.-topic know-did not

"(I) did not know Taroo can speak English."

Clearly -reru "can" suffixed compound may choose particles according to the original pattern of the verb (*hanasu* "speak") or the new pattern influenced by -reru, which is of Class 5 in the classification (16).
But it is a moot point whether transformations directly change the particles, as many standard approaches seem to assume, or they effect certain structural changes so that particles may be predicted according to structural configuration or grammatical relations, as Tonoike (1979) proposes.

See section 3, Chapter IV.

Cf. footnote 6 above.

In generative grammatical tradition I believe it was Kuroda (1965) that first proposed a hierarchical analysis like (18a). As for (18b), I am not sure who was the first to propose such a structure for Japanese among generative grammarians although there is no doubt that Fillmore (1968) had a great influence for choosing such flat structures. As is well known, Mikami (1972) vehemently opposed the analysis (18a), based on the uselessness of the notion subject in the grammar of Japanese. Although Shibatani (1978) maintains (18b), he gives criticism of Mikami's argumentation against (18a) (pp.194ff.).

See Kuroda (1965: Chapter VI).

See, for instance, Nakau (1973: Chapter II).
For bits and pieces of arguments of this type, see Shibatani (1978: Chapters I and IV) and Mikami (1972: Chapter II).

According to Chomsky (1980: 40), the terminology is due to Kenneth Hale.

See footnote 19 above.

That is, the lecture given at the LSA Institute, summer, 1974. My only source for this is Perlmutter and Postal (1974), which is an unofficial, but widely circulated, compilation of the notes on Relational Grammar by Clay Swinburn.

See, for instance, Johnson (1974), Cole and Sadock (1977), Perlmutter (1980), etc. In their recent publication, which is an outgrowth of RG, Johnson and Postal (1981) call the grammar an "arc pair grammar".

Cf. footnote 7 on syntax and morphology.

See Kuno (1973: Chapter I) for some basic syntactic characteristics of Japanese.

Partee (1979) is a variation of this approach.
CHAPTER III

PREDICATE NOMINALS

0. Introduction.¹

It appears that the verb-final pressure of Japanese makes the predicate nominal construction a kind of a "refuse dump" in syntax, giving rise to a variety of semantic combinations of subjects and predicates, the unraveling of which, it appears, is mostly a matter of contexts and common knowledge. It is thus to be borne in mind that our analyses will be touching on the tip of a huge iceberg mostly submerged below the dark sea of pragmatics. In section 1 we classify predicate nominal constructions into several sub-types and note those to be discussed. The next section (2) is an initial examination of first such sub-type. In section 3 we give basic rules of Japanese sentence formation, as promised in the preceding chapter, together with their translation rules, followed by a brief discussion on some of the rules and their alternatives. Then in section 4 we pick up where we left off in section 2 and continue the discussion of the construction in question. Then we go on to examining the second sub-type (5), followed by a discussion of related issues (6.0-3) and a summary (7).
1. **Predicate nominal constructions.**

Predicate nominal constructions are those that are made up of a subject followed by a noun followed directly by a copula.² The most notable syntactic characteristic is the absence of any grammatical particle after the predicate nominal. Normally a sister constituent of the predicate verb must be followed by some grammatical particle³ unless it is an adverbial of certain types⁴:

1) a. Taroo-ga Hanako-o butta

    Taroo    Hanako    slapped

    "Taroo slapped Hanako."

b. *Taroo Hanako-o butta

c. *Taroo-ga Hanako butta

d. *Taroo Hanako butta

e. kinoo    Taroo-ga Hanako-o butta

    yesterday

f. Taroo-ga Hanako-o wazato    butta

    on purpose

By this criterion, sentences like the following, which contain apparent instances of a predicate nominal, do not constitute predicate nominal constructions.
2) a. Hanako-ga kasyu-o yameta  
   Hanako singer quit  
   "Hanako quit (being) a singer."

b. Hanako-ga bengosi-o akirameta  
   Hanako lawyer gave up  
   "Hanako gave up on becoming a lawyer."

(2a), for instance, appears to contain the o-marked predicate nominal kasyu "singer". That this semantically functions as a predicate nominal in this sentence may be seen from the validity of the following as conclusion from the premise (2a).  

3) Hanako-ga kasyu deatta  
   Hanako singer was  
   "Hanako was a singer."

It could be that a sentence like (2a) is a transform of another well-formed sentence like:

4) Hanako-ga [kasyu dearu]ₜ-koto-o yameta  
   Hanako [singer is]ₜ-comp.-o quit  
   (Approx.) "Hanako quit (her) being a singer."

although I am not sure what conditions have to be met for a transformation to apply to (4) to produce (2a). The bizarre-ness of (5a) may, then, be attributable to that of (5b).
5) a. Hanako-ga ano kasyu-o yameta  
   Hanako that singer quit  
   "Hanako quit (being) that singer."

   b. Hanako-ga ano kasyu deatta  
   Hanako that singer was  

Unless (5b), which is a sentence of predicate nominal construction, is interpreted to be a statement of identity, the sentence sounds very strange, and this may be the basis, given an analysis like (4), for the strangeness of (5a).

In spite of these observations, we do not consider sentences like (2) to be examples of predicate nominal constructions simply because the nominal in question (kasyu "singer" in (2a) and bengosi "lawyer" in (2b)) is marked by a grammatical particle and trivially because the verb is not a copula; hence these are excluded from discussion.6

In addition to types like (2), where we have apparent predicate nominals in non-subject position, we also have a sentence like the following.

6) inu-wa kore da  
   dog this is  
   "Dog, this is." or "This is a dog."

(6) bears close resemblance to the sentence:
7) kore-wa inu da  
this dog is  
"This is a dog."

This type of sentences will be discussed in section 6.0 below.

Returning now to the first sentence of this section, predicate nominal constructions are those that are made up of a subject followed by a noun followed directly by a copula, and they may be divided into at least the following four sub-types.

8) i. identity statements  
   a. Taroo-ga Hanako dearu  
      Taroo Hanako is  
      "Taroo is Hanako."
   b. kono hito-ga Ziroo dearu  
      this person Ziroo is  
      "This person is Ziroo."

   ii. inclusion statements  
      a. Hanako-ga kasyu dearu  
         Hanako singer is  
         "Hanako is a singer."
b. Taroo-ga gakusei dearu
   Taroo student is
   "Taroo is a student."

iii. whereabouts statements

a. Hanako-wa daidokoro dearu
   Hanako kitchen is
   "Hanako is *(in) the kitchen."

b. Taroo-wa Tookyoo dearu
   Taroo Tokyo is
   "Taroo is *(in) Tokyo."

iv. "I am a fish" statements

boku-wa sakana da
I fish is
(lit.) "I am a fish."
"I'll eat fish."
"I'll play (the role of) a fish."
"I hate fish."

Of these we will take up only (i) and (ii); (iii) may be analyzed as a construction that involves a different verb dearu "is" that semantically corresponds to, say, -ni iru "is in" while (iv) may be best analyzed as part of a question-answer pair although I am not sure what formal
mechanism might be brought in to effect such an analysis. \(^{10}\)
(8i) is a case where we have a proper noun or its equivalent in the predicate nominal position while common nouns appear in this position in (ii). (8i) will be discussed in the next section, while we take up (8ii) in section 5 with a discussion of its further sub-types in section 6.

2. *Predicate nominal* Ts.

Following Bennett (1975), we take the denotation of proper nouns (PNs) to be the set of properties\(^{11}\) possessed by the individual named by such PNs. Thus *Taroo* and *Hanako*, in intensional logic syntax, will be translated as:

\[
\lambda \mathbf{E} \mathbf{P}(\alpha) \quad \text{where } \alpha = t \text{ or } h.
\]

Since any expression whose denotation is a set of properties of an individual, i.e., of the semantic type \(<s,<e,t>,t>\), is called a Term (T), we will take as the distinguishing characteristic of (8i) the fact that a PN or its equivalent appears in the predicate nominal position, and accordingly call such a noun as a predicate nominal T. Ts most closely correspond to NPs in linguistics. In the analysis of English, furthermore, Ts in MG correspond, in part, to grammatical terms in RG, though this correspondence is not
so straightforward in Japanese because of grammatical particles. But where there is no danger of ambiguity, I will use T as a cover term for Relational as well as Montague grammatical terms in syntax. Such ambiguity is completely resolved in the actual presentation of rules where T is uniquely defined.

Identity statements like (8ia) (repeated as (a) below) or (10b):

10) a. Taroo-ga Hanako dearu
   Taroo Hanako is
   "Taroo is Hanako."

   b. Taroo-ga Ziroo dearu
   Taroo Ziroo is
   "Taroo is Ziroo."

mean (11) (a), (b) respectively, and not (c), (d).12

11) a. t = h
    b. t = z
    c. ^λP^vP(t) = ^λP^vP(h)
    d. ^λP^vP(t) = ^λP^vP(z).

(11) (a,b) are statements of extensional identity while (c), (d) are much stronger statements of intensional
identity. Note that since the set of properties a certain individual has must be unique at any given index, (c) and (d) in effect are saying that individual identity holds across indices. Consideration of more normal circumstances under which identity statements involving PNs (proper nouns) appear will make this even clearer. Even after learning the fact that Cathleen Collins also goes by the name Bo Derek, the conclusion reached below (ii) from the premises (i) is unwarranted. 13

12) i. a. Ziroo-wa Boo-ga bizin-da to omou

\[
\begin{array}{ccc}
\text{Ziroo} & \text{Bo} & \text{beautiful comp. think} \\
\end{array}
\]

"Ziroo thinks Bo is beautiful."

b. Boo-ga Kyasarin da

\[
\begin{array}{ccc}
\text{Bo} & \text{Cathleen is} \\
\end{array}
\]

"Bo is Cathleen."

ii. Ziroo-wa Kyasarin-ga bizin-da to omou

\[
\begin{array}{ccc}
\text{Ziroo} & \text{Cathleen} & \text{beautiful comp. think} \\
\end{array}
\]

"Ziroo thinks Cathleen is beautiful."

This is so because even though the two propositions Boo-ga bizin-da "Bo is beautiful." and Kyasarin-ga bizin-da "Cathleen is beautiful." may be synonymous in our own world because of the proposition Boo-ga Kyasarin da "Bo is Cathleen.", they may well differ from world to world according to the validity of the last proposition in a given world.
But this is tantamount to saying that (12ib) is an extensional identity. Since considerations of other kinds favor the analysis (9) for PNs, we are thus led to the task of 1) producing sentences like (10), and 2) giving them translations like (11) (a), (b), which will be done in the next section.

Although we have not considered derived Ts (see Chapter IV below), it might be well to point out here that unless some constraints are placed on predicate nominal Ts, our grammar will produce sentences like:

13) a. Hanako-ga subete-no gakusei dearu
   Hanako every student is
   "Hanako is every student."

b. Taroo-ga subete-no otoko dearu
   Taroo every man is
   "Taroo is every man."

These and others of the same sort sound all odd, and I have a hard time imagining what kind of situation these describe if they are true (outside of their metaphorical senses). Probably, what is involved is not some kind of constraint on predicate nominal Ts but our conception of ordinary world, for note that a sentence like the following seems to make much more sense (well, at least to me).
14) **kami-ga subete-no ningen dearu si subete-no ningen-ga**

God every human is and every human

kami dearu

God is

"God is every man, and every man is God."

One of God's attributes being omnipresence, (14) seems readily interpretable (in our head, that is). We cannot simply declare that predicate nominal Ts be limited to basic, non-derived Ts, for sentences like the following abound in the language (though demonstratives are not treated in our fragment).

15) a. **kore-ga sono otoko dearu**

this that man is

"This is the man (I mentioned about, etc.)."

b. **Hanako-ga sono gakusei dearu**

Hanako that student is

"Hanako is the student (you mentioned about, etc.)."

The status of sentences like (13) thus remains open though our syntax is going to generate them with their corresponding interpretations.
Here we give basic syntactic rules and their corresponding translations. The syntactic rules are given in such a way that they reflect the discussion of section 3 in the preceding chapter; that is, sentences have flat structures with relational categories assigned.

The basic lexicon (to be either augmented or revised as we go along) of category A, $B_A$, is given by simply listing lexical items of this category. Where there is no member, we simply write $\lambda$. The set of basic sentences $B_T$, for instance, is null, there being no such thing as a basic sentence not amenable to further syntactic decomposition.\(^{19}\)

16) Basic Lexicon

$B_T = \{[\text{Taroo}]_T, [\text{Hanako}]_T, [\text{Boo}]_T, [\text{Kyasarin}]_T\}$

("Taroo", "Hanako", "Bo", "Cathleen")

$B_{IV} = \{[\text{hasiru}]_V, [\text{aruku}]_V, [\text{sinu}]_V\}$

("run", "walk", "die")

$B_{TV} = \{[\text{butu}]_V, [\text{korosu}]_V, [\text{keru}]_V\}$

("slap", "kill", "kick")

$B_{TTV} = \{[\text{syookaisuru}]_V\}$

("introduce")
17) Syntactic Rules (After each rule number is added a mnemonic name in parentheses.)

S1. (Lexicon)

\[ B_A \subseteq P_A \] for every category \( A \).

S2. (Subject-Verb)

If \( \alpha \in P_T, \beta \in P_{IV} \), then \( F_1(\alpha, \beta) \in P_t \), where

\[ F_1(\alpha, \beta) = [[\alpha -]_1 \gamma]_t \], where \( \beta = [\gamma]_{IV} \).

S3. (DO-Verb)

If \( \alpha \in P_T, \beta \in P_{TV} \), then \( F_2(\alpha, \beta) \in P_{IV} \), where

\[ F_2(\alpha, \beta) = [[\alpha -]_2 \gamma]_{IV} \], where \( \beta = [\gamma]_{TV} \).

S4. (IO-Verb)

If \( \alpha \in P_T, \beta \in P_{TTV} \), then \( F_3(\alpha, \beta) \in P_{TV} \), where

\[ F_3(\alpha, \beta) = [[\alpha -]_3 \gamma]_{TV} \], where \( \beta = [\gamma]_{TTV} \).

S5. (Predicate nominal T)

If \( \alpha \in P_T \), then \( F_4(\alpha) \in P_{IV} \), where

\[ F_4(\alpha) = [\alpha[daC]_{IV} \]

18) Translation Rules

T1. \([Taroo]_T, [Hanako]_T, [Boo]_T, [Kyasarir]_T\) translate as \( \lambda P^aP(\alpha) \) where \( a = t, h, b, k \).

(Unless specifically stipulated in this manner, every basic lexical item is translated as a non-logical constant of a specific semantic type \( 21 \), which is given, as usual in MG, by priming the syntactic expression:

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thus, \([\text{hasiru}]_{IIV}\) translates as \text{hasiru}' "run", \\
\([\text{sinu}]_{IV}\) as \text{sinu}' "die", etc.)

T2. If \(\alpha \in \mathcal{P}_T, \beta \in \mathcal{P}_{IV}\), and \(\alpha, \beta\) translate as \(\alpha', \beta'\) respectively, then \(F_1(\alpha, \beta)\) translates as \(\alpha'(\beta')\).

T3. If \(\alpha \in \mathcal{P}_T, \beta \in \mathcal{P}_{TV}\), and \(\alpha, \beta\) translate as \(\alpha', \beta'\) respectively, then \(F_2(\alpha, \beta)\) translates as \(\beta'(\alpha')\).

T4. If \(\alpha \in \mathcal{P}_T, \beta \in \mathcal{P}_{TV}\), and \(\alpha, \beta\) translate as \(\alpha', \beta'\) respectively, then \(F_3(\alpha, \beta)\) translates as \(\beta'(\alpha')\).

T5. If \(\alpha \in \mathcal{P}_T\), and \(\alpha\) translates as \(\alpha'\), then \(F_4(\alpha)\) translates as \(\lambda \alpha \lambda x \{\lambda y [x = y](\alpha')\} \lambda\).

Let me show how our syntactic rules work by way of illustrating the generation of sample sentences.22

19) **Taroo-ga Hanako-o butu**

Taroo  Hanako  slap

"Taroo slaps Hanako."

\[
\text{[[[Taroo]}_{T} - 1] [[\text{Hanako}]}_{T} - 2 [\text{butu}]_{IV} : S2
\]

\[
\text{[[[Hanako]}_{T} - 2 [\text{butu}]_{IV} : S3
\]

\[
\text{[Taroo]}_{T} \quad \text{[[[Hanako]}_{T} - 2 [\text{butu}]_{IV} : S3
\]

20) **Taroo-ga aruku**

Taroo  walk

"Taroo walks."

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21) Taroo-ga Hanako-o Boo-ni syookaisuru
   "Taroo introduces Hanako to Bo."

The top line of each analysis tree above is equivalent to tree diagrams (22), (23), (24) respectively:
One look at our lexicon and syntactic rules raises a couple of issues. First, note that verb entries are all doubly bracketed. This in fact is not necessary, and we could, for instance, replace $B_{TTV}$ by the following.

25) $B_{TTV} = \{syookaisuru\}_V$

The only reason I have not done so is that I would like to avoid the issue of the correspondence between a syntactic category and a semantic type. Thus, if $syookaisuru$ is of
the syntactic category V, so would be the transitive butu "slap" and the intransitive hasiru "run". Since MG requires that any syntactic category correspond to only one semantic type, this relaxation is better avoided. Of course, so long as such relaxation is limited to the basic lexical level, it is possible, it seems to me, to reinterpret the lexical category label as somewhat equivalent to an instruction of a lexical insertion rule as envisioned in Chomsky (1965). So probably not much harm is done in assigning the lexical category label like V (or A or N) to what in fact is a set of lexical items of a variety of semantic types. My doubly bracketed lexical items simply avoid this issue by signalling the categoryhood of each expression by the outermost node label. Needless to say, the issue pertaining to such categories like V is still there, which I presume will be cleared by future study on lexical entries in MG.

Second, note that S5 introduces a lexical item in the output of F4. Such out-of-the-blue introduction, or more elegantly, syncategorematic introduction, of lexical items obviously has to be properly constrained. The issue somewhat resembles the problem of recoverability of deletion (see, for instance, Chomsky (1965)), viewed with a mirror. For the present dissertation, we assume that only structurally predictable constants may be introduced by our rules.
Third, note that rules S2, S3, S4, in combining with Ts, wipe out the outermost brackets (with labels) of verbal elements: in each case, $\gamma$ rather than $\beta$ combines with Ts. This, as the reader may have noticed, is then the key to obtaining flat structures for Japanese sentences. The operation itself, viewed from linguists' point, is a little weird: an operation that chops off the top node label from a structure! Since this operation appears consistently whenever verbal elements combine with grammatical terms as well as non-terms (in the sense of RG), this might be considered a language-particular subroutine in the syntax of Japanese. At the moment we will allow only the removal of outermost brackets.

It appears, from the observations made, that our structural rules, in addition to performing obvious operations like concatenation, may 1) introduce structurally predictable constants, 2) assign brackets to arguments as well as to values, and 3) wipe out the outermost brackets (of arguments, which, furthermore, are verbal expressions). Where these constraints will lead to is not clear at present, and we shall, in this dissertation, abide by these limitations.

One might argue that instead of the step-by-step process adopted in our grammar for obtaining flat struc-
tudes like (22) - (24), one could introduce them in one swoop. In fact this appears to be the tacit assumption of most grammarians who maintain flat structures even though I have not yet seen any presentation of rules for deriving these structures by these grammarians. Phrase structure rules like:

26) $S \rightarrow 1 ( 2 ( 3 ) ) V$

$n \rightarrow \text{NP P}$, where $n = 1, 2, 3$

for instance, can generate grammatical terms in one step, giving rise to the same kind of flat structures, the selection of 1, 1 2, or 1 2 3 being determined by the verb. Syntactically I feel this is an attractive approach, but I reject this on the following grounds. Note that this approach, other things being equal (to our grammar), will have no way of distinguishing the scope relation of grammatical terms involved. Particularly, given a sentence like:

27) `minna-ga dareka-o nagutta`

`everyone someone hit`

"Everyone hit someone."

the grammar presumably would have to assign two different interpretations to this sentence without being able to
specify how such readings might arise in a systematic way. As we will see in the next chapter, our step-by-step approach is free from this criticism. A further suggestion that one have only pronouns occurring in the structures created by (26) with late introduction of quantified terms in the manner of PTQ will not work, either. Such proposal, as Montague showed, works only when one is dealing with extensional contexts; it fails miserably when intensional contexts are considered. It seems to me that it is the lack of interest in or neglect of semantics that makes Japanese grammarians come to envision the direct generation of flat structures as exemplified in (26) as viable formation rules of syntax. If one is also concerned with semantics, one will find such a view too simplistic and come to realize one has to do something more than just give the flat structures in an once-for-all manner.

4. On PNs and identity.

MG normally takes sentences like the following as unambiguous:

    b. John will walk.
Potentially we could assign two readings to each, which may be roughly paraphrased as:

29) a. i. The person who is John in the real world walks in any world at any time.\textsuperscript{25}
   ii. In any world at any time the individual who \textit{j} denotes at that world walks.

b. i. The person who is John in the real world walks at some future time.
   ii. Whoever is the denotation of \textit{j} at some future time walks then.

In order to make sentences in each pair synonymous so that (28) (a), (b) each becomes unambiguous, it is required that PNs like John have invariant denotation across indices. This requirement (on the possible interpretation) is given in the form of a meaning postulate like:

30) \( (\exists x)\Box [x = j] \).

The quantifier that appears outside the scope of \( \Box \) ensures that there is a particular individual invariant across indices that is a denotation of \textit{j}. A constant like \textit{j} is called "rigid designator". We could similarly require that in (11), which is a translation of (10), \( t \), \( h \), and \( z \) be rigid designators. If this is done, then the transla-
tions in (11) all have the same effect with respect to the law of substitution: whenever identity holds in the form of (11) (a), (b) or (c), (d), the substitution is guaranteed to hold across indices. But as we have seen with Bo Derek-Cathleen Collins example, this is not always the case. The requirement of rigid designation merely represents the ideal usage of PNs. But it is a good requirement since we would want an entailment like the one below from (a) to (b) to always hold in Japanese.

31) a. \textit{Hanako-ga sin-de-iru}\textsuperscript{26}  
\hspace{1cm} \textit{Hanako is dying}  
\hspace{1cm} \textit{(lit.) "Hanako is dying."}  
\hspace{1cm} \textit{"Hanako is dead."}  

b. \textit{Hanako-ga sinda}  
\hspace{1cm} \textit{Hanako died}  
\hspace{1cm} \textit{"Hanako died."}  

Without the requirement of rigid designation, there is no guarantee that we are talking about the same individual named Hanako (i.e., h), and hence the entailment would fail.

On the other hand, there are occasions when PNs do not behave like rigid designators. The following is one such example.
32) Taroo-ga tyoonan  de nai hazu-ga nai
   Taroo first-born son is not cannot be
   "It cannot be that Taroo is not a first-born son."

Equating nai hazu-ga nai with "it is impossible that ... not ...", this sentence seems equivalent to saying:

33) "It is necessarily the case that whoever happens to be Taroo at any index is a first-born son."

Taroo, or rather t in the translation $\lambda P \check{v}P(t)$, in this example seems to have a variant designation from index to index. Exactly when this usage of PNs is intended is not easy to determine, and we must ignore this usage in our grammar. 28

Our Bo Derek-Cathleen Collins example, however, seems a more well-defined case than examples like (32). It appears to me that whenever one adopts a pseudonym alongside one's real name, the pseudonym comes to function as a non-rigid designator. While what counts as a pseudonym may be a difficult issue to decide, in our grammar, we will assume that Boo is a pseudonym of Kyasarin, and accordingly we let only Kyasarin alongside Taroo, Hanako, and Ziroo (and some others to be added later) be rigid designators, i.e.:
34) MP 1. $(\forall x) (x = \alpha)$ where $\alpha = t, h, z, \text{ and } k.$

In other words, in our grammar of Japanese, Boo is a representative of pseudonyms in the language. It appears pseudonyms have some semantic restrictions. Thus while the remark made on (12) following this example (pp. 54-5), I believe, is correct, the conclusions (ii) (a) or (b) below from the premises (i) seem both valid.

35) i. a. Kyasarin-ga sin-de-iru

Cathleen is dying

(lit.) "Cathleen is dying."

"Cathleen is dead."

b. Kyasarin-ga Boo dearu

Cathleen Bo is

"Cathleen is Bo."

ii. a. Kyasarin-ga sinda

Cathleen died

"Cathleen died."

b. Boo-ga sinda

Bo died

"Bo died."

Since the past tense creates an intensional context, the law of substitution should not hold, given that Boo is not a rigid designator (as was the case with (12)). Here, then,
it appears that we have to distinguish at least three notions involved when one says something is a rigid designator. They are:

36) i. rigid designation across indices,
   ii. rigid designation across possible worlds, and
   iii. rigid designation over moments of time.

The first type is an over-permeating rigid designation while (ii) and (iii) might be called partially-rigid designation. Our familiar Boo, it appears, is of the third type, for note that in spite of the fact that only extensional identity is said to hold at the present moment in (35ib), Boo has been substituted for Kyasar in (35iib), which is a past tense sentence. This is only explainable, it seems to me, by assuming that pseudonyms like Boo behave like a rigid designator with respect to moments of time, and like a non-rigid designator with respect to possible worlds. This, I believe, is in accord with our intuition about the usage of such names. Thus Bo is always Bo as we know her so long as she is in our own world just as Cathleen or Taroo is. Once she appears in a world different than ours, well, only God knows what kind of individual she might be, if ever there was such a person named Boo. In order to reflect this aspect of pseudonyms, we introduce two additional modal operators "□", "□". These may be
roughly characterized, alongside of "☐" as follows:

37) a. ☐ ..... "necessarily, always"
b. ☐ ..... "always"
c. ☐ ..... "necessarily"

"☐" then is definable in terms of "☐" and "☐" though we will not concern ourselves with this issue. We now give another meaning postulate that has to do with our prototypical pseudonym Boo.

38) MP 2. (有一次) ☐ [x = α] where α = b.

This guarantees that the constant b is a rigid designator over moments of time, or t-rigid designator. Accordingly substitution based on extensional identity like k = b holds even when b is substituted for k so long as such substitution is not carried out within the scope of ☐ or ☐ or ☐.

At the moment I cannot think of any good example of a w-rigid designator, i.e., a constant whose denotation is invariant only across worlds. Whether this is an accidental gap, or a hole in the pattern, or simply a lack of my imagination remains to be seen. A proper name that is neither t-rigid nor w-rigid may be exemplified by Misu Zyapan "Miss
Thus, given the translation \( \lambda P \varphi P(m) \) for this, the denotation of \( m \) varies across indices. This year's Miss Japan may not be, and it is most likely that it is not, the same individual as next year's or some other year's Miss Japan. Constants like \( m \) then cannot be quantified into any kind of intensional contexts, and this accords with our intuition.

Let me here give a summary table of classification of PNs according to their kinds of rigid designation.

<table>
<thead>
<tr>
<th>designation</th>
<th>examples</th>
<th>corresponding Japanese PNs</th>
<th>MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>rigid</td>
<td>( k, t, h, z )</td>
<td>Kyasarin, Taroo, Hanako, Ziroo</td>
<td>( (\exists x)\square(x = \alpha), \alpha = k, t, h, z. )</td>
</tr>
<tr>
<td>t-rigid</td>
<td>( b )</td>
<td>Boo</td>
<td>( (\exists x)\Box(x = b) ).</td>
</tr>
<tr>
<td>w-rigid</td>
<td>*</td>
<td>*</td>
<td>( (\exists x)\Box(x = \alpha), \alpha = ? )</td>
</tr>
<tr>
<td>non-rigid</td>
<td>( m )</td>
<td>Misu Zyapan</td>
<td>*</td>
</tr>
</tbody>
</table>
Finally, let us illustrate how our rules are going to produce predicate nominal T constructions.

40) Taroo-ga Hanako da

Taroo Hanako is
"Taroo is Hanako."

\[
\begin{array}{l}
[[[\text{Taroo}_T \rightarrow]_1 [\text{Hanako}_T [\text{da}_C]]_T & :S2 \\
[\text{Taroo}_T] & [[[\text{Hanako}_T [\text{da}_C]]_{IV} & :S5 \\
& [\text{Hanako}_T]
\end{array}
\]

The top line of the analysis tree is equivalent to the tree diagram:

41)

The translation rules will assign the following translation. (Read "\Longrightarrow" as "translates as", and "\Longleftrightarrow" as "converts to (based on definitions, notational conventions,
meaning postulates, and rules of intensional logic).\(^{31}\)

42)

1. \[[\text{Hanako}]_T \Rightarrow \lambda P \cdot P(h)\] : T1
2. \[[[\text{Hanako}]_T [\text{da}]_C]_T \Rightarrow \lambda P \cdot \lambda x \cdot \{\lambda y [x = y]\} \quad (^{\lambda P} \cdot P(h))\] : T5
3. \[\rightarrow \lambda x (\lambda P \cdot P(h)) \{\lambda y [x = y]\}\] : \lambda-conversion
4. \[\rightarrow \lambda x (\lambda P \cdot P(h)) (\lambda y [x = y]\} \] : Brace Convention
5. \[\rightarrow \lambda x \lambda P \cdot P(h) (\lambda y [x = y]\} \] : Down-Up Cancellation
6. \[\rightarrow \lambda x (\lambda P \cdot P(h))(h)\] : \lambda-conversion
7. \[\rightarrow \lambda x (\lambda y [x = y]\} (h)\] : Down-Up Cancellation
8. \[\rightarrow \lambda x [x = h]\] : \lambda-conversion
9. \[[\text{Taroo}]_T \Rightarrow \lambda P \cdot P(t)\] : T1
10. \[[[\text{Taroo}]_T -1 [\text{Hanako}]_T [\text{da}]_C]_T \Rightarrow \lambda P \cdot P(t) (^{\lambda x} [x = h])\] : T2 (8,9)
11. \[\rightarrow ^{\lambda x} [x = h](t)\] : \lambda-conversion
12. \[\rightarrow \lambda x [x = h](t)\] : Down-Up Cancellation
13. \[\rightarrow t = h\] : \lambda-conversion

Our position on the verb da "is" is thus 1) that it is syncategorematic and hence predictable in the syntax, and 2) that its semantic contribution is null, the extensional
identity being part of the structural meaning of predicate nominal constructions. Point (2), I think, is in accord with the observation that a variety of meanings are associated with predicate nominal constructions depending on the kind of noun that enters as predicate nominals and the kind of contexts in which these are used. Points (1) and (2), I feel, should go hand in hand, and we will constrain our grammar by requiring that if an expression is syncategorematically introduced in the syntax, the expression make no semantic contribution, and vice versa. To make this requirement non-empty, we will require that expressions may be syncategorematically introduced if and only if such an expression is the only expression that can be structurally predicted to occur in the specified position.32 We thus preclude syntactic analyses like PTQ S2 and S17, where a variety of expressions are introduced in the same syntactic position. This concern about the syntactic predictability and the semantic contribution is linguistic, rather than logical, and obviously our requirement about their relation is simply one of the many that linguists may propose in the hope of constraining the range of possible grammatical analyses. We will see in the next section and in Chapter V several examples of analyses that exemplify this requirement about the syntactic predictability and the semantic contribution, which we hereby christen the bastard principle. The bastard principle is, then,
along with a few points noted in the second paragraph on p.63 a litmus paper to test whether a given analysis is possible or not within our framework.

5. Predicate nominal CNs.

We take the syntactic category CN, along with IV (intrasitive verb or verb phrase), to denote a set of objects. CNs like otoko "man", zyogakusei "girl student", and kappa "kappa" thus respectively mean a set of men, girl students, and kappas. We let a sentence like:

43) Taroo-ga otoko da
    Taroo man is
    "Taroo is a man."

come out true at an index <i,j> if and only if (iff) t is a member of a set of men at <i,j>. The new lexicon and the rules are:

44) $B_{CN} = \{ [\text{otoko}]_{CN}, [\text{zyogakusei}]_{CN}, [\text{kappa}]_{CN} \}$

S6. (Predicate nominal CN)

If $\alpha \in P_{CN}$, then $F_4(\alpha) \in P_{IV}$. (See S5 for $F_4$.)

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T6. If \( \alpha \in P_{CN} \), and \( \alpha \) translates as \( \alpha' \), then \( F_4(\alpha) \) translates as \( \alpha' \).

The generation of (43) with its translation follows:

\[
\begin{align*}
45) \quad & \left[ \text{Taroo} \right]_T \left[ \text{otoko} \right]_{CN} \left[ \text{da} \right]_C \quad : S2 \\
& \left[ \text{Taroo} \right]_T \left[ \text{otoko} \right]_{CN} \left[ \text{da} \right]_C \quad : S6 \\
& \left[ \text{otoko} \right]_{CN} \\
\end{align*}
\]

Translation:

1. \( \left[ \text{otoko} \right]_{CN} \rightarrow \text{otoko}' \) : T1
2. \( \left[ \text{otoko} \right]_{CN} [\text{da}]_C \rightarrow \text{otoko}' \) : T6
3. \( \text{Taroo}_T \rightarrow \lambda P^\forall P(t) \) : T1
4. \( \left[ \text{Taroo} \right]_T \rightarrow \lambda P^\forall P(t)(\text{otoko}') \) : T2 (3, 2)
5. \( \rightarrow \text{otoko}'(t) \) : \( \lambda \)-conversion
6. \( \rightarrow \text{otoko}'(t) \) : Down-Up Cancellation

Syntactically, predicate nominal constructions like (45) and (41) claim that Taroo is the subject (hence the node 1) of the sentence while other nominal elements like Hanako and gakusei are grammatical non-terms. Subject Honorification thus may be triggered by Taroo.35
46) **Taroo-san-wa otoko de-irassyaru**

*Taroo (polite) man is (honorific of da)*

"Taroo is a man."

Or Taroo may be raised from (a) to (b):

47) a. **Hanako-wa [Taroo-ga otoko da] to omou**

Hanako [Taroo man is] comp. think

"Hanako thinks that Taroo is a man."

b. **Hanako-wa Taroo-o [∅ otoko da] to omou**

"Hanako thinks Taroo to be a man."

6. More on CNs.

6.0. CN subjects?

Consider now a pair of sentences like:

48) a. **Hanako-ga zyogakusei da**

Hanako girl-student is

"Hanako is a girl-student."

b. **zyogakusei-ga Hanako da**

girl-student Hanako is

(lit.) "A girl-student is Hanako."
"A girl-student, Hanako is."

"The one who is a girl-student is Hanako."

Outside of contextually influenced aspects of meaning like topic (cf. footnote 1), which may be more saliently marked by replacing *ga* by *wa* in (b), or perhaps a syntactically definable case of contrast as in:

49) *zyoyuu-ga* Boo *de* *zyogakusei-ga* Hanako *da*

   actress  Bo is+and girl-student  Hanako is

   "An actress, Bo is, and a girl-student, Hanako is."

(48) (a) and (b) are fully synonymous; they mutually entail each other, and there is no circumstance under which one is true without the other being also true. To propose a new subject-verb rule with a corresponding translation rule, it appears, would be to lose a syntactic generalization. For note what kind of fancy maneuvering such a position would necessitate. First, we would need a rule that combines a CN and an IV to form a sentence; furthermore, we would have to ensure that this CN in fact semantically behaves like a predicate and that the T phrase inside IV behaves like a subject, which, in turn, would mean that we would have to posit another rule, alongside of S5, that generates predicate nominal Ts inside IV phrases that later combine only with CNs to form a sentence. Such an interlocking of
features having to do with "global derivation" makes the
notion possible grammar rather vacuous and empty, tolerating
an unrealistically wide range of possible grammatical analy­
ses. Rather than set up new formation rules, it appears
that (48) (a) and (b) are to be syntactically related by a
transformation, with the translation giving an identity
mapping. Such a rule might look like this:

50) SS1. (Predicate nominal CN shift)
   
   T, -, CN, C
   1, 2, 3, 4  ---->
   3, 2, 1, 4

where "----->" reads as "transforms as".

TT1. Identity mapping.

These may be understood as abbreviating each of the following
rules:

51) SS1. (Predicate nominal CN shift)
   
   If $\phi \in \mathcal{P}_T$ and $\phi$ has the form $[[[\alpha]_T -]_1[\beta]_{CN} [\gamma]_C]_t$,
   then $F_1, (\phi) \in \mathcal{P}_T$, where $F_1, (\phi) = [[[\beta]_{CN} -]_1[\alpha]_T$
   $[\gamma]_C]_t$.
TT1. If $\phi \in \mathcal{P}_T$, and $\phi$ translates as $\phi'$, then $F_1, (\phi)$
   translates as $\phi'$.
(For convenience we prefix transformational rules with "SS" and their translation rules "TT", and index each operation in the rule with a primed numeral.) For our purpose, we regard any syntactic rule whose operation takes, as input and output, a single expression of category t (i.e., sentence), to be a transformational rule. In specifying a structural description, we thus follow Partee (1975, 1979) that an operation as appears in the rule of syntax is in general a partial, as opposed to a complete, function, especially where a transformation is involved. Wherever convenient, we will use a format like (50), and understand that sequences like 1, 2, 3, 4 and 3, 2, 1, 4 properly analyze a sentence.

Needless to say, (50) is not the only way available to relate syntactically the pair in (48). Consider, for instance, the following:

52) zyogakusei na no-ga Hanako da
girl-student is comp.-ga Hanako is
"The one who is a girl-student is Hanako."

which of course is a clefted version of (48a). Since clefting is necessary any way (in a surfacy grammar), it may be that (48b) is to be derived from (48a) via (52), which are all well-formed sentences. But at present, it
looks to me that the deletion of *na no* from (52) to derive (48b) is, if not more, as arbitrary as (50), for consider:

53) a. *Hanako-wa Boo-ga zyoyuu na no-ga* gaman dekinai

   Hanako Bo actress is comp.-ga cannot stand

   "Hanako cannot stand (it) that Bo is an actress."

   b. *Hanako-wa Boo-ga zyoyuu Ø Ø-ga gaman dekinai*

The deletion of *na no* thus is in general impossible. To delete *na no* in (52) to derive (48b) is tantamount to requiring that the information be available that (52) is the result of applying clefting. This involves derivational history, and this, where possible, is to be avoided for the reason mentioned on pp.79-80. Another proposal that clefting be divided into two parts — one for the predicate nominal constructions and the other for other cases — is equally unattractive. For the present purpose we will stick to the analysis (50). The only point that is to be emphasized through these approaches is that a sentence like (48b) entails and is entailed by (48a); hence they are synonymous, and there is no such thing in our grammar as basic CN subject that combines with an IV to form a sentence.
6.1. CN Conjunction?

Observe now the following sentences:

53) a. Hanako-ga zyoyuu de zyogakusei da
   Hanako actress and girl-student is
   "Hanako is an actress and a girl-student."

b. Taroo-ga isya de ongakuka da
   Taroo doctor and musician is
   "Taroo is a doctor and musician."

On the force of these sentences, one might propose a structure like the following for (53a):

54) 

\[ \begin{array}{c}
\text{t} \\
\text{I} \\
\text{T} \\
\text{CN} \\
\text{CN} \\
\text{Hanako - zyoyuu de zyogakusei da} \\
\end{array} \]

and say that one needs a rule for CN conjunction. We would indeed have a strong case of CN conjunction, were the structure:
to always act like a single CN. But we note that while (a) and (b) below are perfectly grammatical, (c) is completely out, where subete-no, as we will see in the next chapter, is a quantifier that combines with a CN to form a derived T phrase.

56) a. subete-no zyoyuu-ga kita
   every actress came
   "Every actress came.

   b. subete-no zyogakusei-ga kita
   every girl-student came
   "Every girl-student came."

   c. *subete-no zyoyuu de zyogakusei-ga kita
   every actress and girl-student came
   ?"Every actress and girl-student came."

Instead we would have to say something like:

57) subete-no zyoyuu de zyogakusei no/dearu hito-ga kita
   every actress and girl-student is person came
"Every person who is (both) an actress and girl-student came."

Thus the ungrammaticality of (56c) casts strong doubt on a rule of CN conjunction. Indeed sentences like (53) are more naturally regarded as IV conjunction in view of sentences like:

58) a. \[ \text{Hanako-ga zyoyuu } \begin{cases} \text{ni-}39 \\ \text{dear-} \end{cases} - \text{te zyogakusei } \begin{cases} \text{da} \\ \text{dearu} \end{cases} \]

Hanako actress be- -and girl-student is
"Hanako is an actress and a girl-student."

b. \[ \text{Taroo-ga isya } \begin{cases} \text{ni-}39 \\ \text{dear-} \end{cases} - \text{te ongakuka } \begin{cases} \text{da} \\ \text{dearu} \end{cases} \]

Taroo doctor be- -and musician is
"Taroo is a doctor and a musician."

As we will see in Chapter V, there is a natural process of IV conjunction in Japanese, which can give rise to these sentences. Since ni- "be" alternates with "∅" with the condition noted in footnote 39, (53) (a), (b) are best regarded as ∅-variant of (58) (a), (b) respectively.

One construction that may be regarded as involving CN conjunction is the one with the particle -ken- (حرف), which literally means "unite, unify, or join together" and may
be compared to English hyphenated expressions like:

59) a. He is a physician-musician.
    b. Every musician-philosopher-linguist came.

Thus we have:

60) a. Taroo-wa isya -ken- bengosi da
    Taroo doctor - lawyer is
    "Taroo is a doctor-lawyer."

    b. subete-no isya -ken- bengosi-ga kita
    every doctor - lawyer came
    "Every doctor-lawyer came."

But it appears -ken- type construction is better regarded as part of a process of word formation. Note that when derived CNs are conjoined with this particle, the result sounds very strange, as do the corresponding English expressions:

61) a. ?Taroo-wa yasasii isya -ken- nessin-na bengosi da
    Taroo kind doctor - devoted lawyer is
    ?"Taroo is a kind doctor-devoted lawyer."

    b. ?subete-no [boku-ga sinraisuru isya] -ken- [boku-ga
    every [I trust doctor] - [I

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To avoid these undesirable consequences, it seems it is best to regard the -ken- construction as generating members of $B_{CN}$ from members of $B_{CN}$; that is to say, it is a word formation process.  

6.2. Derived CNs.

In addition to basic CNs, Japanese (or any other language for that matter) has processes that derive expressions that behave as CNs. Though semantic facts are not always clear-cut, we outline here three of these processes.

6.2.1. CN/CN.

Consider a modifier like moto (元) "former", whose counterpart in English has been discussed here and there in MG. Given a sentence like:

62) Hanako-wa moto zyoyuu dearu

Hanako former actress is
"Hanako is a former actress."

it is obvious that to determine the truth value of this sentence at the index \(<i,j>\), it is not enough to know the denotation of \(zyoyuu\) at this index. Rather we have to be able to know its denotation at some time \(j'\) such that \(j'<j\). By taking a look at the denotation at \(j'\), we can determine whether Hanako was an actress then or not (i.e., whether Hanako was in the set denoted by \(zyoyuu\) at that time or not). \(Moto\) thus semantically has to take the intension of the CN it modifies; it then forms a new CN such that \(moto\ \ zyoyuu \ "former \ actress"\) would be equivalent to, say, \(izen\ \ zyoyuu\ \ deatta\ \ hito\ "the\ one\ who\ was\ formerly\ an\ actress"\). Though morphologically complex, expressions like \(mirai\ \ no\ "future"\) and \(mukasi\ \ no\ "former\ (lit.\ of\ old\ days)"\) also behave like \(moto\) semantically, and these may be grouped together as expressions of \(B_{CN/CN}\), leaving for the time being the fact that expressions like \(mirai\ \ no\ "future"\) and \(mukasi\ \ no\ "former"\) are themselves derived via the genitive \(no\) by some process unbeknownst to us for a grammar of word formation to account for.

63) \(B_{CN/CN} = \{[moto]_{CN/CN}, [mirai\ \ no]_{CN/CN}, [mukasi\ \ no]_{CN/CN}\}\).

("former", "future", "former")

The syntactic rule and its translation having to do with
these modifiers will be given in the next subsection after we have discussed adjectives.

6.2.2. Adjectives.

The following observation is also familiar enough, and echoes remarks made here and there in MG. Adjectives in an attributive function may be semantically divided into two groups: intersective and nonintersective. The former group most typically includes adjectives like aoi "blue", akai "red", etc., and the latter yoi "good", rippa na "fine", etc. While intersective adjectives allow the entailment pattern exemplified in (a) below, nonintersective adjectives do not.

64) a. i. kore-wa aoi isi dearu
   this blue rock is
   "This is a blue rock."

   ii. kore-wa aoi si kore-wa isi dearu
       this blue and this rock is
       "This is blue and this is a rock."

   ((i) entails (ii).)

b. i. Boo-wa rippa na zyojuu dearu
   Bo fine actress is
   "Bo is a fine actress."
Thus while Bo may be fine as an actress, she may not be a fine producer, or she may not be a fine anything else. It would be best, it seems, to assume that an adjective like rippa na "fine" here takes the intension of a CN and makes a new CN that denotes a set of individuals fine as CN. Exactly what semantic characteristics such an adjective might have is something we do not have to concern ourselves with, the task being that of a lexicographic study of words. For the purpose of formal semantic method, we simply note that nonintersective adjectives denote a function that takes the intension of a CN and gives as value a new CN. Following Siegel (1976), we regard intersective adjectives as being derived from relative clause structures, as briefly discussed in the following subsection and later in Chapter VI. Since we have assigned the category CN/CN to modifiers like moto "former" in the previous subsection, we assign CN//CN to nonintersective adjectives:

\[
B_{CN//CN} = \{ [yoi]_{CN//CN}, [\text{rippa [na]}'_{CN//CN}] \}.
\]

("good", "fine")
While it is possible to assign a single category to CN/CN and CN//CN, I have not done so because 1) members of CN//CN are inflected forms of adjectives, and those in CN/CN are not, and 2) while the indicated entailment fails with CN/CN, it holds with CN//CN:

66) a. CN/CN: (i) does not entail (ii).
   i. Hanako-wa moto zyoyuu dearu
   Hanako former actress is
   "Hanako is a former actress."
   ii. Hanako-wa zyoyuu dearu
   Hanako actress is
   "Hanako is an actress."

b. CN//CN: (i) entails (ii).
   i. Hanako-wa rippa na zyoyuu dearu
   Hanako fine actress is
   "Hanako is a fine actress."
   ii. Hanako-wa zyoyuu dearu
   Hanako actress is
   "Hanako is an actress."

Although I anticipate some syntactic differences between these two categories, I cannot, at the moment, think of constructions that differentiate the two, and in this regard, the distinction of these two categories should be viewed tentative. The syntactic rule and its translation
covering both CN/CN and CN//CN are:

66) S7. (Derived CN)

If \( \alpha \in P_{CN/CN} \) or \( P_{CN//CN} \), \( \beta \in P_{CN} \), then \( F_5(\alpha, \beta) \in P_{CN} \), where \( F_5(\alpha, \beta) = [\alpha \beta]_{CN} \).

T7. If \( \alpha \in P_{CN/CN} \) or \( P_{CN//CN} \), \( \beta \in P_{CN} \), and \( \alpha \) and \( \beta \) translate as \( \alpha' \), \( \beta' \) respectively, then \( F_5(\alpha, \beta) \) translates as \( \alpha'(^\beta') \).

Except for the application of S7 (and T7), the generation of sentences like (62) and (64bi) (and their translations) parallels the sample analysis tree (and its translation) (45). (62), for instance, has the following structure and translation assigned to it. (Cf. footnote 2 for alternative forms of the copula da and dearu.)

\[ 67) \]

```
        t
       / \  
      /   \ 
     l    CN
    /    /  
   T  CN/CN CN
        /    
       Hanako moto zyoyuu dearu
```

Translation: \textit{moto}'(\textit{\^{zyoyuu}}')(\textit{h}).

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Since S7 is recursive, an expression like the following is also well-formed, and receives due translation:

68) a. moto mirai no zyoyuu
   "former future actress"
   
   b. moto rippa na zyogakusei
   "former fine girl-student"

   etc.

6.2.3. Relative clause constructions.

Relative clauses in general are discussed in Chapter VI, but since these derive CNs, they are introduced here so that we can talk about expressions like:

69) a. Taroo-ga naguru zyosei
    "woman Taroo hits"
    
   b. Hanako-ga mituketa kappa
   "kappa Hanako found"

The construction is semantically intersective in that in (a),
For instance, the whole expression denotes the individuals that are in the cross section of those in the set of individuals that Taroo slaps and those in the set of individuals that are women. Though the precise translation of this rule is yet to be given, we can continue our discussion with the following preliminary formulation.

70) S31'. (Relative clause CN)

If $\phi \in P_T$ and has the form $\xi \{[\text{[kare}_n]_T -\} [\text{[naguru]}_V]_t [\text{zyosei}]_{\text{CN}} \}$

$\left( m = 1, 2, 3 \right)$ and $\alpha \in P_{\text{CN}}$, then $F_{29, n}(\phi, \alpha) \in P_{\text{CN}}$,

where $F_{29, n}(\phi, \alpha) = [\xi \xi \alpha]_{\text{CN}}$.

T31'. If $\phi \in P_T$, $\alpha \in P_{\text{CN}}$, and $\phi$, $\alpha$ translate as $\phi'$, $\alpha'$ respectively, then $F_{29, n}(\phi, \alpha)$ translates as

$\lambda x_n[\phi' \& \alpha'(x_n)]$.

Accordingly we add variable pronouns of category T to $B_T$: $[\text{[kare}_0]_T$, $[\text{[kare}_1]_T$, $[\text{[kare}_2]_T$, etc. (69a) may be generated in the following fashion.

71) $[[[\text{[Taroo]}_T -1 [\text{[naguru]}_V]_t [\text{zyosei}]_{\text{CN}}]_{\text{CN}} : S31' \right.$
The top line above of course is equivalent to the tree:

72) \[
\begin{array}{c}
\text{CN} \\
\text{t} \\
\text{V} \\
\text{Taroo} \\
\text{naguru} \\
\text{zyosei}
\end{array}
\]

Given the extensionality of verbs like naguru "hit" with respect to the object position, the top line of (71) translates as:

73) \[\lambda x_{4}[\text{naguru}'_{x}(t, x_{4}) \& \text{zyosei}'(x_{4})].\]

Thus, this denotes a set (or a characteristic function thereof) of those who Taroo hits and who are women.

7. Summary.

After giving a classification of predicate nominal constructions (section 1), we set out to discuss two of these: the one with predicate nominal Ts and the one with predicate nominal CNs. After making clear that the former
involves extensional identity (section 2), we set down basic rules that generate syntactic structures of the sort outlined in section 3.3, Chapter II, together with corresponding translation rules (section 3). We also noted there what kind of structural changes our structural rules may effect on argument structures. Next, in section 4, we attempted preliminary classifications of Japanese PNs, according as they are rigid designators, t-rigid designators, w-rigid designators, or non-rigid designators. We also proposed a possible constraint on analysis under the name the bastard principle to exclude a certain set of grammatical analyses having to do with syncategorematically introduced expressions. Then in section 5, we took up a predicate nominal construction with CNs in the predicate position, and gave syntactic and translation rules responsible for this construction. Our position on this structure, and the one discussed in section 2, is that the copula does not make any semantic contribution, and that in the identity statements, it is the structural configuration that determines the proposed meaning reflected in the translation rule. Section 6 was an examination of a variety of possible analyses having to do with CNs. We rejected (6.0) a formation rule that forms a sentence with a CN subject and an IV, and instead proposed a transformational rule that accounts for an apparent case of CN subjects. We also outlined other compatible transformational analyses like pseudo-clefting.
and noted some problems involved. Then in section 6.1, we examined the possibility of a rule of CN conjunction, rejected it on syntactic grounds, and pointed out the viability of such conjunction as part of word formation with respect to a certain particle. Section 6.2 was a discussion on processes that derive CNs, based on standard literature. We introduced intension-taking particles that form new CNs from CNs (6.2.1), adjectives, both traditional adjectives and nominal adjectives in Japanese, that take the intension of a CN to form a new CN (6.2.2), and relative clause constructions that form a CN from a sentence and a CN (6.2.3), with syntactic and translation rules for each.
Footnotes to Chapter III

Further limitations of scope we must indicate at the outset are 1) that problems of syntax and semantics regarding particles like *wa* "(topic marker)", *sae* "even", etc. are not dealt with at all, and 2) that analysis of verb aspects is completely neglected. Regarding (1), *wa* particularly presents many difficult problems. Note that, except when it indicates contrast, *wa*'s main function is to indicate the topic of conversation, and that any sentence normally uttered being about something except when it is presentational or existential in force, every sentence given in isolation without *wa* attached to some nominal has the undesirable potential of "sounding odd or strange" to the native-speaker's ear. This is particularly true with predicate nominal constructions since these are mostly statements about something already mentioned in the discourse. Thus, in what follows, when a sentence really sounds bad without any indication of topic, I will freely supply *wa* in order to make it sound natural. Unless otherwise mentioned, the topic so chosen is the subject of the sentence: when the subject particle is *ga*, this means that the subject noun will be followed directly by *wa* since the combination *-ga-wa* is not allowed in Japanese (as opposed to, say, a combination like *-to-wa* "-with-Topic"). Should one be bothered by *wa*, one can replace this with *ga* and add
the complementizer koto "(that)" at the end of the sentence, for this would make the wa-less sentence a subordinate clause, with the consequence of its sounding more natural. It is not clear at present, given the principle of compositionality, what kind of semantic, if it is semantic, interpretation should be assigned to a sentence that contains the topic particle wa over and above what we do in the way of interpreting its wa-less counterpart. To simply mark a noun or noun phrase with a feature [+topic], it seems, is to just name the problems without really solving them.

Standard grammatical particles, with their corresponding case names and representative functions, are:

<table>
<thead>
<tr>
<th>Particle</th>
<th>Case Name</th>
<th>Representative function</th>
</tr>
</thead>
<tbody>
<tr>
<td>ga</td>
<td>nominative</td>
<td>subject</td>
</tr>
<tr>
<td>o</td>
<td>accusative</td>
<td>direct object</td>
</tr>
<tr>
<td>ni, (e)</td>
<td>dative</td>
<td>indirect object</td>
</tr>
<tr>
<td>ni, de</td>
<td>locative</td>
<td>place/time</td>
</tr>
<tr>
<td>kara, (ni)</td>
<td>ablative</td>
<td>source</td>
</tr>
<tr>
<td>de</td>
<td>instrumental</td>
<td>instrument</td>
</tr>
<tr>
<td>to</td>
<td>commitative</td>
<td>accompaniment</td>
</tr>
</tbody>
</table>

(The table is based on Mikami (1972: 89).) Ga, o, ni may be considered as the most unmarked grammatical particles that indicate respectively subject, direct object, and indirect object. No one-to-one correspondence, however, is
to be expected (as is obvious from the multiple occurrence of ni). Ga could indicate direct object, and so could ni, which also can indicate subject. Ni thus can indicate at least five functions, as illustrated below:

i) subject: **Hanako-ni eigo-ga wakaru**

   **Hanako** English understand
   "Hanako understands English."

ii) direct object: **Taroo-ga Hanako-ni katu**

   **Taroo** Hanako win
   "Taroo beats Hanako."

iii) indirect object (unmarked case):

   **Taroo-ga Ziroo-o Hanako-ni syookaisuru**

   **Taroo** Ziroo Hanako introduce
   "Taroo introduces Ziroo to Hanako."

iv) place/time:

   **Taroo-wa nitiyoobi-ni gakkoo-ni ita**

   **Taroo** Sunday school existed
   "Taroo was at school on Sunday."

v) source: **Taroo-ga Hanako-ni hon-o karita**

   **Taroo** Hanako book borrowed
   "Taroo borrowed a book from Hanako."

(One sub-type of source-indicating ni is the ni that indicates the agent in a passive sentence; in addition to these, we also have a goal-indicating ni.)
Turning now to the second point mentioned at the beginning, i.e., the problem of verb aspects, we first note that verb aspects and tenses are so closely related that it would be impossible, in the long run, to separate the two. Thus, in Japanese, a sentence in the progressive form can indicate either an on-going event or a resultant state.

vi) Hanako-ga ie-o tate-te-iru

Hanako house is building

a. "Hanako is building a house."

b. "Hanako has built a house."

Only the second reading entails the following:

vii) Hanako-ga ie-o tate-ta

Hanako house built

"Hanako built a house."

Thus we have to clarify what kind of semantic modification an aspectual element effects on the verb or sentence it operates on. Furthermore, depending on the semantic type of the verb involved, the ambiguity noted above may not be always easy to detect. A verb like sinu "die", for instance, when modified by the progressive aspectual element -te-iru, almost always indicates the resultant state as in:
viii) **Hanako-ga sin-de-iru**

Hanako is dying

a. ?*"Hanako is dying."

b. "Hanako is dead."

Clearly an analysis of verbs according to their semantic types is also necessary. Moreover, we have to specify what the truth conditions of a sentence with some aspec-tual modification are. Is it true at a moment of time, or in an interval of moments of time? These and other related problems, indispensable though their analyses are in a reasonable grammar of Japanese, are all left out of account simply because of the complexity and difficulty of the issues involved. For a logic of tense and aspect in English, see Bennett and Partee (1978), where they outline interval semantics of aspect and tense, together with the indication of problems related to such an approach. Dowty (1977) is an outgrowth of Bennett and Partee (1978), the latter having influenced the former in a manuscript form. (According to Dowty (1977: 56), Bennett and Partee (1978) is "similar to earlier analyses by Scott (1970) and" Montague (1974: "Pragmatics and intensional logic").

We are also making a tacit simplifying assumption that the simple present in Japanese does not indicate future. Thus, given:

- 102 -
ix) **Taroo-ga Hanako-o naguru**

Taroo    Hanako    hit
"Taroo hits Hanako."

data this sentence is considered to be true in a world \( i \) at time \( j \), iff Taroo hits Hanako at time \( j \) in world \( i \). In reality, however, (ix) more normally means "Taroo will hit Hanako."

In general, verbs of action all have this feature. The only occasions (ix) most normally means what it is purported to mean in our grammar, so far as I know, are:

x) a. when one is using (ix) to describe an on-going event; most typically this type of sentences are used by sports news-casters. Thus:

Hara-ga booru-o toru! nirui-e nageru!
Hara    ball    catch    second    throw
"Hara catches the ball! (He) throws (it) to second!

Kakefu-ga suberikomu! tatti! auto!
Kakefu    slide    into    touch    out
"Kakefu slides into (second)! Touch! Out!"

b. when (ix) is embedded as a complement to verbs of perception (a) or verbs that require simultaneity (b).
a) Ziroo-wa Taroo-ga Hanako-o naguru no-o mita
   Ziroo  Taroo  Hanako  hit  comp.-o saw
   "Ziroo saw Taroo hit Hanako."

b) keikan-wa Taroo-ga Hanako-o naguru tokoro-o
taihosita
   policeman  Taroo  Hanako  hit  comp.-o

   arrested
   "The policeman arrested Taroo in the act of
   hitting Hanako."

On problems related to tense, aspect, and verb classification, see works like Kindaichi (1950), Vendler (1967: "Verbs and times"), Mikami (1972: Chapter III, sections 7-8, Chapter II, section 4), etc.

This simplifying assumption is in a sense forced upon us due to a lack of any workable analysis of aspect systems of Japanese. Very often it is true that stative verbs in the present tense are similarly interpretable as action verbs in the progressive. But, at present, there is no satisfactory semantic system to capture this generalization that can still maintain the compositionality of meaning and the strict correspondence of grammatical category and its semantic type. In the absence of such a system, I think our assumption, for the moment, is
unavoidable. One cannot simply say that (ix), for example, is true in a world \( i \) at time \( j \) iff Taroo hits Hanako in a world \( i \) at time \( j' \) such that \( j' \geq j \). For note that such a truth condition predicts wrongly that (xi) below could be true at \( j \) if, for instance, Taroo will hit Hanako at some future time \( j'' \) such that \( j' < j < j'' \), where \( j' \) is a moment of time at which (ix) is true.

\[
\text{xi) } \text{Taroo-ga Hanako-o nagutta}
\]

\[
\begin{align*}
\text{Taroo} & \quad \text{Hanako} & \quad \text{hit} \\
& \quad \text{"Taroo hit Hanako."}
\end{align*}
\]

Our grammar, in this respect, is thus grossly deficient, as are most of the works in MG. In the long run, the principle of semantic compositionality may have to be abandoned in the restricted sense that tense-aspect related semantic interpretation rules may have to be made sensitive to various verb sub-classes based on notions like stative, non-stative, process, achievement, and the like.

\[
\text{2Depending on the level of style with respect to politeness, the copula has the following variation:}
\]

\[
\begin{align*}
\text{informal: } & \text{da} \\
\text{polite: } & \text{desu} \\
\text{superpolite: } & \text{de gozaimasu}
\end{align*}
\]
formal writing: de aru

Of these I will use either da or de aru (or dearu), depending on the appropriateness of context; these differ in morphological alternation – da, for instance, takes on the form no or na prenominally while dearu does not change in this position. In the actual syntactic rules, I will use da as a representative copula. The problems of style of politeness are in general disregarded in this writing; the determining factor is mostly the social relationship between the speaker and the hearer. We use the lexical category label C for the copula while we use V for verbs, and A for adjectives; the traditional lexical category of nominal adjective is done away with in favor of A. The nominal adjective is viewed simply as another paradigm of adjectival inflection, following Mikami (1972). The representation of each lexical item in our grammar is:

<table>
<thead>
<tr>
<th>Category</th>
<th>Label</th>
<th>Sample Lexical Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copula</td>
<td>C</td>
<td>[da]C, [de aru]C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(&quot;walk&quot;, &quot;hit&quot;)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(&quot;good&quot;, &quot;young&quot;)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(&quot;healthy&quot;, &quot;quiet&quot;)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 106 -</td>
</tr>
</tbody>
</table>
On the relation between the lexical label and the category IV, see the remark on pp.61-62. On the prenominal attributive use of adjectives, see the brief sketch in section 6.2.2.

3 Of the grammatical particles mentioned in footnote 1, it is usual to call ga, o, ni in the first three functions of subject, direct object, and indirect object, as case particles, and the rest as adverbial particles. The motivation for this is obvious. Those that have to do with major grammatical functions are called case particles, and those that have to do with adverbial notions adverbial particles. Such a distinction is all the more important in a framework like MG, where a strict correspondence is required between a syntactic category and a semantic type. Since most adverbials semantically combine with verbal notions, or expressions of semantic type <e,t>, to produce new verbals, we have to distinguish the case particles from adverbial particles, the latter having a distinct semantic contribution to make in forming adverbial phrases. Also, following RG, term phrases in the function of subject, direct object, and indirect object (signalled by either ga, o, or ni), we call terms (or Ts), or where confusion is likely between MG syntactic Ts and RG terms, we call them grammatical terms; the adverbial expressions signalled by de, to, kara, etc. we call non-terms or non-grammatical terms.
These "certain types" include:

original adverbs: mata "again", tada "only", etc.

onomatopoetic adverbs: pata pata "pitter-patter", gata gata "clatter clatter", etc.

adjective-derived adverbs: usuku "thinly", zyoozuni "well", etc.

noun-derived adverbs: kinoo "yesterday", asu "tomorrow", etc.

etc.

(It is to be noted that when certain conditions obtain, some of these adverbs, especially noun-derived adverbs, may be followed by grammatical particles.)

Strictly speaking, this entailment is valid only if (2a) corresponded to English "Hanako has quit being a singer." Otherwise we have to guarantee that the time at which (3) is true is prior to the time (2a) is true. Since we are here touching on the syntactic form of these sentences, the point discussed is not affected by this logical "flop".

As for the particle retention in pre-copular position, see Haig (to appear), where it is proposed that retention...
or deletion of particles in this position (as a result of pseudo-clefting, for instance) is controlled by discourse factors as well as a deletion hierarchy of particles.

7 Re wa, see footnote 1 above.

8 See Kuno (1975: section 1) for discourse-oriented observations on this type of sentence.

9 Da, rather than de aru is most appropriate here because of the conversational tone.

10 See the reference in footnote 8.

11 "Property" here and in the context of MG is a technical term: an expression of type $<s,a,t>$ is said to denote a property of whatever is denoted by $a$. Thus, $<s,e,t>$ is a property of individuals, and $<s,<<s,t>,t>$ is a property of propositions. (Cf. Appendix A.) Generally speaking, Bennett's (1975) type assignment is like Montague's except that where Montague has $<s,e>$ in PTQ, Bennett has just e. Thus, wherever Montague has an individual concept, Bennett has an individual. Bennett's approach significantly simplifies semantics although it is not clear whether this approach will in the long run prove to be viable. As it stands, abolition of individual concepts gives rise to
Partee's paradox (PTQ p.268):

i. The temperature is ninety.
ii. The temperature rises.
iii. Ninety rises.

If we did not have individual concepts, the conclusion (iii) follows from (i) and (ii) as Montague noted. It appears it is this kind of example that primarily motivated Montague to adopt both individual concepts and individuals in his description of English. While I do not have anything to offer in the way of an alternative to Montague's solution, I still remain to be persuaded as to his analysis of numbers as being of the same semantic type as individuals.

12 Of course expressions in (11) are themselves expressions of intensional logic, and thus have to be interpreted, but I will hereafter informally say that when a natural language expression \( \alpha \) gets translated into an intensional language expression \( \alpha' \), \( \alpha \) means \( \alpha' \), assuming some sort of model theoretic interpretation of the latter. An interpretation of intensional logic expressions is given in the Fragment in Chapter VII, based on that given in PTQ.

13 Here and throughout the entire work, the capitalization of the first letter of PNs in Japanese is to be re-
garded as a matter of mere convenience, having no theoreti-
cal significance.

14 In general, the principle of lambda conversion and
substitution hold for intensional logic only between those
expressions of the same semantic type whose extensions do
not vary from index to index. Such expressions, called
modally closed expressions, may be recursively characterized.
The following, which is an adjustment of Dowty (1978: 130f),
defines the set of modally closed expressions:

(1) $v_{n,a}$ is modally closed for every variable $v_{n,a}$ of
every type $a$.
(2) $\alpha$ is modally closed for every expression $\alpha$ of
every type $a$.
(3) $\square \phi$, $F \phi$, $P \phi$ are modally closed for every expression
$\phi$ of type $t$.
(4) If $\alpha$ of type $<a,b>$ and $\beta$ of type $a$ are modally
closed, then so is $\alpha(\beta)$.
(5) If $\alpha$ is modally closed, then so is $\lambda u \alpha$, for any
variable $u$.
(6) If $\alpha$ and $\beta$ are modally closed expressions of
any type $a$, then so is $\alpha = \beta$.
(7) If $\phi$ and $\psi$ are modally closed formulas, then
so are $\square \phi$, $F \phi$, $P \phi$, $[\phi \& \psi]$, $[\phi \lor \psi]$, $[\phi \rightarrow \psi]$, $[\phi \leftrightarrow \psi]$, $(\forall u) \phi$, $(\exists u) \phi$. 

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The following are then valid formulas of intensional logic if either 1) $\alpha$ and $u$ do not stand within the scope of $\wedge$, $\Box$, $F$ or $P$ in $\phi$, or 2) $\beta$ and $\alpha$ are modally closed (Dowty (ibid.)).

$$\lambda u[\phi](\alpha) \leftrightarrow \phi^u_{\alpha}.$$

$$\alpha = \beta \rightarrow [\phi \leftrightarrow \phi^\beta_{\alpha}].$$

15 See, for instance, the discussion in Partee (1975: 247-8).

16 In isolation, this is the strongest argument for translating PNs like Taroo and Hanako directly as t and h, respectively. But such treatment will fail to express the syntactic parallelism between quantified expressions and PNs. Cf. the discussion referred to in footnote 15.

17 This makes sense to me only metaphorically as meaning "Taroo is the man of men." or "He is the man." (as Shakespeare described of Caesar). However, such metaphorical reading is beyond the grasp of our formal mechanism. Some sort of Gricean consideration may probably help in arriving at such a reading.

18 This consideration may help interpret (13) if we attribute God-like omnipresence to Taroo or Hanako.
EFL (p.190) has such a formula, where expressions like *it rains* is considered as a basic formula. It appears such a treatment of weather sentences conflicts with the principle of semantic compositionality. Thus, given a sentence like:

1) *it rains hard*

there would be no way to derive the VP *rain hard* such that *hard* semantically operates on the verb *rain* in order to express the manner the rain falls. For a possible treatment of weather sentences, based on Montague's idea that events semantically denote sets of moments of time, see Sugimoto (1980).

20Regarding the usage of the copula and the symbol C, see footnote 2.

21The type assignment to syntactic categories, as specified later in the Fragment, Chapter VII, is effected by a function f of the following sort:

1. $f(t) = t$
2. $f(CN) = f(IV) = <e,t>$
3. For all categories of A and B, $f(A/B) =$
   $f(\cdot\cdot//B) = f(A///B) = \ldots = <<s,f(B)>,f(A)>.$

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Note that T, TV are abbreviations for t/IV, IV/(t/IV), respectively. For these and other abbreviations, see Appendix A.

These analysis trees, as they are usually called in MG, merely serve to indicate the "history" of generation, and should not be identified with anything like "deep structure" in generative grammars. The trees in this regard are more like T-markers, which were "officially fired from work" in Chomsky (1965). Since Japanese is not a disambiguated language, such analysis trees may be viewed as bases for disambiguation. For the relation between ambiguous and disambiguated languages, see UG, p.226.

This is my guess: I have not seen so far any presentation of rules that produce the structures in question for Japanese. But it is, I believe, a reasonable guess.

Quantified expressions like minna "everyone" are treated in the next chapter.

Necessarily in MG is considered to mean "necessarily always", where "necessarily", "always" are equivalent to "in any possible world", "at any moment of time", respectively.
26 That such entailment holds in Japanese with respect to verbs of instantaneous completion like sinu "die", uma-reru "get born" all the more speaks for the need of the studies of aspectual systems of Japanese verbs. For a few references on this topic, see footnote 1 above.

27 It is to be understood that the name Taroo is given to the first-born son of a family.

28 Much less, the usage of PNs and CNs.

29 A pseudonym in this context is understood as any name other than the one originally given. This kind of consideration of course need not be reflected in the grammar at all. What we are attempting to do is to characterize the behavior of what people take to be pseudonyms, and not when or how people assume pseudonyms.

30 This is simply a Japanese counterpart of Miss America, which is often used as an example of non-rigid designators. Some people may prefer Misu Nippon, Nippon being the Japanese word for "Japan", but both are in use, with more people, I believe, favoring Misu Zyapan to Misu Nippon. It is not clear to me whether nouns like this are really PNs, or rather they should be considered to be CNs, whose set happens to be a singleton. A possible diagnostic test of PN-hood in
Japanese may be to see whether the expression can be used as a vocative, with the use of -san "Mr/Mrs/Miss". We can, for instance, say:

i) Taroo-san! "Taroo!"
ii) Hanako-san! "Hanako!"
iii) Misu Zyapan-san! (lit.) "Miss Miss Japan!"

According to such diagnosis, Misu Zyapan counts as PN while an expression like kono otoko "this man", which also selects a single unique individual, does not:

iv) *kono otoko-san (lit.) "Mr. this man!".

Since such a diagnostic is usually indicative, rather than definitive (note that this test cannot be applied to non-human nouns as well as nouns that serve to indicate titles, which are themselves used as vocatives in Japanese (John Haig (personal communication))), I am still in the dark as to the dividing line between PNs and CNs.

31 Except the fairly standard names, the names of definitions, notational conventions, and rules of intensional logic are based on Partee (1975), except "\(\lambda\)-conversion", which she calls "Abstract Application".
Outside of morphological alternation influenced by styles, that is. It appears this requirement on syncategorematic expressions is better relaxed slightly, which we will discuss in Chapter V when we get to conjunction and disjunction.

A kappa is a legendary river-dwelling monster resembling a human being in appearance, whose likes include eating cucumbers and scaring swimmers in the river.

Technically we are taking the denotation of CNs and IVs to be a characteristic function of such sets. Thus, if a, b, c, but not d are men, \( \text{otoko}'(a) = \text{otoko}'(b) = \text{otoko}'(c) = 1 \), and \( \text{otoko}'(d) = 0 \). In equating CNs and IVs as being both of the same semantic type \( <e,t> \), we may be forcing ourselves to miss an important generalization to be made about their syntactic and semantic differences. In the words of Gupta (1980: 1-2), "Common nouns, like predicates, are true or false of objects. They divide all the objects in the world into two classes: those objects that fall under them, and those that do not. That is, common nouns, like predicates, supply a principle of application. This principle determines the extension of the common noun, or the predicate, at each world (and time). But, as Geach has noted, common nouns, unlike predicates, also supply a principle of identity. A common noun, such as "river", eventuated.
provides a rule that determines when an object at a time (and a world) is the same river as an object at another time (and a world)." For a modal logic reflecting the difference as above between common nouns and predicates, see Gupta (1980). Keenan (1972), I believe, may be regarded as a grammar incorporating such difference in the tradition of generative semantics.

35Regarding honorification in general, see Harada (1976). On the issue of controller in subject-honorification, cf. Shibatani (1978). In general, it is considered that one of the conditions that triggers subject-honorification is the speaker's belief that Subject >> Speaker, where ">>" means "is socially higher than". Mikami (1972) further notes that Subject >> Hearer >> Speaker must hold for subject-honorification to come about. Shibatani (ibid.: 339-46) observes speaker-to-speaker variation in such conditions.

36Raising in relation to passive sentences is discussed in Appendix B.

37I am grateful to John Haig for having persuaded me to include discussion on this type of sentences.

38Since Japanese has only pseudo-cleft like construc-
tions, as opposed to English, which has both cleft and pseudo-cleft constructions, I will use "clefting" and "pseudo-clefting" interchangeably in the context of Japanese grammar. Regarding the retention of particles, see the reference in footnote 6.

39 The ni- version has a somewhat archaic overtone, the deletion of which, with the subsequent phonological change from -te to -de, will result in a colloquial style. (It may be phonologically more plausible to assume that the voicing of -te takes place prior to the deletion of ni-; I would like to remain non-committal on this issue.)

40 For a characterization of the lexicon within MG, see Dowty (1978a, 1978c).

41 See Siegel (1976) for details.

42 Cf. footnote 2.

43 Na is an inflected form of the copula da in the prenominal position. Our position is that adjectives that take the intension of CNs they modify and derive new CNs, i.e., CN//CN, are separate and different from predicate adjectives, whose lexical representation is given in footnote 2. We thus follow the doublet theory of adjectives.
of Siegel (1976). This decision of ours does not affect in any way other parts of the grammar, and it should perhaps be regarded as a tentative decision.

44 See footnote 1 for the tacit assumption regarding the interpretation of action verbs in general in the present tense.

45 See MP3, Chapter VII. The sub-star notation "*" in the example (73) has the usual significance. That is:

$$\delta_* = \text{def. } \lambda y \lambda x [\delta (\lambda P[P\{y\}]) (x)],$$

where $\delta \in \text{ME}_F(TV)$.

That is, $\delta_*$ denotes the relation between individuals $x$ and $y$ just in case $\delta$ denotes the relation between the individual $x$ and the property of properties of $y$; $\delta_*$ is thus a first-order 2-place predicate. Cf. Dowty (1978b: 179).
CHAPTER IV

QUANTIFIED CN'S

0. Introduction.

In this chapter we will see some basic syntactic and semantic properties of quantifiers in Japanese. The phenomena that have to do with binding and scope interactions with contexts like negation and intension will be discussed later in the next chapter since these require special considerations we have not examined yet. The first section is an overview of processes that derive T phrases. In section 1.0 we briefly discuss the difference between quantifiers in general and demonstrative adjectives. Section 1.1 outlines possible treatments of demonstrative adjectives. In section 1.2 we single out quantifier constructions we will be examining in this chapter. We discuss then one by one representative quantifiers in Japanese (2), followed by a discussion on Q-float in section 3. After characterizing Q-float in our grammar (3.0), we note some problems that will arise when Q-float and word-order scrambling are pitted against each other (3.1). Then in section 4 we take a look at scope interaction between quantifiers, and give syntax and semantics for this phenomenon. Section 5 is a summary of the chapter.
1. Derived Ts.

Observe the expressions in the braces:

1) a. \[
\begin{align*}
\text{Taroo} \\
\{ \text{ano hito} \\
\text{subete-no gakusei} \\
\text{takusan-no zyosei} \} \\
\text{-ga utau}
\end{align*}
\]

That man
Every student
Many women

"sing(s)."

b. \[
\begin{align*}
\text{Hanako-ga} \\
\{ \text{ano hito} \\
\text{subete-no gakusei} \\
\text{takusan-no zyosei} \} \\
\text{-o naguru}
\end{align*}
\]

Taroo
"Hanako hits that man every student many women"

c. \[
\begin{align*}
\text{Hanako-ga} \\
\{ \text{ano hito} \\
\text{subete-no gakusei} \\
\text{takusan-no zyosei} \} \\
\text{-to odcru}
\end{align*}
\]

Taroo
- 122 -
"Hanako dances with \{ Taroo \\
that man \\
every student \\
many women \} ."

Whether they are subjects (a), direct objects (b), or oblique terms (c), they are all alike in that they behave like MG Ts. The parallelism is more salient in Japanese, which does not have any number agreement (cf. (a)). In fact this parallelism is one of the strongest motivations for translating a proper noun like Taroo as a property set of the individual denoted by τ (see the reference in footnote 15, Chapter III). Since nouns like hito "person", gakusei "student", zyosei "woman" are CNs, we can regard expressions like ano "that", subete-no "every", and takusan-no "many" as expressions that take CNs to derive Ts. The generalization we wish to maintain is that only Ts can be followed by a particle (i.e., either a case particle or an adverbial particle) in Japanese. Consequently, the expressions in the braces in (1) all must translate into expressions of intensional logic of the same type since this correspondence between a syntactic category and a semantic type is functional. Of the four Ts in each pair of braces in (1), we call the first T as the basic T, i.e., either a PN or a pronoun, and the rest derived Ts. The expression represented by ano "that" we call a demonstrative adjective (DA), and the one exemplified by subete-no "every" and takusan-no "many" quantifiers (Q).
1.0. Qs and DAs.

Qs and DAs differ syntactically and semantically. Syntactically they are different in that Qs are easily floated by Q-float while DAs never float. Take (1b), for instance:

2) *(hito-o ano
Hanako-ga \{ gakusei-o subete \} naguru
\{ zyosei-o takusan \}

(lit.) "Hanako hits \{ student every \} ."
\{ women many \}

Similarly we cannot float *ano in (1a). Changing ano to *are "that" would not improve the situation at all:

3) a. *Hanako-ga hito-o are naguru
Hanako man that hit
"Hanako hits that man."
b. *hito-ga are utau
man that sing
"That man sings."

Lexically DAs form a unique and well-defined sub-system, which is usually known under the expression ko-so-a-do
taikēi "ko-so-a-do system", based on the initial sound(s)
of DAs that signify, respectively, speaker-proximity,
hearer-proximity, outside of speaker/hearer proximity, and
question forms for proximity orientation. Thus:

4) a. kono hon
   this book
   "this book" (i.e., the book in the speaker's proximity).

   b. sono hon
   that book
   "the/that book" (i.e., the book in the hearer's
   proximity).

   c. ano hon
   that book
   "that book" (i.e., the book (there) which is neither
   in the speaker's proximity nor in the hearer's proxi-
   mity).

   d. dono hon
   which book
   "which book"

Or when talking about places:

5) a. koko "here"

   b. soko "there (in the hearer's proximity)"

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c. asoko "(over) there that is not in speaker/hearer-proximity"

d. doko "where"

And there are many others of the similarly contrasted lexical items. (See Martin (1975) for more examples.)

Quantifiers, on the other hand, do not seem to form such a well defined lexical system, and this fact alone is enough to distinguish Qs from DAs.

Semantically, although both Qs and DAs take CNs to form derived Ts, they seem quite distinct, as may be obvious from the examples (4) and (5), in that while DAs must depend on deictic notions like speaker, hearer, etc. for their proper interpretations, this is never the case with Qs: regardless of the relative orientation between speaker and hearer, Qs can be uniquely interpreted.

For these reasons, it appears it is best to assume that Qs and DAs, if both were to be incorporated in our grammar, are syntactically different, that is to say, they receive separate categorial definition, and that their semantic type, since both take CNs to form Ts, is of the same type, their logical properties being reflected in their respective translations. Although deictic expressions
are not treated in our grammar, it is perhaps in order to briefly outline how such expressions may be treated\(^1\), deferring the discussion of syntax and semantics of several Qs to section 2.

1.1. DAs.

**Given:**

6) \textit{kono zyoyuu-wa zyogakusei dearu}  
\textit{this actress girl-student is}  
"This actress is a girl-student."

we take that this means something like "there is exactly one actress such that she is in the proximity of the speaker and that she is a girl-student." (Though (6) probably could also mean "Actresses in this group are (all) girl-students," we exclude the group reading from discussion.) In other words, we are taking that DAs commit us to the existence of exactly one individual such that it holds a certain deictic relation to a speaker or a hearer and that it has a certain attribute; in still other words, we take DAs to be a kind of Russellian definite description. Since notions like "speaker" or "hearer" obviously have to do with contexts of use, they may be regarded as indices on a par with
possible worlds and moments of time. We can then regard a sentence to be true if it is true with respect to an interpretation $\mathcal{A}$, a moment of time $j$, a possible world $i$, a speaker $d_1$, and a hearer $d_2$ ("d" for "deictic"). In order to ensure that DAs are deictically related, we can introduce first and second person pronouns, which are syntactically Ts and semantically of the type $<s,<e,t>,t>$. Translations may thus be given as follows:

7) **Lexicon**

\[
B_T = \{\ldots, [\text{watasi}]_T, [\text{anata}]_T\}
\]

("I", "you")

\[
B_{DA} = \{[\text{kono}]_{DA}, [\text{sono}]_{DA}, [\text{ano}]_{DA}\}
\]

where $DA = T/\CN$.

("this", "the/that", "that")

**Translation**

a. $[\text{watasi}]_T$ translates as $\lambda P^\forall P(i)$.

b. $[\text{anata}]_T$ translates as $\lambda P^\forall P(u)$.

c. $[\text{kono}]_{DA}$, $[\text{sono}]_{DA}$, $[\text{ano}]_{DA}$ translate as

$\lambda Q\lambda P^\forall P((\exists x)[ko'(x,i,u) \& Q(x)])$, 
$\lambda Q\lambda P^\forall P((\exists x)[so'(x,i,u) \& Q(x)])$, 
$\lambda Q\lambda P^\forall P((\exists x)[a'(x,i,u) \& Q(x)])$, respectively.

We take $i, u$ to be non-rigid designators, and furthermore
require that their respective denotation be always \( d_1, d_2 \): that is to say, \( F(i)<i,j,d_1,d_2> = d_1, F(u)<i,j,d_1,d_2> = d_2 \). The constants \( ko', so', a' \) are nonlogical constants, whose nature is for a lexicographer to characterize, but at least have to have following properties:

8) \( ko'(x,i,u) \) is 1 (or true) iff \( x \) is in the proximity of \( i \).

\( so'(x,i,u) \) is 1 iff \( x \) is in the proximity of \( u \).

\( a'(x,i,u) \) is 1 iff \( x \) is in the proximity of neither \( i \) nor \( u \).

Though I anticipate some difficulties in precisely characterizing notions like "in the proximity of" (just as it is difficult to precisely define what constitutes, say, "run" or "woman"), the above characterization will serve for our present informal discussion of DAs.

Given that Hanako is an actress at \( <i,j> \), then, the sentence:

9) \text{ watasi-wa zyoyuu da } \quad \text{I \quad actress \quad is} \quad \text{"I am an actress."} \quad \text{is true with respect to an interpretation A and the point } 

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Suppose Taroo is talking with Hanako at \(<i,j>\), and says:

10) \textit{anata-wa zyoyuu da}
    
    \textit{you actress is}
    
    "You are an actress."

(10) is true with respect to an interpretation \(\mathcal{A}\) and the point of reference \(<i,j,Taroo,Hanako>\) while (9) may not be true with this model unless Taroo is for some reason or other known to be an actress at \(<i,j>\). Suppose next Taroo and Hanako are talking with each other, and that there is exactly one book that is blue in the proximity of Taroo at \(<i,j>\). Then the sentence:

11) \textit{kono hon-wa aoi}
    
    \textit{this book blue}
    
    "This book is blue."

is true for an interpretation \(\mathcal{A}\) and the point of reference \(<i,j,Taroo,Hanako>\) while it is false for the same interpretation and the point of reference \(<i,j,Hanako,Taroo>\). It is perhaps better to distinguish the pair \(<i,j>\) and \(<d_1,d_2>\), as Montague does in UG (section 4)\(^4\), and call the latter the context of use, since the latter is part of all the other deictic determinants.
1.2. **Predicate Qs.**

Besides those Q-floated Qs (3.1), some Qs may appear in a nonprenominal position; particularly we find some Qs in the predicate position, as in:

12) a. **Hanako-o nagutta gakusei-wa ooi**

Hanako hit student many

"The students who hit Hanako are many."

b. **Boo-o mita hito-wa sukunai**

Bo saw person few

"The people who saw Bo are few."

Though some relation between these and the following cannot be denied:

13) a. **ooku-no gakusei-ga Hanako-o nagutta**

many student Hanako hit

"Many students hit Hanako."

b. **kazusukunai hito-ga Boo-o mita**

few person Bo saw

"Few people saw Bo."

it is not at all clear that this relationship should be captured syntactically. Note that (12) is not a clefted version of (13); (12) involves a relative clause, and
hence the syntactic change one has to effect from (13) to (12) will have to be carried out in total negligence of relative clause formation (cf. (70), Chapter III). Such a rule is at most dubious. We should perhaps generate sentences like (12) as basic ones. Since sentences like the following are not grammatical:

14) a. *Taroo-wa ooi

   Taroo  many

   "*Taroo is many."

   b. *Hanako-wa sukunai

   Hanako  few

   "*Hanako is few."

we should perhaps consider Qs in this position as being group-level Qs; that is, Qs that semantically combine with those nouns that signify a group of individuals and assign a certain cardinality to such a group. This is most clear when we have numerals in the predicate position, with the aid of a copula.

15) a. Hanako-o nagutta gakusei-wa yonin da

   Hanako  hit  student  four  is

   "The students who hit Hanako are four (in number)."

   b. Boo-o mita hito-wa gonin da

   Bo  saw  person  five  is

   "The people who saw Bo are five (in number)."
Such a position would require, however, a proliferation of syntactic categories: for each individual-level CN, for instance, we need a group-level CN, and for each individual-level IV, we need a group-level IV, etc. This issue of individual- vs. group-level also arises in prenominal position:

16) a. takusan-no hito-ga atumatta
   many          person  gathered
   "Many people gathered."

b. *Taroo-ga atumatta
   Taroo        gathered
   "*Taroo gathered."

c. takusan-no hito-ga kita
   many         person  came
   "Many people came."

d. Taroo-ga kita
   Taroo        came
   "Taroo came."

Our syntactic categories may thus have to be more than doubled in order to treat these cases properly. For a grammar of these types of sentences, see Bennett (1975: Chapters 3, 4). With this rather inconclusive note, I leave off this discussion, noting that sentences like (12) are outside the scope of our present inquiry.
2. Basic Qs.

Before discussing some representative quantifiers, let me here give the syntactic rule that combines a Q and a CN to derive a T, with its translation:

17) S8. (Q-CN)

If $\alpha \in P_Q$, $\beta \in P_{CN}$, then $F_6(\alpha, \beta) \in P_T$, where

$$F_6(\alpha, \beta) = [\alpha \text{ no } \beta]_T.$$

T8. If $\alpha \in P_Q$, $\beta \in P_{CN}$, $\alpha$, $\beta$ translate as $\alpha'$, $\beta'$ respectively, then $F_6(\alpha, \beta)$ translates as $\alpha'(\beta')$.

S8 produces a structure like:

18)

```
   T
  /\  \
 Q  no  CN
  /    \
 $\alpha$  $\beta$
```

Note that the categorial definition of Q is $(t/IV)/CN$ though we continue using the abbreviated syntactic category Q.
2.0. **Minna.**

Given that (a) is true, (b) and (c) or any other instantiation follow.

19) a. *minna no hito-ga odotta*

    *every person danced*

    "Every person danced."

b. *Hanako-ga odotta*

    "Hanako danced."

c. *Taroo-ga odotta*

    "Taroo danced."

eetc.

Accordingly, we assign the following translation to *minna*:

20) \([minna]Q \rightarrow \lambda P \lambda Q (\forall x) [\forall P(x) \rightarrow \forall Q(x)]\).

(19a) is then produced in the following manner:

21) \([[[minna]Q \rightarrow [hito]_{CN}]_T \rightarrow [odoru]_V]_t : S2\)

\([[[minna]Q \rightarrow [hito]_{CN}]_T : S8 [odoru]_V]_IV\)

\([minna]Q [hito]_{CN}\)

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The translation proceeds as follows:

22)

1. \([\text{odoru}]_V\) \(\text{IV} \Rightarrow \text{odoru}'\)
2. \([\text{hito}]_{\text{CN}} \Rightarrow \text{hito}'\)
3. \([\text{minna}]_Q \Rightarrow \lambda P \lambda Q(\forall x)[\forall P(x) \rightarrow \forall Q(x)]\)
4. \(\text{minna no hito}^9 \Rightarrow\)
   \(\lambda P \lambda Q(\forall x)[\forall P(x) \rightarrow \forall Q(x)]('\text{hito}')\) \(\text{:T8 (2,3)}\)
5. \(\rightarrow \lambda Q(\forall x)[\forall '\text{hito}'(x) \rightarrow \forall Q(x)]\) \(\text{:\(\lambda\)-conversion}\)
6. \(\rightarrow \lambda Q(\forall x)[\text{hito}'(x) \rightarrow \forall Q(x)]\) \(\text{:Down-Up}\)
   \(\text{Cancellation}\)
7. \(\text{minna no hito-ga odoru} \Rightarrow\)
   \(\lambda Q(\forall x)[\text{hito}'(x) \rightarrow \forall Q(x)]('\text{odoru}')\) \(\text{:T2 (1,6)}\)
8. \(\rightarrow (\forall x)[\text{hito}'(x) \rightarrow \forall '\text{odoru}'(x)]\) \(\text{:\(\lambda\)-conversion}\)
9. \(\rightarrow (\forall x)[\text{hito}'(x) \rightarrow \text{odoru}'(x)]\) \(\text{:Down-Up}\)
   \(\text{Cancellation}\)

Alongside (19a), we have a sentence like the following as its paraphrase:

23) \(\text{minna-ga odotta}\)
   
   \(\text{every danced}\)
   
   "Everyone danced."

Here the Q apparently behaves like a T, but it appears we do not have to posit a separate T \(\text{minna}\). The most natural
course to take would be to derive (23) transformationally from (19a), which may be stated as:

24) SS2. (hito-deletion)

\[
\begin{array}{c}
X, Q, \text{no [hito]} CN, Y \\
1, 2, 3 \quad , 4 \quad \rightarrow \\
1, 2, \emptyset \quad , 4
\end{array}
\]

where \( Q = [\text{minna}] Q \).

TT2. Identity mapping.

SS2 is responsible for the ambiguity in:

25) Taroo-ga minna no hon-o yomu

Taroo every no book read

This may be glossed either as (a) or (b):

   b. Taroo reads everyone's book.

In the reading (a), \textit{minna} is a Q that combines with the CN \textit{hon} "book", while in (b) \textit{minna} has first combined with \textit{hito} "person" to form a T phrase, which then combined with \textit{hon} "book", forming a genitive construction, with the subsequent deletion of \textit{hito} "person" by SS2. Prior to such deletion,
the (b) reading of (25) was:

27) Taroo-ga minna-no hito no hon-o yomu
    Taroo every person gen. book read
    "Taroo reads everyone's book."

The genitive no may be regarded as an expression that takes a T (minna-no hito "everyone" in (27)) and a CN (hon "book") to derive another term (minna-no hito no hon "everyone's book").

2.1. Subete.

Subete is like minna when it modifies a CN as a Q; if (a) below is true, so are (b), (c), etc.

28) a. subete-no hito-ga odoru
    all person dance
    "All people dance."

b. Boo-ga odoru
    "Bo dances."

c. Taroo-ga odoru
    "Taroo dances."

etc.
We can thus give the same translation to *subete* as *minna*.

But now observe:

29) a. ?Taroo-wa subete-o aisiteiru
    Taroo all love
    "Taroo loves all."

    b. Taroo-wa minna-o aisiteiru
    Taroo every(one) love
    "Taroo loves everyone."

If we regard *aisiteiru* "love" as a human relationship between two individuals, (a) above is awkward compared to (b). Similarly, with an expression that is typically human, the same contrast obtains:

30) a. ?subete-ga kanasin-de-iru
    all feel sad
    "All feel sad."

    b. minna-ga kanasin-de-iru
    every(one) feel sad
    "Everyone feels sad."

On the other hand, where a predicate pragmatically selects objects or something other than human, *subete* seems better suited:
31) a. subete-ga kara da
   all empty
   "All are empty."

b. ?minna-ga kara da
   every(one) empty
   "Everyone is empty."

This is probably because subete, when it acts alone as a T,
means not simply "everyone", as minna does, but "everything".
While a high degree of discourse deletion permitted in Japa­
nese often obscures this, I believe this observation is
essentially correct, and would like to propose that (32)
below, for instance, "underlies" (31a).

32) subete no mono-ga kara da
   all thing empty
   "All things are empty."

Should the proposed constant mono be inadequate, I guess we
have to resort to the philosopher's vocabulary and use
zittai, which I believe corresponds to the notion "entity".
Since mono "thing" can designate both humans and nonhumans,
with somewhat derogatory flavor when used in talking about
humans (perhaps because of dehumanization mono seems to in­
cur most of the time), it is any way a good candidate for a
constant in the deletion transformation that generates (31a)
from (32). Mono in writing is written in two ways, "著" and "物", depending on whether the "thing" is human or not. Since mono is syntactically a CN, we let it denote a set of entities. Unfortunately mono-ood is hardly a piece of knowledge of our daily life experience, and we let it have a philosophical meaning and denote a set of objects that are identical to themselves following Montague's translation of "entity".\textsuperscript{12}

33) \([\text{mono}]_{\text{CN}}\) translates as \(\lambda x [x = x]\).

The proposed transformation that derives (31a) from (32) is:

34) SS3. (mono-deletion)

\[
\begin{array}{c}
X, Q, \text{no } [\text{mono}]_{\text{CN}}, Y \\
1, 2, 3, 4 \quad \rightarrow \\
1, 2, 0, 4 \\
\text{where } Q = [\text{subete}]_Q.
\end{array}
\]

TT3. Identity mapping.

The generation of (32), for instance, parallels (22), and there is nothing new structurally. The translation for it will come out as being equivalent to:

35) \((Vx)[x = x \rightarrow \text{kara}'(x)]\).
2.2. **Dareka.**

*Dareka* is a strange word; unlike *minna* or *subete*, this can never modify a CN with the syncategorematically introduced *no*, and yet it behaves like a quantified expression as we will see when we get to the section on quantifier interaction. It may be translated as "someone" in English. Compare:

36) a. *dareka-ga kita*
   
   someone came
   
   "Someone came."

   b. *dareka-no gakusei-ga kita*
   
   i. "Some student came."
   ii. "Someone's student came."

Thus, if alone, *dareka* "someone" behaves like a quantified noun phrase, while if followed by *no*, it can never function as Q: (36b) is ok only in the second reading, i.e., the *no* is a genitive *no* (cf. footnote 10). These features of *dareka* "someone" would follow if we treated it as a member of $B_T$, giving the following translation:

37) $\lambda Q(\exists x)[hitoe'(x) \& ^*Q(x)]$.

This translation would guarantee that *dareka* means "there
is at least one individual such that he is a person and that he has the property Q." Such a translation would also predict that dareka "someone" would participate in scope interaction with other quantifiers. While there is a certain amount of appeal in this approach, it is perhaps to be rejected because of the following relatively neglected paradigm.

38) i. a. **dareka-ga kuru**
   
   someone come
   "Someone comes."
   
   b. Hanako-wa dareka-o sagasi-te-iru
       Hanako someone is looking for
       "Hanako is looking for someone."

   ii. a. **dareka hito-ga kuru**
       someone person come
       "Someone comes."
       
       b. Hanako-wa dareka hito-o sagasi-te-iru
           Hanako someone person is looking for
           "Hanako is looking for someone."

In other words, if there is no intervening no, dareka may take a CN to form a T. And, as was the case with minna "every", the deletion of hito "person" gives rise to dareka acting alone as a T (cf. (a) and (b) in (i) and (ii) above), resulting in paraphrases.13 There seems to be a certain pragmatic factor controlling the relative acceptability of
dareka CN sequence: it appears to me that this is more acceptable, the longer the CN. Thus:\footnote{14}

\begin{enumerate}
\item a. Hanako-wa dareka huransugo-o hanaseru hito-o
   \hspace{1cm} Hanako someone French can speak person
   sagasi-te-iru
   \hspace{1cm} is looking for
   "Hanako is looking for someone who can speak French."
\item b. Ziroo-wa dareka atama-no-ii gakusei-to sun-de-iru
   \hspace{1cm} Ziroo someone bright student-with is living
   "Ziroo is living with a bright student."
\end{enumerate}

As with \textit{minna} "every(one)"\footnote{15}, I would like to propose that sentences like (38i) be produced via (38ii) by means of hito-deletion. This requires certain modifications of S8 and SS2 ((17) and (24)), and we now replace them with the following new formulations:\footnote{15}

\begin{enumerate}
\item S8. (Q-CN)
   \begin{enumerate}
   \item If $\alpha \in P_Q$ and $\alpha \neq \underline{\text{dareka}}_Q$, $\beta \in P_{CN}$, then $F_6(\alpha, \beta) \in P_T$, where $F_6(\alpha, \beta) = [\alpha \text{ no } \beta]_T$.
   \item If $\alpha = \underline{\text{dareka}}_Q$, $\beta \in P_{CN}$, then $F_7(\alpha, \beta) \in P_T$, where $F_7(\alpha, \beta) = [\alpha \beta]_T$.
\end{enumerate}
\end{enumerate}
SS2. (hito-deletion)

\[ X, Q, (\text{no}) \text{ hito}, Y \]

\[ 1, 2, \quad 3 \quad , \quad 4 \quad \longrightarrow \]

\[ 1, 2, \quad \emptyset \quad , \quad 4 \]

where i) no \neq \text{genitive no}, \text{i.e.,}

\[ \text{no} \in P(T//CN)/T \quad (\text{cf. footnote 10}) \]

ii) Q = \text{minna or dareka.}

One might object that an expression like:

41) \text{dareka gakusei}

\text{some(one) student}

"some student"

is a kind of a relative clause somewhat resembling the English:

42) \text{someone who is a student.}

But this position is untenable in Japanese, since 1) no verb appears in the sequence \text{dareka gakusei} "some(*one) student", and 2) the order one would expect in Japanese, if this were indeed a kind of a relative clause, is \text{gakusei dareka, which is impossible:}
43) a. *gakusei dareka-ga kita
   student some(one) came
   "Some student came."

   b. *Hanako-wa gakusei dareka-to hanasita
      Hanako student some(one)-with spoke
      "Hanako spoke with some student."

Instead one would have to say:

44) a. gakusei no dareka-ga kita
    student is some(one) came
    "Someone who was a student came."

   b. Hanako-wa gakusei no dareka-to hanasita
      Hanako student is some(one)-with spoke
      "Hanako spoke with someone who was a student."

which indeed contain relative clauses (note the verb no and the order gakusei and dareka take). Note further that it would be highly atypical for a specifier (à la Chomskian X theory) to follow the specified in the nominal structure of Japanese.

Another conjecture that the sequence like (41) might be an appositional juxtaposition is equally implausible. Aside from the peculiarity of setting up an appositional structure solely for the sequence dareka CN and the
accompanying difficulty of giving it a proper translation, this position, as well as the first one, cannot account for the Q-like nature of dareka as appears in this sequence. Particularly important is the Q-floatability (cf. section 3.0) of dareka as well as other Qs.

45) a. (= Q-floated version of (38iia))
   
   hito-ga dareka kuru
   person some(one) come
   "Someone comes."

   b. (= Q-floated version of (38iib))
   
   Hanako-wa hito-o dareka sagasi-te-iru
   Hanako person some(one) is looking for
   "Hanako is looking for someone."

   c. (= Q-floated version of (39a))
   
   Hanako-wa huransugo-o hanaseru hito-o dareka
   Hanako French can speak person some(one)

   sagasi-te-iru
   is looking for
   "Hanako is looking for someone who can speak French."

Furthermore, we note that dareka floats only from 1's and 2's, which is a general condition imposed on Q-float in Japanese (cf. section 3.0 for further details):
46) a. (= (45a))

b. (= (45b))

c. (= (45c))

d. (= Q-floated version of (39b))

*Ziroo-wa atama-no-ii gakusei-to dareka sun-de-iru
Ziroo bright student-with some(one) is living
"Ziroo is living with a bright student."

Considerations like these favor our analysis of dareka as a Q; accordingly its translation is\textsuperscript{17}:

47) [dareka]\textsubscript{Q} translates as $\lambda P \lambda Q(\exists x)[\forall P(x) \land \forall Q(x)]$.

Given hito-deletion (SS2 in (40)), (38ia) and (38iia) will come out as having both of them the following translation:

48) $(\exists x)[\text{hito}'(x) \land \text{kuru}'(x)]$.  

(hito "person", kuru "come")

The generation of these sentences and their translations, \textit{mutatis mutandis}, parallel (21) and (22).
2.3. Numeric expressions.

Numeric expressions, containing numerals, are literally quantifiers, indicating the exact size of a set of individuals. They too behave like ordinary Q's in Japanese in that Q-float can float them:

49) i. a. sannin-no zyoyuu-ga odoru
   three actresses dance
   "Three actresses dance."

   b. zyoyuu-ga sannin odoru
      actresses three dance
      "Three actresses dance."

ii. a. Hanako-ga sannin-no kodomo-o unda
      Hanako three child bore
      "Hanako bore/had three children."

   b. Hanako-ga kodomo-o sannin unda
      Hanako child three bore
      "Hanako bore/had three children."

As we have pointed out at the end of section 1.2, we do not include any treatment of a group-level reading, and hence neither the following sentence nor its reading is produced in our fragment:
50) sannin-no kodomo-ga atumatta
    three    child    gathered
    "(A group of) three children gathered."

Hence the ambiguity that is actually there in (49ia) and (49iia) is disregarded. (49iia), for instance, means either "Hanako gave birth to three children on separate occasions," or "Hanako gave birth to triplets." Though this distinction of group vs. individual seems to have certain relevance to Q-float as we will see later, we disregard throughout the dissertation the group-level reading due to the considerations on p.133. For the treatment of group- as well as individual-level expressions, see the reference cited at the end of section 1.2.

Japanese numeric expressions, when functioning as Qs, are very troublesome from a syntactic point of view in that they change forms according to what CNs they modify. A random list of such forms according to the CN is:

51) people    animals    books    cars    boats
    1 hitori    ippiki    issatu    itidai    issoo
    2 hutari    nihiki    nisatu    nidai    nisoo
    3 sannin    sanbiki    sansatu    sandai    sansoo
    4 yonin    yonhiki    yonsatu    yo(n)dai    yonsoo
      .          .         .     yo(n)dai    yonsoo
    n n-nin    n-hiki    n-satu    n-dai    n-soo
      .          .         .           .     .
The productive pattern appears in the n-th row; the problem is how to enter numeric expressions in the lexicon. Ideally we should perhaps start with a numeral plus CN it modifies, then copy some feature, say, [+human], [+animal], [+book], etc. of a CN to the right of such a numeral, and let morphological spelling rule take care of each form, together with suppletive forms (cp. the top and the second left corners), leaving the phonological alternation to phonology. Thus, sanbiki no inu "three dogs" may be produced in the following fashion:

52) a. ..... san no inu ..... 
   three dog
   b. ..... san no inu ..... (feature copying) 
   [+animal]
   c. ..... san-hiki no inu ..... (morphological spelling)
   d. ..... sanbiki no inu ..... (phonological interpretation)

(The last step (d) is not "purely" phonological; for instance, the form san-kai may be realized as either sankai or sangai according as it means "three times" or "third floor".) Though I feel this is the right approach, I will make below a simplifying assumption that every numeric expression, like in (51), is entered as it is in the lexicon, and that each row of (51) receives the same translation. Given this assumption, each
row of (49) translates as follows:

53) 1. \( \Rightarrow \lambda P \land Q(\exists x)[P(x) \land Q(x)] \)
2. \( \Rightarrow \lambda P \land Q(\exists x)[P(x) \land Q(x)] \)
3. \( \Rightarrow \lambda P \land Q(\exists x)[P(x) \land Q(x)] \)
4. \( \Rightarrow \lambda P \land Q(\exists x)[P(x) \land Q(x)] \)
    .
    n. \( \Rightarrow \lambda P \land Q(\exists nx)[P(x) \land Q(x)] \)

The new quantifier in intensional logic (\(\exists nx\)) is separate from (\(\exists x\)), and is accordingly interpreted differently. I follow Bennett (1975) in stating its truth condition; in general, (\(\exists nx\))\(\phi\) (\(\phi \in P_t\)) is true if the cardinality of the set \(\lambda x\phi\) is \(n\). For details, see the Fragment, Chapter VII (or Bennett (ibid., Chapter 4)).

Given this translation, (a) below will receive the translation (b), which is equivalent to (c) à la (22).

54)  a. sannin-no zyoyuu-ga odoru  
        three actress dance
"Three actresses dance."

b. \( \lambda P \land Q(\exists 3x)[P(x) \land Q(x)](\text{'zyoyuu'})(\text{'odoru'}) \)

c. (\(\exists 3x\)[zyoyuu'(x) & odoru'(x)]).
2.4. **Relative size Qs.**

Even given an interpretation $A$, a point of reference $\langle i,j \rangle$, and $A$-assignment (of values to variables) $g$, some quantifiers cannot be interpreted properly:

55) a. **Hanako-wa takusan-no kodomo-o sodateta**  
   Hanako many child raised  
   "Hanako raised many children."

   b. **takusan-no kodomo-ga ziko-de sinu**  
      many child accident-in die  
      "Many children die in an accident."

   c. **Taroo-wa takusan-no zyosei-to tukiat-te-iru**  
      Taroo many woman-with is going along  
      "Taroo is going along with many women."

In each case, the cardinality of the set $\lambda x \text{CN'}(x)$ ($\text{CN} = \text{kodomo}$ or $\text{zyosei}$) seems to differ significantly. And this is not simply a matter of context, for as Bennett (1975: 103) notes, two occurrences of *takusan* in a single sentence may signify different sizes of individuals, as in:

56) **takusan-no dansei-ga takusan-no zyosei-o aisiteiru**  
   many man many woman love  
   "Many men love many women."
Thus, while *takusan-no dansei* "many men" may include most of the men living on the earth, *takusan-no zyosei* "many women" probably include only a handful in the above example. There must be some logic in this kind of "vague talk", too although precisely how such logic may be formulated is far from clear. For want of a better approach, let us follow Bennett (1975) and resolve the vagueness of sentences like (55) or (56) by considering their truth (under an interpretation) "not only relative to a point of reference but also relative to a precise specification of what constitutes (p.102)" *takusan* "many", a nonnegative integer. Similarly with other quantifiers like *syoousu* "a small number", *tasuu* "a large number", etc. A specification specifies what constitutes *syoousu* "a small number" and *takusan* "many" or its variant *tasuu* "a large number". Thus a specification in our overall grammar will be a 2-place sequence of (nonnegative) integers. If $s$ is a specification, then $s$ is:

57) $<s(0),s(1)>$. 

We require furthermore that the following always hold:

58) $2 \leq s(0) \leq s(1)$

Since one specification is not enough because of examples like (56), we relativize the specification, as Bennett does,
according to a frame of reference, or a frame of specification as Bennett calls it (p.103). In most cases we can equate such frame of reference with the context of use, but as (56) shows, this is not entirely identical with it. For convenience we may regard such frame of specification to be a nonnegative integer. To effect this two-step relativization of truth of sentences having Qs of relative size expressions, we introduce a function h, which may be called plurality assignment again following Bennett (1975), whose domain is the set of all frames of reference or specification (which, we are taking, for convenience, to be integers) and whose range is a set of specifications as defined above. Our plurality assignment h assigns to the nth frame of reference the specification h(n) or the 2-place sequence of nonnegative integers:

59) \(<h(n)(0), h(n)(1)>\).

Naturally the parallel of (58) is to be required of h, too. Suppose that we are talking about men in general and that we associate with this a frame of reference by means of 3, then h would give, for instance, the following integers as values for h(3)(0) and h(3)(1), assuming that the number of men living on the earth is two billion:

60) \(<50,000,000, 1,000,000,000>\).
Assume further that in this frame, we are talking about how many women a man may love and associate with this a frame of reference by the number 9. Then our plurality assignment \( h \) gives the following value for \( h(9)(0) \) and \( h(9)(1) \), assuming some common knowledge as to how many women a man may love:

61) \(<3,10>\).

Given these, we take that (56) is true iff more than 1,000,000,000 men love more than 10 women at an index \( <i,j> \). \(^{19}\)

With the same frames of reference, the following sentence:

62) takusan-no dansei-ga syoosuu-no zyosei-o aisiteiru
"Many men love a small number of women."

is true iff more than 1,000,000,000 men love less than 3 women. For exact specification of truth conditions, see the Fragment, Chapter VII.

Some representative relative size Qs are then translated as follows\(^ {20} \):

63) \([\text{syoosuu}]_Q \rightarrow \lambda Q \lambda P(S^n x)[\forall Q(x) \& \forall P(x)]\).

\([\text{takusan}]_Q \rightarrow \lambda Q \lambda P(T^n x)[\forall Q(x) \& \forall P(x)]\).

\([\text{tasuu}]_Q \rightarrow \lambda Q \lambda P(T^n x)[\forall Q(x) \& \forall P(x)]\).
The superscript "n" indicates the frame of reference or specification as described above.

3. Qs afloat.

3.0. Q-float.

As in English, Japanese Qs may float away from their original positions; unlike English, though, generally speaking, any Q whatsoever may be floated, and in either direction to boot. Given the sentence:

64) Hanako-ga sannin-no kodomo-o sodateta
    Hanako three child raised
    "Hanako raised three children."

any of the following three sentences is well-formed:

65) a. Hanako-ga sannin kodomo-o sodateta
    b. Hanako-ga kodomo-o sannin sodateta
    c. sannin Hanako-ga kodomo-o sodateta

Basically Q may be floated from either subject or direct object, and one position maintains that it is the grammatical relations 1 and 2 that trigger Q-float, based...
on observations like:

66) i. (subject)
   a. sannin-no kodomo-ga asondeiru
      three child is playing
      "Three children are playing."
   b. kodomo-ga sannin asondeiru

ii. (direct object)
   a. Hanako-ga sannin-no kodomo-o nagutta
      Hanako three child hit
      "Hanako hit three children."
   b. Hanako-ga kodomo-o sannin nagutta

iii. (indirect object)
   a. Ziroo-ga sannin-no kodomo-ni okane-o yatta
      Ziroo three child money gave
      "Ziroo gave money to three children."
   b. *Ziroo-ga kodomo-ni sannin okane-o yatta

iv. (non-terms)
   a. Hanako-ga sannin-no kodomo-to asondeiru
      Hanako three child-with is playing
      "Hanako is playing with three children."
   b. *Hanako-ga kodomo-to sannin asondeiru
   c. Hanako-ga sannin-no kodomo-kara okane-o morau
      Hanako three child-from money receive
      "Hanako receives money from three children."
   d. *Hanako-ga kodomo-kara sannin okane-o morau
Another position maintains that Q's may be floated only from Ts that are followed by the particle -ga or -o, and marginally -ni (and more marginally -e). Since there are certain verbs that take dative subjects (i.e., subjects marked by the particle -ni, whose unmarked grammatical function is to indicate indirect object (cf. Class 5 in table (16), Chapter II), a crucial example that supports this position is:

67) a. kono kurasu-de-wa sannin-no kodomo-ni eigo-ga wakaru
    in this class three child English understand
    "In this class, three children understand English."
    b. *kono kurasu-de-wa kodomo-ni sannin eigo-ga wakaru

Since wakaru "understand" optionally takes nominative subject, this position would predict that the following are both grammatical.

68) a. kono kurasu-de-wa sannin-no kodomo-ga eigo-ga wakaru
    b. kono kurasu-de-wa kodomo-ga sannin eigo-ga wakaru

Though I feel the second sentence above is a little awkward, I think the observation is basically right, and Q-float should probably be formulated along this line. Note further that while opinions differ as to the status of the q-marked T below (cf. Jacobson (1979)), it certainly triggers Q-float.
69) a. Taroo-wa mittu-no ooki-na miti-o aruita
   Taroo three wide road walk
   "Taroo walked three wide roads."

b. Taroo-wa ooki-na miti-o mittu aruita
c. Taroo-wa mittu ooki-na miti-o aruita
d. mittu Taroo-wa ooki-na miti-o aruita

We will for the purpose of our presentation follow the second approach and say that Q may be floated from within a T that is followed either by -ga or by -o.

Another aspect of Q-float that is not very clear is the fact that given:

70) a. kinoo watasi-wa sannin-no zyoyuu-o mita
    yesterday I three actress saw
    "Yesterday I saw three actresses."

b. kinoo watasi-wa zyoyuu-o sannin mita

while (a)'s preferred reading is "I saw a group of three actresses yesterday," with a slightly less preferred reading of "I saw (individually) three actresses yesterday," (b) strongly favors the second reading. Though this aspect of Q-float needs to be accounted for, I take it that it is outside the domain of our grammar since, preferred or not, the two readings are still there in both (a) and (b). As
we said earlier, we deal only with individual-level CNs and predicates; hence the ambiguity is not even representable in our grammar.

Another related feature that needs explanation is the observation that given:

71) a. Hanako-wa mittu-no mikan-o tabeta
    Hanako three tangerine ate
    "Hanako ate three tangerines."

    b. Hanako-wa mikan-o mittu tabeta

pitted against each other, (a) is better glossed as "Hanako ate the three tangerines," while (b) may be better rendered as "The number of tangerines Hanako ate was three," or "Hanako ate tangerines - three of them." At present I do not know how to handle this problem of specificity; maybe when we enlarge our grammar to include the treatment of group-level CNs, (a) could be given as one of its translations a reading something like "Hanako ate the group of three tangerines." Until then the problems mentioned regarding (70) or (71) remain completely neglected.
3.1. Q-float and Scrambling.

While Qs may be rather freely floated to the right or to the left, such floating is not completely free (In the following example, each single line corresponds to a daughter constituent of t.):

72) a. hutari-no dansei-ga sannin-no zyoyuu-o mita
   two men three actresses saw
   "Two men saw three actresses."
   b. hutari-no dansei-ga sannin zyoyuu-o mita
   c. hutari-no dansei-ga zyoyuu-o sannin mita
   d. ?sannin hutari-no dansei-ga zyoyuu-o mita
   e. hutari dansei-ga sannin-no zyoyuu-o mita
   f. dansei-ga hutari sannin-no zyoyuu-o mita
   g. *dansse-ga sannin-no zyoyuu-o hutari mita
   h. hutari dansei-ga sannin zyoyuu-o mita
   i. hutari dansei-ga zyoyuu-o sannin mita
   j. ?sannin hutari dansei-ga zyoyuu-o mita
   k. dansei-ga hutari sannin zyoyuu-o mita
   l. *dansse-ga sannin hutari zyoyuu-o mita
   m. *dansse-ga sannin zyoyuu-o hutari mita

The generalization seems to be that whenever a Q is floated, it may not hop over another Q or a T that contains another Q. This generalization seems to hold even when a Q is floated
over an oblique T that contains a Q (again using a single line to indicate a daughter constituent of t):

73) a. hutari-no dansei-ga sannin-no zyoyuu-to odotta
   two men three actresses-with danced
   "Two men danced with three actresses."

b. hutari dansei-ga sannin-no zyoyuu-to odotta

c. dansei-ga hutari sannin-no zyoyuu-to odotta

d. *dansei-ga sannin-no zyoyuu-to hutari odotta

As opposed to Q-float, Scrambling, which scrambles daughter constituents of t, or t-daughters (save the verb), may interchange the order of t-daughters that contain Qs; thus from (72a) and (73a), we may get (a) and (b) below via Scrambling:

74) a. sannin-no zyoyuu-o hutari-no dansei-ga mita
   three actresses two men saw
   "Two men saw three actresses."

b. sannin-no zyoyuu-to hutari-no dansei-ga odotta
   three actresses-with two men danced
   "Two men danced with three actresses."

Facts like these may indicate that Q-float and Scrambling are separate rules. But it appears to me that the similarities of operations involved are overwhelming; both the
so-called Q-float and Scrambling effect criss-crossing of t-daughters (save the verb); the domain of application is complementary; Q-float moves a Q around, placing it as a t-daughter somewhere, while Scrambling moves around t-daughters other than Q (save of course V). Normally, given the ordering of rules, this complementary domains of application of rules would be effected by ordering Scrambling before Q-float so that when Scrambling applies, there is no Q that is a daughter of t. Since we do not assume any ordering of rules in our grammar, this kind of approach is out of question. Rather, we regard Q-float and Scrambling a single rule; Q-float is a special case of Scrambling, i.e., it is a scrambling of Q and some other t-daughter, with a special condition to block sentences like the starred and queried ones in (72) and (73). In order to feed into such Scrambling, we need, instead of the so-called Q-float, a rule that makes a Q that is inside a T phrase a daughter constituent of t. Though this operation is nothing like Q-float, we save the name and call this extraction transformation Q-float, which may be stated as follows:

75) SS4. (Q-float)
\[
X, e, Q, \text{[no]}, \text{CN}, \left\{ \begin{array}{c} ga \\ 0 \end{array} \right\} Y
\]

\[
1, 2, 3, 4, 5, 6 \quad \longrightarrow
\]

\[
1, 3, \emptyset, \emptyset, 5, 6
\]

where \(3+4+5 = T\).

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TT4. Identity mapping.

SS4, for instance, converts (a) below to (b).

76) a.

```
    t
   / \  \
  1   2
 / \   /
T   T  V
```

Hanako ga sannin no otoko o nagutta

(Hanako three man hit)

"Hanako hit three men."

b.

```
    t
   /  \
  1   Q
 /     /
T     T
```

Hanako ga sannin otoko o nagutta

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Our generalized Scrambling is:

77) SS5. (Scrambling)

\[ X, A, B, Y V \]
\[ 1, 2, 3, 4 \]
\[ 1, 3, 2, 4 \]

where i) \( A, B \) are t-daughters, and

ii) if \( A \) (or \( B \)) is Q, \( B \) (or \( A \))
does not contain Q.27

TT5. Identity mapping.

SS5 thus converts (76b), for instance, to either of the following:

78) a. Hanako-ga otoko-o sannin nagutta
    b. sannin Hanako-ga otoko-o nagutta

SS5 also generates all the examples (b) - (m) except the starred or queried sentences in joint operation with SS4 from (72a).

Although I feel our approach is basically correct, our rules (and for that matter, any approach with rule ordering) overgenerates. Take, for instance, (72h). SS5 may operate on this sentence and derive:
79) *hutari sannin dansei-ga zyoyuu-o mita

    two    three man    actress saw

"Two men saw three actresses."

which is ungrammatical. But the source sentence (72h) meets the structural description of Scrambling since it may be partitioned as follows.

80)  

Since A (dansei ga) does not contain any Q, it and B (sannin), which is a Q, may be interchanged, yielding (79), which is ungrammatical. Clearly the condition of SS5 is global such that no Q may be floated over a constituent which at some stage of derivation has a Q inside it. Since we do not want to have anything like global derivational
constraints in our grammar, we resolve this problem by elaborating upon the condition (ii) above:

81) ii) if A (or B) is Q, then B (or A) may not contain any Q, nor is there any t-daughter Q in Y (or X).

The effect of this elaboration may be seen from the proper analysis (80), where, though A does not contain any Q, there is a t-daughter Q (i.e., hutari) in X; hence B may not be scrambled with respect to A.

Though we have limited the sentence final predicate to V in Scrambling, we should in the long run include other predicates here, too, i.e., A, CN C, and T C.

It is not clear why Japanese allows such a full-fledged Q-float (i.e. our Scrambling), as compared with English. One of the factors it appears to me is the form the T takes after Q-float. Thus:

82) i. a. All the children came.
    b. The children all came.
   
ii. a. Every child came.
    b. *Child every came.

Note that in the (b) version, if you leave out the
quantifier, (ib) still yields a grammatical sentence while (iib) does not:

83) ib'. The children came.
    iib'. *Child came.

Although this does not explain anything as to why English some, for instance, does not float (or any other non-universal quantifier), the factor certainly seems to have some relevance since Japanese is a language that allows bare CNs to act freely as Ts (cf. Chapter VI) while English does not have a sentence like (83iib') in the set of well-formed sentences. 29

4. Scopes.

Qs interact with respect to their relative scopes; the phenomenon itself is now old and familiar enough in the transformational literature as well as in logic. (84), for instance, has two readings, (85a) and (85b), the former being usually the preferred reading over the latter.

84) minna-no dansei-ga dareka zyosei-o aisiteiru
    every man some woman love

"Every man loves some woman."

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85) a. For every man there is some woman he loves.
   b. There is some woman every man loves.

Though (a) is clearly the preferred reading, both readings are still there; the (b) reading is most natural, for example, in the following discourse.

86) Hariwuddo-de-wa minna-no dansei-ga dareka zyosei-o
    in Hollywood every man some woman

    aisiteiru - sono zyosei-to-wa Boo Derekku desu
    love the woman Bo Derek is

    "In Hollywood, every man loves some woman — the woman is Bo Derek."

On the other hand, (87), which is a scrambled version of (84), almost always means (85b).

87) dareka zyosei-o minna-no dansei-ga aisiteiru
    some woman every man love

    "Some woman, every man loves."

At present I regard the determination as to which is the preferred, or dominant, or possible reading about the Q scopes of a given sentence something over and above the grammar proper; it may be regarded as part of perceptual
strategy that helps to reduce the number of readings a sentence may have. This is not to deny that the issue should be treated in the grammar; the only point is that if it is to be treated in the grammar, it would be something formally quite different from the kind of rules we have been working with up to now. Partee (1975: 236) notes, for instance, of the following sentence:

88) (= Partee's (61))

Every man who finds a unicorn runs.

that "the interpretation on which there is one unicorn such that every man who finds that unicorn runs seems to be impossible, or nearly impossible, as an interpretation of (61)." Then she says, "If the most appropriate way to account for them turns out to be something like surface structure strategies (Jackendoff 1969b) or global constraints (Lakoff 1970c), then it is quite possible that something of that sort could be added to Montague's system to eliminate some of the derivations without invalidating the basic rules of the system." Further, on the same page, she notes "the notorious speaker-to-speaker variation in the perception of scope ambiguities" as partially supportive of such "second order constraints or strategies." Whether we deal with scope ambiguities within a grammar or outside, the effect, I conjecture, must boil down to something of the following sort:
89) Given two quantified expressions in a simple sentence, $Q_1$ and $Q_2$ in this order, unless contexts demand otherwise, $Q_1$ has a wider scope than $Q_2$.

Though details surely have to be worked out, (89) or something like that, I believe, must be at the core of any kind of disambiguation strategy of $Q$ scopes in a simple sentence.

Returning now to (84), (85a) reading is produced in the following manner, omitting bracketings and supplying particles:

90) $\text{minna no dansei-ga dareka zyosei-o aisiteiru :S2}$

```
minna no dansei :S8
dareka zyosei-o aisiteiru :S3

minna
"every"
dansei
"man"
dareka
"some"
zyosei
"woman"
dareka zyosei
"love"
```

Omitting certain details, the translation proceeds as follows:

91)

1. $\text{dareka zyosei} \implies \lambda P \lambda Q(\exists x)[\forall P(x) \land \forall Q(x)]$

   $\left(\text{"zyosei"}\right)$

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2. \[ \lambda Q(\exists x)[zyosei'(x) \& \forall Q(x)] : \lambda \text{-conversion, Down-Up Cancellation} \]

3. \[ \text{dareka zyosei-o aisiteiru} \implies \text{aisuru'} \]
   \[ (\forall Q(\exists x)[zyosei'(x) \& \forall Q(x)]) : T3 \]

4. \[ \text{minna no dansei} \implies \lambda P \lambda Q(\forall y)[\forall P(y) \rightarrow \forall Q(y)](\forall Q(y)) : T8 \]

5. \[ \lambda Q(\forall y)[\text{dansei'} \rightarrow \forall Q(y)] : \lambda \text{-conversion, Down-Up Cancellation} \]

6. \[ \text{minna no dansei-ga dareka zyosei-o aisiteiru} \implies \lambda Q(\forall y)[\text{dansei'}(y) \rightarrow \forall Q(y)](\forall Q(y))(\forall aisuru'(\forall Q(\exists x)[zyosei'(x) \& \forall Q(x)])) : T2 (5,3) \]

7. \[ (\forall y)[\text{dansei'}(y) \rightarrow \text{aisuru'}(\forall Q(\exists x)[zyosei'(x) \& \forall Q(x)])(y)] : \lambda \text{-conversion, Down-Up Cancellation} \]

8. \[ (\forall y)[\text{dansei'}(y) \rightarrow (\exists x)[zyosei'(x) \& \text{aisuru'}(y,x)]] : MP 3 \]

Line 8 represents (85a) reading of (84). As may be obvious from the manner of derivation, in MG, it is generally true that a quantifier \( Q_1 \) has a wider scope than a quantifier \( Q_2 \), the later \( Q_1 \) is introduced than \( Q_2 \) in the analysis tree (cf. (90)).
Keeping this correlation between the relative scopes of Qs and their order of introduction in mind, we can produce (85b) reading of (84), where the object term dareka zyosei "some woman" has a wider scope than the subject term minna no dansei "every man", from a structure like:

92) minna no dansei-ga kare8-o aisiteiru
   "Every man loves him8."

by quantifying the whole formula by the term dareka zyosei "some woman" with respect to the direct object pronoun. Approximately the syntactic and semantic translation rules for such quantification would read something like:

93) S9'. (Sentential quantification)
   If α ∈ P_T and does not have the form [kare_n]_T, and φ ∈ P_T, then F_g,n(α,φ) ∈ P_T, where F_g,n(α,φ) comes from φ by replacing an occurrence of [kare_n]_T by α.

T9'. If α ∈ P_T, φ ∈ P_T, and α, φ translate into α', φ' respectively, then F_g,n(α,φ) translates as α'(^λx_n φ').

Since (92) is equivalent to:
94) \((\forall x)[\text{dansei}'(x) \rightarrow \text{aisuru}^*_\dag(x,x_8)]\)

the result of quantifying-in the T dareka zyosei "some woman" with respect to the object pronoun via (S9') is:

95) \(\lambda Q(\forall y)[\text{zyosei}' \& \forall Q(y) (\forall x)[\text{dansei}'(x) \rightarrow \text{aisuru}^*_\dag(x,x_8)]]\)

which is equivalent to the following, after conversion via \(\lambda\)-conversion, Down-Up Cancellation, and \(\lambda\)-conversion:

96) \((\forall y)[\text{zyosei}'(y) \& (\forall x)[\text{dansei}'(x) \rightarrow \text{aisuru}^*_\dag(x,y)]]\).

(96) thus corresponds to the reading given as (85b).

(S9') as it stands is defective in at least two respects: 1) it does not take care of reflexive pronouns, and 2) it does not deal with cases where there is more than one pronoun occurring in non-subject positions. Since these two points involve what is normally called binding, we deal with them in the next chapter as was indicated in the second sentence of this chapter.
5. **Summary.**

After briefly sketching kinds of derived term in Japanese at the beginning of section 1, we pointed out a couple of syntactic and semantic differences between demonstrative adjectives and quantifiers (1.0), followed by a discussion of possible directions on how to deal with deictic expressions like kono "this", ano "that", etc., linked up with treatments of indexical pronouns watasi "I" and anata "you" (1.1). Then in section 1.2, we excluded from our discussion Qs that appear in predicate positions, noting at the same time that our examination would be limited to individual-level Qs as opposed to group-level Qs. Section 2 was an examination of several representative Qs in Japanese: section 2.0 dealt with minna "every(one)", which could occur either alone or with a CN; section 2.1 was a discussion of subete "every(thing)", which could also normally occur either alone or with a following CN; then in section 2.2 we discussed dareka "some(one)", which was peculiar in that no intervening no appeared between this and the following CN, manifesting a rather off-beat characteristic and yet showing typical syntactic behaviors with respect to Q-float; section 2.3 was a summary presentation of numeric expressions of Japanese, together with points about morphological problems; then in section 2.4 we examined relative size Qs, whose interpretation it was...
pointed out had to be accordingly relativized with respect to some frame of reference, and we adopted Bennett's (1975) tentative solution. After this survey of Qs, we turned to one of the most syntactically interesting features all Qs shared, i.e., Q-float in section 3. While the problem is not entirely solved yet, in section 3.0, we pointed out our view as to what may trigger Q-float; following Shibatani (1978) we maintained that it was rather case particles like ga and o that could trigger Q-float than case relations like subject and direct object. Then in section 3.1 we indicated operational similarities between the so-called Q-float and Scrambling, and proposed that they be the same syntactic rule. The new Q-float was thus conceived of as a kind of daughter creation that raised a Q out of T and made it a direct daughter of t. This Q was then subject to Scrambling, which is a very general rule that, though pragmatic factors that affect this transformation are far from clear, changes positions of t-daughters except the predicate. In order to treat cases where Q is moved around another Q containing expression by Scrambling, we imposed some conditions on this transformation. Then in section 4 we touched upon Q scope ambiguities and gave indications as to how to disambiguate such ambiguity in our grammar, following in large part Montague's PTQ treatment, leaving the problems of binding in general for the next chapter to deal with.
Footnotes to Chapter IV

1 Cf. UG, p.230.

2 "F" here is to be understood as an assignment of meaning to constants in intensional logic. "d1" and "d2" are metavariables over individuals.

3 Or, to be a little more precise, \( \text{ko'}(x,i,u) \oplus i,j,d_1,d_2 \)
   = 1 iff \( x \in (e_D, A, I, J) \) is in the proximity of \( F(i)<i,j,d_1,d_2> \)
   (\( = d_1 \)).

4 In UG, Montague uses \( i \) for our \( <i,j> \) (cf. p.228).

5 Morphologically, \( \text{ooi} \) "many" in (a) and \( \text{sukunai} \) "few" in (b) are adjectives.

6 For reasons I do not understand, the expected (i) and (ii) are worse than (13b):

   i) \( \text{?sukunai} \text{ hito-ga Boo-o mita} \)
   ii) \( \ast \text{sukunaku-no hito-ga Boo-o mita} \)

   "Few person Bo saw"

   "Few people saw Bo."

That (i) is better than (ii) probably shows that this and

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(13b) actually involve relative clause constructions since we have the finite forms of adjectives while in (13a) we have the form ooku rather than the finite form ooi, indicating ooku-no to be a quantifier. (13b) thus, for instance, probably is to be analyzed to have a structure like:

iii) [[Ø [kazusukunai]_A ]_T hito]_T-ga Boo-o mita.

If this is the case, it would be even more far-fetched syntactically to derive (12b) from (13b), the process involving in part raising of the adjective kazusukunai "few" two clauses up to the end of the sentence, ending up as the main verb!

7Minna, which is a colloquial form of mina, freely combines with a CN to form a T. Mina, on the other hand, usually does not enter into this construction (except perhaps the fossilized collocation mina no mono "everyone" cf. Morita (1977: s.v. mina)). Thus, I do not agree on the judgment of grammaticality of sentences like (19a), which, Inoue (1978), for instance, regards ungrammatical, the reason being that, for her, minna never combines with an NP to form a larger NP (or, put in the current terminology, minna does not combine with a CN to form a T). Probably some dialectal variation is involved here. I am grateful to John Haig for drawing my attention to Inoue (1978).
Again the issues of particles and tenses are disregarded here.

Hereafter, whenever obvious, I will omit the labelled bracketings unless clarity is in jeopardy.

The genitive no, of category (T/\ CN)/T, could, for instance, be given the following translation:

i) \[ \lambda \alpha \beta \lambda \phi (\exists x)[(\forall y)(\phi(y) \land \rho(\lambda w R(w,y))] \leftrightarrow x = y \land \phi(x) \]

where R is a relation between individuals such that w stands in the "genitive" relation, such as "possesses, owns, etc.", to y. The translation is a Russellian definite description, and still leaves much to be desired; it treats, for instance, only a case of possession, while "genitive" is notorious for being able to indicate a number of relations between two individuals, as in Taroo no hana "Taroo's mother"; Taroo no hon "Taroo's book", Taroo no syasin "Taroo's picture", Taroo no taizyuu "Taroo's weight", etc. The genitivized expression like Taroo no (\in T/\ CN) must be distinguished in the syntax from DAs (\in T/\ CN) and Qs (\in T/CN) because the sentence initial genitive no can be changed to ga while this is never the case with Qs:
ii) a. 1. Taroo no taipuraitaa-ga tubureta
   Taroo gen. typewriter broke down
   "Taroo's typewriter broke down."

2. Taroo-ga taipuraitaa-ga tubureta
   (= (1), the implication here being "it is Taroo
   whose typewriter broke down.")

b. 1. subete-no hito-ga odotta
   every person danced
   "Every person danced."

2. *subete-ga hito-ga odotta.

On the other hand, there is some reason to believe that DAs,
unlike genitivized expressions, can undergo mono-deletion as
proposed in section 2.1, with the subsequent morphological
change ano → are, kono → kore, and sono → sore. Thus, details
aside, there is good reason to regard genitivized expressions,
DAs and Qs to be syntactically separate categories as above.

Although "animal" is not included, I believe; in this
sense our mono is not a completely happy choice. When one
is not sure which to use between "モノ" and "物", one would
surely resort to katakana "モノ" or hiragana "もの" depending
on one's preference where such distinction is not apparent.

11 Although "animal" is not included, I believe; in this
sense our mono is not a completely happy choice. When one
is not sure which to use between "モノ" and "物", one would
surely resort to katakana "モノ" or hiragana "もの" depending
on one's preference where such distinction is not apparent.

12 UG, p.242.
Actually the observation is not isolated to **dareka** but applies to all the other indefinite pronominal forms that end with **-ka**, some of which are:

i) **dareka** (of people) "some(one)"
**nanika** (of things) "some(thing)"
**dokoka** (of places) "some(where)"
**ituka** (of time) "some(time)"

etc.

We note the conspicuous absence of **-ka** word that precedes CNs designating animals (and plants), although **nanika** can be often used for this purpose.

ii) **Ziroo-wa nanika doobutu-o mita**

**Ziroo** **some(thing) animal** saw

"Ziroo saw some(*thing) animal."

But compared with (ii), (iii) below sounds odd:

iii) **Ziroo-wa nanika rakuda-o mita**

**Ziroo** **some(thing) camel** saw

"Ziroo saw some(*thing) camel."

My off-hand impression is that as the CN becomes more specific (for instance, **rakuda** "camel" in (iii) as opposed
to doobutu "animal" in (ii), nanika becomes less appropriate. So this aspect of nanika must be reflected in a lexicographic study of this word.

There is, then, a certain selectional restriction between -ka form and the CN that follows it:

iv) a. dareka gakusei-ga kuru
   some(one) student come
   "Some(*one) student comes."

b. ?nanika gakusei-ga kuru
   some(thing) student come.

We could treat this either syntactically or semantically. Rather than do it syntactically, as we have put "?" in front of (b), we regard the second sentence above as syntactically well-formed, but semantically ill-formed. One way to effect this is indicated in footnote 17 below.

The original sentence that inspired me about the Q-like nature of dareka comes from a line sung by the popular Cool Five (a singing group in Japan) that goes:

i) dareka umai uso-no tukeru aite sagasu no yo
   some(one) nice fib can tell partner look for comp. particle
   "(I) will find a partner who can fib well."
Note that here *dareka* cannot be the subject in the relative clause since *dareka* may be scrambled over onto the position immediately after the relative clause head:

ii) umai uso-no tukeru aite-o dareka sagasu no yo,

suggesting that (i) has a structure like:

iii) \[
\text{[[dareka]}_Q \text{ [[umai uso-no tukeru]}_T \text{ [aite]}_CN]_T \text{ sagasu no yo}.
\]

For Q-float and Scrambling, see section 3.1 below.

15 Another approach would be to regard the sequence *dareka no* as well-formed syntactically and adjust the form morphologically by deleting *no*. S8 is based on the consideration that every expression of any category be well-formed. But as the point is reiterated, the demarcation of syntax and morphology is not always clear-cut.

16 *No* is a prenominal form of *da* "is" when *da* follows either a CN or a T. Another form *na* occurs prenominally when this is part of an adjective (cf. footnote 2, Chapter III).
17. Or, to reflect the selectional restriction semantically as discussed in footnote 13, we can give the following translation:

\[ \text{[dareka]}_Q \text{ translates as } \lambda P \lambda Q(\exists x)[\text{hito}'] \land [\neg P(x) \land \neg Q(x)]. \]

18. I take any numeric expression like hitori "one person" or hutari-no hito "two people" to mean "exactly one person" or "exactly two people", though I am aware of the position that takes these to mean "at least one person" or "at least two people" based on facts about negation.

19. These threshold figures of course should not be taken seriously; they are meant to be illustrative.

20. Needless to say, if other kinds of relative size Qs were to be included, (59) has to be extended to more than two place sequence.

21. For instance, Kamio (1977), and Kuno, as quoted in Postal (1974).

22. John Haig (personal communication) has pointed out to me that the grammaticality of (66iiib) increases significantly if we substitute a quantifier of approximation like...
sigonin "four or five people" for sannin "three people":

i) Ziroo-ga kodomo-ni sigonin okane-o yatta
  Ziroo child four or five money gave
  "Ziroo gave money to four or five children."

Though I agree with him on this judgment of grammaticality, I have no explanation for what is going on here. Cf. footnote 27 below.

23 Shibatani (1978). For marginal -ni and -e, see ibid., p.352f and 368f.

24 Shibatani (1978: 246) uses examples like:

i) korera-no sannin-no gakusei-ni eigo-ga wakarimasu
  these three student English understand
  "These three students understand English."

At present, I do not know how to treat an expression like korera-no sannin-no gakusei "these three students"; note that both korera and sannin take CNs to form Ts. What should the translation be for this kind of expression? Do we need a quantifier conjunction? Note that a simple conjunction of korera-no gakusei and sannin-no gakusei will not produce the correct translation, since there is
no way to guarantee that the same set of students are bound by these modifiers, i.e., DA korera-no "these" and Q sannin-no "three".

As opposed to (66iiib), (67b) cannot be made at all acceptable even if a quantifier of approximation like sigonin "four or five people" is substituted for sannin "three people" (John Haig (personal communication)).

See section 4 below for scope interaction and word order. See also Kuno (1973: 358ff), which we will later touch upon in section 4.

A "contains" Q iff A dominates and is commanded by Q. It appears that even condition (ii) is not sufficient to characterize Q-float properly. Thus, as Haig (1980) points out, quantifiers "do not float easily from subjects over objects" (ibid., p.1068).

i) (= Haig's (13))
   a. Suunin no gakusei wa/ga tegami o kaita.
      several students letters wrote
      'Several students wrote letters'.
   b. Gakusei wa/ga suunin tegami o kaita.
   c. ?*Gakusei wa/ga tegami o suunin kaita.
I regret that I have been unable to incorporate some of the insights of Haig (1980) about Q-float. For further details, see Haig (1980).

28 A global derivational constraint, in our terms, would be tantamount to introducing an arbitrary feature of rule application, say [+S8], to some syntactic category so that we can "know" later whether such a category has gone the application of rule S8. Thus, in case of S8, which forms a T from Q and CN, sannin no kodomo "three children" would be assigned the following structure and feature specification:

i)

\[
\begin{array}{c}
T \\
\downarrow \\
Q \\
\downarrow \\
sannin \\
\downarrow \\
no \\
\downarrow \\
kodomo \\
CN \\
[+S8]
\end{array}
\]

Such a feature may then be later made use of, as in the statement of condition on rule application.

29 Aside from Q-floating, or our Scrambling, Japanese may derive, rather freely, the sequence CN Q from the sequence Q CN; that is to say, their order may be reversed inside the T. The only restriction that I am aware of
imposed on this transformation is that Q be not dareka "some(one)" or other -ka series indefinite Qs (cf. footnote 13 above). Thus:

i) a. minna no gakusei-ga kita
    every student came
    "Every student came."

b. gakusei minna-ga kita

ii) a. Hanako-wa minna no gakusei-to hanasita
    Hanako every student-with spoke
    "Hanako spoke with every student."

b. Hanako-wa gakusei minna-to hanasita

iii) a. dareka gakusei-ga kita
    some(one) student came
    "Some student came."

b. *gakusei dareka-ga kita

iv) a. Hanako-wa dareka gakusei-to hanasita
    Hanako some(one) student-with spoke
    "Hanako spoke with some student."

b. *Hanako-wa gakusei dareka-to hanasita.

As may be obvious, regardless of the particle that follows the T, the order Q CN may be reversed to CN Q. Since no does not intervene between indefinite Qs like dareka "some(one)" and the following CN (cf. S8, p.144), this transformation is most easily stated as follows:
v) SS6. (Q-CN interchange)

\[ X, Q, no, CN, Y \]
\[ 1, 2, 3, 4, 5 \]
\[ 1, 4, \emptyset, 2, 5 \]

TT6. Identity mapping.

Kuno (1973: 361), for instance, proposes the following strategy for interpreting quantifiers in simple sentences:

i) Rule 1. The quantifier Q that appears as the leftmost quantifier either before scrambling (namely, in the structure representing the basic word order) or in the surface sentence receives the "same Q" interpretation.

Rule 2. The quantifier Q2 that appears to the right of another quantifier Q1 in the surface sentence receives the "different Q2 for each member of Q1" interpretation unless already marked otherwise by Rule 1.

For our purpose we may dub Kuno's "same Q" as "wider scope" and "different Q2 for each member of Q1" as "narrower scope than Q1". Kuno's intent for having these two separate rules of interpretation for what looks like a single phenomenon expressible by his Rule 2 is to account for the
non-ambiguity of:

ii) (= Kuno's (23))

*Sannin no syooyo o, yonin no syoonen ga okasita koto ga aru*

'(Lit.) Three girls, four boys have the experience of sexually molesting.'

He says this can only mean "Each of the same boys has sexually molested each of the same three girls." Though Kuno separates this reading from group-level reading (cf. his footnote 10, p.360), it appears to me that this reading also involves group-level reading, with distributive (as opposed to collective) sense; that is, the sentence means something like "Of a specific group of four boys, and of a specific group of three girls, each boy has distributively the experience of sexually molesting each girl." Whenever we are talking about groups and the predicate involved holds on the individual-level, we seem to get the distributive reading. Since we are not treating group-level phenomena, such reading cannot be produced in our grammar. For treatment of distributive and collective readings within MG, cf. Bennett (1975: section 4.6). As for Kuno's judgment that (ii) above has the only reading he says it does, it is doubtful that this is a consequence of quantifier interaction; note particularly the predicate *koto ga aru* "have the experience of", which it
is pragmatically reasonable to assume is to be predicated of some specific person or group. The past tense okasita "molest" also enhances this tendency. A slightly modified sentence like:

iii) sannin no syoozyo-o yonin no syoonen-ga okasu daroo

three girl four boy molest will (presumptive)

(lit.) "Three girls, four boys will molest."

clearly has the reading on which three girls will be sexually molested by four (possibly) different boys, as will be predicted by our strategy like (86). So if we disregard the group-level reading, as we do consistently throughout this work, it appears Kuno's Q interpretation strategy above and our very tentative strategy (89) will boil down to the same essential; i.e., Q₁ has a wider scope than Q₂ if these appear in this order in a simple sentence.
CHAPTER V

SOME BASIC CONSTRUCTIONS

0. Introduction.

In this chapter we will look at some of the most basic and representative constructions of Japanese and propose, where possible, our own syntactic and semantic analyses. Drawing heavily on the past literature in transformational syntax, we will specifically investigate the possibility of dispensing with rule ordering and obligatory rule application in a grammar and maintain that every expression of any syntactic category is well-formed in terms of surface syntax. The major constructions included for discussion are: reflexive pronouns (section 1), conjunction (section 2), negation (section 3), causatives (section 4), and passives (section 5). The overall consequence of our approach is a reduced number of syntactic transformations as conceived of in the standard literature in favor of formation rules that generate expressions of sub-sentential category, a position that is only possible through rich and rigorous semantics as afforded by Montague Grammar.

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1. Reflexivization and pronominalization.

1.0. Pronoun binding.

Pronominal expressions have two major functions: 1) they are referentially bound with some other nominal expressions, and 2) they deictically refer:

1) i. Reflexives.
   a. minna-ga zibun-o sonkeisuru
      every(one) self respect
      "Everyone respects himself."
   b. Taroo-wa zibun-ga warui to omou
      Taroo self wrong comp. think
      "Taroo thinks he is wrong."

ii. Pronouns.
   a. Hanako-wa Taroo-to kare-nituite hanasu
      Hanako Taroo-with he-about talk
      "Hanako talks with Taroo about him."
   b. Hanako-wa Taroo-ni kare-no heya-de butareta
      Hanako Taroo-by he's room-in was slapped
      "Hanako was slapped by Taroo in his room."

2) i. Reflexives.
   (No deictic use.1)
ii. Pronouns.

a. kare-ga odoru
   he dance
   "He dances."

b. Hanako-wa kare-ga suki da
   Hanako he is fond of
   "Hanako likes him."

The reflexive zibun, which does not change form according to person or number, may be called a "pure" pronoun since it is the only item that has to be always bound by some occurrence of a noun; the occurrence of zibun presupposes an occurrence of a nominal expression with which it is referentially bound. In section 1.1, we will take up reflexivization in Japanese, and in section 1.2 we will briefly examine bound pronouns. As for the deictic pronoun and some other usage of pronouns, we will later touch upon them in Chapter VI.

1.1. Reflexivization.

The standard formulation of (forward) Reflexivization in generative grammar may be roughly characterized as follows.
3) Reflexivization

NP, X, NP

\[ \begin{array}{c}
1, 2, 3 \\
1, 2, \text{zibun}
\end{array} \]

where (i) \( 1 = 3 \),
(ii) \( 1 \) is a subject,
(iii) \( 1 \) commands \( 3 \),
(iv) \( 1 \) is a human or higher animate noun, and
(v) obligatory if \( 1 \) and \( 3 \) are t-daughters.

Furthermore, Reflexivization is cyclical and ordered after Passivization. Let us discuss each of these conditions in the following subsections and see how we may characterize reflexivization in our grammar (cf. footnote 2), which is free of rule ordering and obligatory rule application.

1.1.1. Condition (i): \( 1 = 3 \).

This condition simply says, in part, that the reflexive zibun is referentially bound with another NP, which as we pointed out in section 1.0 has no exception to it. We have, for instance, no sentence like:
4) **Hanako-ga zibun-o nagutta**

Hanako self hit

(lit.) "Hanako hit self."

with the reading on which Hanako hit someone other than herself. A difficulty arises, as is almost always the case with any formulation in transformational grammar, when 1 (= the subject) is a quantified expression. A typical example, borrowed from Hasegawa (1980: 12), is:

5) (=Hasegawa's (19))

a. **Nihonzin zenbu-ga nihonzin zenbu-o sonkei shi-te-i-ru**
   
   Japanese all SM Japanese all OM respect-prog.-pres.
   
   "All of the Japanese respect all of the Japanese."

b. **Nihonzin zenbu-ga zibun-o sonkei shi-te-i-ru**
   
   "(lit.) All of the Japanese respect self."

Thus, though the subject nihonzin zenbu "all the Japanese" and the object nihonzin zenbu "all the Japanese" are identical in (a), the reflexivized version (b) means something totally different from (a); while we have very altruistic Japanese in (a), we have self-centered Japanese in (b). The usual way out of indexing is of no use here since both the subject NP and the object NP are coreferential, so the argument goes, for they both refer to the same set of people. In general, it is a feature of a quantified expression
that its repetition or pronominalization in a sentence results in different meanings. From a semantic point of view, this is more or less obvious considering the fact that quantified expressions are in a sense referentially closed because of a Quantifier that binds the variable.

The problem that faces a grammar is then: given the condition \(1 = 3\) on Reflexivization as in (3), how can one generate both (5a) and (5b), and assign them proper meanings?

1.1.2. **Condition (ii): \(l\) is a subject.**

This simply says that it is the subject of a sentence that triggers (forward) Reflexivization. Again there is no exception to this.\(^4\) Sentences like:

6) **Taroo**-wa **Hanako**-ni zibun-no imooto-o nagur-aseta

\[
\begin{array}{llll}
\text{Taroo} & \text{Hanako} & \text{self-'s sister} & \text{hit-caused} \\
\end{array}
\]

"Taroo caused Hanako to hit self's (i.e., his/her own) sister."

which appears to violate this condition on the surface, of course, are derived from a structure like the following via cyclic application of Reflexivization.
So, in the standard treatment, there is no exception whatsoever to the generalization that it is the subject of a sentence that triggers Reflexivization (again see footnotes 2 and 4).

1.1.3. Condition (iii): 1 commands 3.

This condition is necessary to block sentences like:

8) a. *Hanako-ga kita koto-ga zibun-no imooto-o kanasim-
Hanako came comp. self-'s sister feel sad-
asete
caused

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"That Hanako came caused her own sister to feel sad."

b. \textbf{Hanako-\textit{ga} odotte zibun-\textit{ga} utatta}\textbf{
\quad Hanako dance+and self sang}\textbf{
\quad "Hanako danced and she sang."}

In (a), the subject of a subordinate clause has reflexivized an NP in the main clause; in (b), the subject of a coordinate sentence has reflexivized another NP in the other conjunct. Neither sentence is grammatical in Japanese; hence the condition (iii).

1.1.4. \textbf{Condition (iv): 1 is a human or higher animate noun.}

This condition, as may be obvious, is a hedge, there being no clear-cut definition of "higher animate nouns". Even if there should be such a definition, this condition cannot be a grammar internal one, but rather a pragmatic condition that is most likely to show speaker-to-speaker variation. I have nothing to say about this condition in our formulation of Reflexivization below; it is simply disregarded.
1.1.5. Condition (v): obligatory if 1 and 3 are t-daughters.

This condition is usually attached to account for a contrast in grammaticality like the following:

9) a. Taroo-ga zibun-o aisiteiru
    Taroo  self  love
    "Taroo loves himself."

   b. ?Taroo-ga Taroo-o aisiteiru
    Taroo  Taroo  love
    "Taroo loves Taroo."

Compare this pair with the following:

10) a. Taroo-ga zibun-no heya-ni iru
    Taroo  self-'s room-in is
    "Taroo is in his own room."

   b. Taroo-ga Taroo-no heya-ni iru
    Taroo  Taroo-'s room-in is
    "Taroo is in Taroo's room."

With respect to Taroo, the only difference between (9b) and (10b) is that while the former has it as a direct object, hence a t-daughter, the latter has it as part of a larger NP, hence not a t-daughter. Since (10a) and (10b) are both perfectly normal sentences, it is natural, within the
standard formulation, to require that Reflexivization be obligatory when condition (v) is met, while optional otherwise. But here, the standard approach comes to an impasse because of examples like (5a) and (5b), where it was noted that (5a) is not to be converted to (5b). To repeat the point noted there, whenever the controller and the controllée are quantified expressions, even when both are t-daughters, Reflexivization must be blocked; but then there arises the problem of how one may produce the reflexivized version like (5b) with a proper assignment of meaning.

It is not at all clear whether one should exclude a sentence like (9b) from a set of well-formed sentences of Japanese. Note first that when the NP involved is first-person pronoun or second-person pronoun, both versions are perfectly normal:

11) i. a. watasi-wa watasi-o aisiteiru
    I     I love
    "I love myself (lit. me)."

    b. watasi-wa zibun-o aisiteiru
    I    self    love
    "I love myself."

   ii. a. anata-wa anata-o aisiteiru
     you    you    love
"You love yourself (lit. you)."

b. anata-wa zibun-o aisiteiru
   you    self    love
   "You love yourself."

Second, there is at least one context in which sentences like (9b) must be retained as well-formed. Kuno (1973: 49ff) notes that one of the main usages of the particle -~ is to indicate exhaustive listing, by which he means that a sentence like the following could mean either (a), in which case it is called neutral description, or (b), which is called exhaustive listing.

12) Zyon-ga sinda
   John    died
   "John died."

   a. "John died." (statement of an event)
   b. "John, and only John died."

Thus exhaustive listing -ga indicates that only the NP preceding it has the property expressed by the predicate. When we have this reading, a sentence like (9b) must be considered as a fully grammatical sentence, for notice that the following sentences express different meanings.

13) a. Taroo-ga Taroo-o aisiteiru nodeari hokano minna-wa
    Taroo    Taroo    love    but    everyone else
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It appears to me that Condition (v) is normally meant to exclude strange sentences like the following:

14) a. \textit{kare\_\textsubscript{i}-ga k\textsubscript{i}are\_\textsubscript{i}-o aisiteiru}
   
   he\_\textsubscript{i} he\_\textsubscript{i} love
   
   "He\_\textsubscript{i} loves him\_\textsubscript{i}.''

   b. Hanako\_\textsubscript{no suki\_\textsubscript{na hito\_\textsubscript{ga Hanako\_\textsubscript{no suki\_\textsubscript{na hito\_\textsubscript{o Hanako fond of person Hanako fond of person

   aisiteiru
   
   love
   
   "The man who Hanako is fond of loves the man who Hanako is fond of.'"
odd, unless the object is replaced by the reflexive \textit{zibun}: (a) involves the third person pronoun \textit{kare} while (b) involves a relative clause (and, in general, a non-basic expression). Semantically, such oddity is more or less predicted; in the case of (a), the sentence sounds odd because of the double usage of the third person pronoun either as a bound pronoun or as a deictic pronoun, there being no guarantee that the second pronoun \textit{kare} is not a deictic pronoun; in the case of (b), as the English gloss suggests, the relative clause construction is a kind of a quantified expression, hence the repetition of two identical quantified expressions would suggest that different references are intended (cf. (5)). Recall here that on p.94 we introduced relative clause formation, which we noted was a kind of derived CN. In fact any CN, when appearing alone, behaves like (14b) with respect to Reflexivization. Thus:

\begin{enumerate}
\item \textit{syoonen-ga syoonen-o aisiteiru}
\begin{itemize}
\item \textit{boy} \textit{boy} \textit{love}
\item i. "A boy loves a boy."
\item ii. *?"A boy loves himself."
\end{itemize}
\item \textit{syoonen-ga zibun-o aisiteiru}
\begin{itemize}
\item \textit{boy} \textit{self} \textit{love}
\item "A boy loves himself."
\end{itemize}
\end{enumerate}

Thus, these CNs are in a sense behaving like quantified

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expressions, a point which we will take up in the next chapter. In conclusion, I will regard (9b) well-formed in Japanese, alongside of (11), but consider (14) and (15a), when coreference is intended between the subject and the object, as ill-formed. 6

1.1.6. Our formulation.

We consider (forward) Reflexivization as part of sentence formation from expressions of categories T and IV, and replace the Subject-Verb rule S2 (p.58) by the following new rule:

16) S2. (Subject-Verb) (new version)

i. If \( \alpha \in P_T \) and has the form \([\text{kare}_n]_T \) (\( n \geq 0 \)), \( \beta \in P_{IV} \), then \( F_0(\alpha, \beta) \in P_T \), where \( F_0(\alpha, \beta) = [[\alpha -]_1 \gamma']_T \), where \( \gamma' \) is the result of replacing every occurrence of \([\text{kare}_n]_T \) (\( n \geq 0 \)) in \( \gamma \) by \([\text{zibun}]_T \), where \( \beta = [\gamma]_{IV} \).

ii. If \( \alpha \in P_T \) and does not have the form \([\text{kare}_n]_T \) (\( n \geq 0 \)), \( \beta \in P_{IV} \), then \( F_1(\alpha, \beta) \in P_T \), where \( F_1(\alpha, \beta) = [[\alpha -]_1 \gamma]_T \), where \( \beta = [\gamma]_{IV} \).

T2. If \( \alpha \in P_T, \beta \in P_{IV} \), and \( \alpha, \beta \) translate as \( \alpha' \), \( \beta' \) respectively, then \( F_0(\alpha, \beta) \) and \( F_1(\alpha, \beta) \) translate as \( \alpha'('\beta') \).

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The effect of S2 with respect to Reflexivization is that whenever a pronominal subject combines with an intransitive verb phrase, any other pronoun that is coreferential with it (i.e., any pronoun with the same subscript as the subject pronoun) is replaced by a reflexive pronoun zibun; otherwise there is no syntactic change except the simple concatenation of subject and the verb to form a sentence. Let us briefly see how the five conditions presented above are reflected in our rule.

Condition (i) is reflected by our requiring that the pronouns to be replaced by the reflexive zibun have the same subscript numeral as the subject pronoun. The difficulty noted with respect to quantifiers (cf. (5)) never arises since our way of requiring coreferentiality is only on the level of individuals. Sentences like (5) are a problem to the standard formulation simply because it is blind to the distinction between group-level coreferentiality and individual-level coreferentiality. Take again (5); clearly to index the expression nihonzin zenbu "all of the Japanese" by an index is to index the group as a whole, while the predicate involved there, i.e., sonkei shi (sic!)-te-iru "respect" is an individual-level predicate. Since reflexivization depends on the reflexivity of the predicate, in cases like (5), we should be able to have indexing on the individual level, which is precisely
what our formulation requires. In fact, while the problem is not very extensively discussed, whenever the predicate involved clearly holds, either by contexts or on its own meaning, of a group, the reflexive zibun is inappropriate:

17) a. iinkai-wa iinkai-no kettei-o musi-sita
   committee committee-'s decision disregarded
   "The committee disregarded the committee's decision."
   b. *iinkai-wa zibun-no kettei-o musi-sita

Instead, we have to use the plural of zibun, that is, zibuntati:

18) iinkai-wa zibuntati-no kettei-o musi-sita
   committee selves-'s decision disregarded
   "The committee disregarded their own (lit. selves') decision."

It appears then that at least in part the distinction between zibun and its (semantic) plural zibuntati lies in the usage that while zibun indicates individual-level reflexivity, zibuntati indicates group-level reflexivity. Indeed if we replace zibun in (5b) by zibuntati, it appears we have a sentence synonymous to (5a)$^7$ (I have reverted to my own way of Romanization of Japanese in giving the following form.):
19) nihonzin zenbu-ga zibuntati-o sonkei-si-te-iru  
Japanese all selves respect  

"All the Japanese respect themselves/the Japanese."

At any rate, since our rule is formulated in such a way that reflexive zibun only indicates individual-level coreferentiality, the difficulty a standard approach faces with respect to sentences like (5) never arises, and both (5a) and (5b) are produced with correct reading (see (21) below).

As for Condition (ii), since our Reflexivization is part of the sentence formation, the subjecthood of the controller is automatically ensured. We will discuss examples like (7), where the so-called cyclic subject is involved in yielding reflexive pronouns later in this chapter (in section 4.2.5) when we get to the discussion of causative constructions.

Condition (iii) is also a consequence of our rule since in our formulation, the controller must necessarily command the controllée, the former being the subject of the sentence to be formed.

The fourth condition, as we said, is to be disregarded.
in our grammar in the absence of any useful definition of "higher animate nouns".

Condition (v), as we pointed out, must be slightly altered; our rule is going to generate both (9a) and (9b), for instance, and at the same time block sentences like (14). We will discuss sentences like (15) in the next chapter.

We present below abbreviated sample derivations of representative sentences, together with their translations.

20) a. Taroo-ga Taroo-o aisiteiru
"Taroo loves Taroo."

\[
\begin{align*}
\text{[Taroo-ga Taroo-o aisiteiru]}_T & : S2 \\
\text{[Taroo]}_T & \quad \text{[Taroo-o aisiteiru]}_IV : S3 \\
\text{[Taroo]}_T & \quad \text{[aisiteiru]}_IV \\
\text{Translation: aisuru}'_x(t,t)
\end{align*}
\]
b. Taroo-ga zibun-o aisiteiru

"Taroo loves himself."

Translation: \( \lambda P'P(t)(^\lambda x_6 \text{aisuru}'_{x_6}(x_6,x_6)) \rightarrow \text{aisuru}'_{x}(t,t) \)

21) a. nihonzin zenbu-ga nihonzin zenbu-o sonkeisuru

"All the Japanese respect all the Japanese."

(See the next page.)
Translation: \((\forall x)[\text{nihonzin}'(x) \rightarrow (\forall y)[\text{nihonzin}'(y) \rightarrow 
\text{sonkeisuru}'*(x, y)]\]).

b. \text{nihonzin zenbu-ga zibun-o sonkeisuru}

(lit.) "All the Japanese respect self."

"Every Japanese respects himself."

(See the next page.)
Translation: $\lambda Q(\forall x)[\text{nihonzin}'(x) \rightarrow Q(x)]$

$(\lambda x_{4}\text{sonkeisuru}'_{x}(x_{4},x_{4}))$

$\rightarrow (\forall x)[\text{nihonzin}'(x) \rightarrow \text{sonkeisuru}'_{x}(x,x)]$.

We note that an ungrammatical sentence like (a) below as opposed to the grammatical (b), which contrast is normally explained in the standard approach by requiring that Reflexivization be cyclic and Q-float last cyclic and that Reflexivization precede Q-float, is never generated in our grammar. 8

22) a. *sannin no syoonen-ga zibun-o sannin semeta
three boys self three accused
(lit.) "Three boys accused three self."

b. sannin no syoonen-ga zibun-o semeta
three boy self accused
(lit.) "Three boys accused self."
The derivation of (22b) parallels (21b); (22a) is never generated because our Reflexivization is a kind of a pronoun binding, and hence there is no occasion a full NP other than a pronoun gets reflexivized; furthermore, since (forward) Reflexivization is part of sentence formation and Q-float (i.e., Scrambling (cf. SS5, p.166)) is a transformation that operates on a sentence, sentences like (22a) are a sheer impossibility. Thus the ungrammaticality of (22a) provides strong support for our approach, for note that should (22a) be grammatical, a standard approach would be able to accommodate this "fact" easily by ordering the last cyclic Q-float before Reflexivization in the final cycle while there would be no way for our approach to account for it. Thus, while the ungrammaticality of (22a) is rather an arbitrary matter of rule ordering in the standard approach, our approach predicts that sentences like (22a) cannot be grammatical under any circumstances if reflexivization is a process of pronoun binding. 9

1.1.7. Reflexive Coreference Constraint (RCC).

Howard and Niyekawa-Howard (1976) pointed out that a sentence like the following can be only two-ways ambiguous rather than the expected four-way ambiguity.

1.1.7. Reflexive Coreference Constraint (RCC).
23) Taroo-wa Hanako-ga zibun-no heya-de zibun-no imooto-o
Taroo Hanako self'-s room-in self'-s sister

nagutta to omotta
hit comp. thought
(lit.) "Taroo thought that Hanako hit self's sister in self's room."

i. "... his own sister in his own room."
ii. "... her own sister in her own room."
iii.*" ... his own sister in her own room."
iv.*" ... her own sister in his own room."

They proposed that this be explained by a constraint in Japanese of the following sort, which they called Reflexive Coreference Constraint, or RCC (Howard and Miyekawa-Howard (1976: 229)):10:

24) Reflexive Coreference Constraint (RCC)

Two instances of the reflexive pronoun zibun commanded by the same pair of possible antecedents must be coreferential. If they are not, the sentence is marked as ungrammatical.

Since our grammar (and probably any version of transformational grammar) is going to wrongly predict the four readings above for (23), some kind of constraint like the RCC must be
incorporated somehow in the system. While a solution based on RCC-like perceptual strategy may at first look appealing, this should not perhaps be pursued as a possible explanation. For note that unlike the case of quantifier scopes (cf. (89), p.172), the readings given in (23) are not based on likely and unlikely, but rather possible and impossible. In other words, the sentence in (23) is grammatical with the readings (i) and (ii), and ungrammatical with (iii) and (iv). The distinction is clear-cut. And where grammaticality is involved, the perceptual strategy seems to make no sense, for such a strategy is at best a convenient short-cut for arriving at the preferred or likely reading of a grammatical sentence. I do not know why we have a constraint like RCC in Japanese; to be sure, it would be very confusing without such a constraint, but this does not explain why. For the meantime I will resort to a makeshift solution and propose the following surface constraint, based on RCC, which presumably is a constraint to adjust forms of the output of the syntax.

25) Surface RCC

A sentence that has differently indexed multiple occurrences of zibun that command each other is ungrammatical.

Accordingly we replace \([zibun]_T\) in part (i) of S2 (p.206)
by \([zibun^*_n]_T\). (25) will mark, for instance, (23) with the reading (iii) ungrammatical because it then would have the following structure:

26) Taroo-wa [Hanako-ga zibun_6-no heya-de zibun_8-no imooto-o nagutta]_T to omotta.

Since differently indexed occurrences of zibun, zibun_6 and zibun_8 command each other, the sentence is marked as ungrammatical by (25).\(^1\)

1.2. **Pronominalization.**

Pronominalization, or quantification, as we regard it, is also a kind of individual-level variable binding; unlike the case of the reflexive zibun, the binding nominal expression is one other than the subject of a sentence. Those cases that appear to show pronominal binding by subjects are only apparently so. Observe, for instance:

27) a. Taroo-wa zibun-ga warui to omou

\[
\begin{array}{l}
\text{Taroo} & \text{self} \quad \text{wrong comp. think} \\
\text{"Taroo}_I \text{ thinks he}_I \text{ (lit. self) is wrong."}
\end{array}
\]

b. Taroo-wa kare-ga warui to omou

\[
\begin{array}{l}
\text{Taroo} & \text{he} \quad \text{wrong comp. think} \\
\text{"Taroo thinks he is wrong."}
\end{array}
\]

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While Taroo and zibun must necessarily be coreferential in (27a), Taroo and kare are only fortuitously so in (27b). That is to say, (27b) is ambiguous, or vague perhaps, as to the reference of the pronoun kare "he"; it could be either Taroo or someone else, depending on the context. In other words there is no need for Taroo to semantically bind kare "he" in (27b), while Taroo has to bind zibun in (27a). Thus, so far as examples like (27b) go, there is no need for quantification to derive the reading on which Taroo and kare are coreferential. (Such a job more properly belongs to Reflexivization as part of SS2.) Similarly, in order to semantically characterize the reading (a) below has with respect to the reference of Taroo and kare, all we have to do is to generate a sentence like (b):

28) a. Hanako-wa Taroo-to kare-nituite hanasu
   "Hanako talks with Taroo about him."

   b. Hanako-ga Taroo-to kare₄-nituite hanasu
   "Hanako talks with Taroo about him₄."

Since the subscripted pronoun corresponds to a free variable in the semantic representation (i.e., the translation in intensional logic representation), (28b) will mean, depending on the context of use according to which variables get assigned values, "Hanako talks with Taroo about Taroo/Ziroo/
But alongside (28b), the grammar may generate a sentence like:

29) Hanako-ga kare₄-to kare₄-nituite hanasu

Hanako he₄-with he₄-about talk

"Hanako talks with him₄ about him₄."

It is with respect to sentences like this that we have to have a rule of quantification that semantically binds the subscripted pronouns. (In case the controller pronoun is a subject of a sentence, of course, SS2 will convert the rest of the pronouns to reflexive *zibun's.* ) Such quantification, or pronominalization, must replace the first occurrence of kare₄ "he₄" by a T phrase and the second (and if there are more identically subscripted pronouns, all the rest of it) by an appropriate form of a pronoun. Unfortunately, Japanese lacks a particular form of a bound pronoun like *zibun* where pronominalization is involved, and the question thus is: which pronoun?

Consider first the English examples like the following:

30) a. Every man thinks he is right.
    b. No man thinks he is right.
    c. Some man thinks he is right.

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Where binding is involved, the pronoun that appears is the singular he (or she according as the head noun of the T phrase is [+male] or [+female], granted that the noun is [+human], and that the T phrase is grammatically singular). If we have a plural T phrase, the bound pronoun is invariably they:

31) a. All men think they are right.
   b. Some men think they are right.
   c. Many men think they are right.

Although I understand that all the sentences in (31) have a group-level reading, the individual-level reading is also there. English, in these respects, is very consistent: where the T phrase is grammatically singular, the pronoun is also singular, and where it is grammatically plural, the pronoun is also plural. Although the distinction singular/plural in Japanese is not grammatically as important as English, it appears such a distinction is necessary in predicting the forms bound pronouns take. Using (29) as a test frame, the following probably is the least controversial T phrase-pronoun replacement pairs:

32) a. ... Taroo-to kare-nituite ...

   Taroo-with he-about
b. ... Yosiko-to kanozyo-nituite ...
    Yosiko-with she-about

c. ... dareka dansei-to kare-nituite ...
    some(one) man-with he-about

d. ... dareka zyosei-to kanozyo-nituite ...
    some(one) woman-with she-about

e.* ... sannin-no dansei-to kare-nituite ...
    three men-with he-about

f. ... sannin-no dansei-to karera-nituite ...
    three men-with they-about

g.* ... gonin-no zyosei-to kanozyo-nituite ...
    five women-with they-about

h. ... gonin-no zyosei-to kanozyora-nituite\textsuperscript{14} ...
    five women-with she's-about

i.* ... minna-no dansei-to kare-nituite ...
    all/every man-with he-about

j. ... minna-no dansei-to karera-nituite ...
    all/every man-with they-about

Although karera and kanozyora literally mean "he's or he and others" and "she's or she and others" respectively\textsuperscript{15}, these forms seem to be able to function as bound pronouns. As with English examples (31), (f), (h), and (j) above are ambiguous between the group-level and the individual-level readings. Since plurality of pronouns seems to go hand-in-hand with that of the quantifiers, we regard it to be a feature.
of a Q; basic Ts like Taroo or kare₄ are always singular.

We may now regard our lexical items to have a certain feature specification of the following sort:

33) a. \([\text{Taroo} \; +\text{human} \; +\text{male} \; -\text{plural}]_T\)
   b. \([\text{Hanako} \; +\text{human} \; +\text{female} \; -\text{plural}]_T\)
   c. \([\text{minna} \; +\text{plural}]_Q\)
   d. \([\text{dansei} \; +\text{human} \; +\text{male}]_{CN}\)
   e. \([\text{dareka} \; -\text{plural}]_Q\)
   f. \([\text{hitori} \; -\text{plural}]_Q\)
   g. \([\text{sannin} \; +\text{plural}]_Q\)

("Taroo" "Hanako" "every" "man"

"some(one)" "one (person)" "three (people)"

For the sake of clarity, we replace all the subscripted pronouns of the form \([\text{kare}_n]_T\) \((n \geq 0)\) by the following:

34) \([\text{PRO}_n]_T\).

The pronominalization, or Sentential Quantification S9' (p.174) may now be restated as:

35) S9. (Sentential Quantification)

If \(\alpha \in P_T\) and \(\alpha \neq [\text{PRO}_m]_T\), \(\phi \in P_T\) and \(\phi\) contains an occurrence of \([\text{PRO}_n]_T\), then \(F_{8,n}(\alpha, \phi) \in P_T\), where \(F_{8,n}(\alpha, \phi)\) comes from \(\phi\) by replacing the first occurrence of \([\text{PRO}_n]_T\) by \(\alpha\) and all the other occurrences of \([\text{PRO}_n]_T\) by \([\text{PRO}_\gamma]_T\), where \(\gamma\) is a feature specification of \(\alpha\).
T9. If $\alpha \in P_T$, $\phi \in P_T$, and $\alpha$, $\phi$ translate as $\alpha'$, $\phi'$ respectively, then $F_{\beta, n}(\alpha, \phi)$ translates as $\alpha'(\neg \lambda x_n \phi')$.

S9, if applied to a sentence like (29) with a T phrase Taroo, will yield the following formula of category t:

$$\text{Hanako, +human, +female, -plural}_T \quad \text{Taroo, +human, +female, -plural}_T \quad \text{PRO, +human, +male, -plural}_T \quad \text{nituite hanasu}$$

The feature bundle $\text{PRO, +human, +male, -plural}_T$ would be morphologically interpreted as kare "he".

Hereinafter we simply assume a feature specification of the above sort for any lexical item $(\epsilon B \in \{T, CN, Q\})$ unless otherwise mentioned, and continue using a "featureless" flat lexical representation.

2. Conjunction.

Conjunction (and disjunction) may be discussed on several levels; for expository purpose of our grammar, we will discuss it in the following order: sentential conjunction, VP conjunction, and NP conjunction, and call these
t-conjunction, IV-conjunction, and T-conjunction, respectively for obvious reasons. The standard approach of deriving the latter two from the first by Conjunction Reduction is not adopted for reasons to be given later as we discuss these constructions.

2.0. Preliminaries.

Since most conjunctions affect the verb morphology (of the left conjunct), as in:

37) a. Taroo-ga odoru
    Taroo dance
    "Taroo dances."

b. Hanako-ga utau
    Hanako sing
    "Hanako sings."

c. Taroo-ga odotte Hanako-ga utau
    Taroo dance+and Hanako sing
    "Taroo dances and Hanako sings."

where the verb in the left conjunct of (c), which is a result of conjoining (a) and (b), takes on the form odotte rather than odoru as in (a), we indicate, hereinafter and where necessary, the verb morphology, based on the standard
classification of consonant stem verbs and vowel stem verbs. Furthermore, where clarity is absolutely necessary, we use grammatical formatives Pres and Past, rather than their corresponding morphemes ru and ta in case of verbs, and i and (kat)ta in case of adjectives. Some sample official representations of verbs and adjectives, together with their semi-official versions are:

38) Official Semi-official

<table>
<thead>
<tr>
<th>Official</th>
<th>Semi-official</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consonant stem verbs</strong></td>
<td></td>
</tr>
<tr>
<td>([\text{odor-Pres}<em>V]</em>\text{IV})</td>
<td>([\text{odor-ru}<em>V]</em>\text{IV}, [\text{odoru}<em>V]</em>\text{IV}, [\text{odoru}]_\text{IV}', \text{odoru}. )</td>
</tr>
<tr>
<td>(&quot;dance&quot;)</td>
<td></td>
</tr>
<tr>
<td>([\text{utaw-Pres}<em>V]</em>\text{IV})</td>
<td>([\text{utaw-ru}<em>V]</em>\text{IV}, [\text{utau}<em>V]</em>\text{IV}, [\text{utau}]_\text{IV}', \text{utau}. )</td>
</tr>
<tr>
<td>(&quot;sing&quot;)</td>
<td></td>
</tr>
<tr>
<td><strong>Vowel stem verbs</strong></td>
<td></td>
</tr>
<tr>
<td>([\text{ni-Pres}<em>V]</em>\text{IV})</td>
<td>([\text{ni-ru}<em>V]</em>\text{IV}, [\text{niru}<em>V]</em>\text{IV}, [\text{niru}]_\text{IV}', \text{niru}. )</td>
</tr>
<tr>
<td>(&quot;boil&quot;)</td>
<td></td>
</tr>
<tr>
<td>([\text{yase-Pres}<em>V]</em>\text{IV})</td>
<td>([\text{yase-ru}<em>V]</em>\text{IV}, [\text{yaseru}<em>V]</em>\text{IV}, [\text{yaseru}]_\text{IV}', \text{yaseru}. )</td>
</tr>
<tr>
<td>(&quot;become thin&quot;)</td>
<td></td>
</tr>
</tbody>
</table>
Adjectives

[[waka-Pres]_{A}]_{IV} \quad [[waka-i]_{A}]_{IV}, \quad [[wakai]_{A}]_{IV},
("young") \quad [wakai]_{IV}, \quad wakai.

[[sizuka [da-Pres]_{C}]_{A}]_{IV} \quad [[sizuka [da]_{C}]_{A}]_{IV},
("quiet") \quad [[sizuka da]_{A}]_{IV}, \quad [sizuka da]_{IV},
\quad sizuka da.

The copula da is irregular; so in a sense it is out of paradigm, but we represent it as above in the last example.

Another point about conjunction that has to be mentioned at the outset is the fact that when we have t-conjunction or IV-conjunction, unless ideas expressed in each conjunct are somehow related to each other, the whole sentence sounds very strange:

39) a. Taroo-ga gakusei da si Reegan Daitooryoo-ga kita
   Taroo  student is and Reagan President  came
   "Taroo is a student and President Reagan came."

b. Hanako-ga ki-te waka-katta
   Hanako  come-and young-Past
   "Hanako came and was young."

This aspect of conjunction, I regard, is a matter of usage,
and is disregarded in the following discussion; a certain syntactic tendency bearing on this point is that if the left conjunct expresses ideas with a verb, then the whole sentence sounds better if the right conjunct also expresses ideas with a verb, if an adjective, then an adjective, etc., but at the moment I do not know how to precisely characterize such syntactic "parallel-ness" between two conjuncts, and in the following discussion, examples are deliberately chosen so that sentences with coordination will not sound odd or strange simply because of such "out-of-balance" conjunction.

2.1. t-conjunction.

Basically sentences in Japanese are conjoined in three different ways \(^1\); from (a) and (b) below, one may thus obtain three forms (c), (d), and (e).

40) a. Ziroo-ga utaw-ru

Ziroo sing-Pres

"Ziroo sings."

b. Hanako-ga odor-ru

Hanako dance

"Hanako dances."
c. Ziroo-ga utaw-ru si Hanako-ga odo-ru
    and

d. Ziroo-ga utaw-te Hanako-ga odoru
    sing-and

e. Ziroo-ga utaw-i Hanako-ga odor-ru
    sing-and

"Ziroo sings and Hanako dances."

Let us call (c) si-conjunction, and (d)/(e) -te/-i conjunc-
tion. As is obvious, si-conjunction most closely resembles
English conjunction; it is a simple juxtaposition of two
sentences (though sometimes it carries implication of "and,
moreover"). On the other hand, -te/-i conjunction involves
morphological alternation of verbs in the left conjunct; the
tense marker is replaced by -te/-i: the forms utaw-te and
utaw-i (or utatte and utai after morphological and phonolo-
gical interpretations) are what may be called non-finite
forms, being unable to end a sentence.20 One big difference
between si-conjunction and -te/-i conjunction has to do with
the interpretation of tense. Since si-conjunction is a sim-
ple juxtaposition of two full sentences, each conjunct may
be of either tense:

41) a. Ziroo-ga utaw-ta si Hanako-ga odor-ru
    Ziroo      sing-Past and Hanako dance-Pres

"Ziroo sang and Hanako dances."
b. *Ziroo-ga utaw-ru si Hanako-ga odor-ta*
   
   sing-Pres dance-Past

   "Ziroo sings and Hanako danced."

c. *Ziroo-ga utaw-ta si Hanako-ga odor-ta*

   sing-Past dance-Past

   "Ziroo sang and Hanako danced."

Thus (40c) and (41) are all grammatical sentences. -te/-i conjunction, on the other hand, lacks the parallels of (41a) and (41b); if the verb in the right conjunct is in the present tense, then the one in the left conjunct is also understood to be in the present tense, and if it is in the past tense, so is the verb in the left conjunct. This is more or less understandable since verbs in the left conjuncts of these conjunctions are non-finite forms.21 As for the difference between -te-conjunction and -i-conjunction, since these often go together syntactically22 and they present no apparent semantic difference, it seems best to regard these as stylistic variants; -te-conjunction represents informal style, and -i-conjunction represents formal (writing) style (cf. footnote 2 to Chapter III).23 As was the case with the copula da and dearu, we use -te-conjunction in the presentation of rules. The rules for t-conjunction are:
42) S10. (t-conjunction)

i. If \( \phi, \psi \in P_t \), then \( F_9(\phi, \psi) \in P_t \), where \( F_9(\phi, \psi) = [\phi \text{ si } \psi]_t \).

ii. If \( \phi, \psi \in P_t \) and \( \phi, \psi \) are of the same tense, then \( F_{10}(\phi, \psi) \in P_t \), where \( F_{10}(\phi, \psi) = [\phi' \psi]_t \), where \( \phi' \) is the result of replacing the main verb tense marker in \( \phi \) by \( \text{te} \). 24

T10. If \( \phi, \psi \in P_t \) and translate as \( \phi', \psi' \) respectively, then \( F_9(\phi, \psi), F_{10}(\phi, \psi) \) translate as \( \phi' \& \psi' \). 25

We give partial sample derivations and translations for (40c) and (40d).

43) a. Ziroo-ga utau si Hanako-ga odoru (= (40c))

Ziroo  sing and Hanako  dance

"Ziroo sings and Hanako dances."

\[ [\text{Ziroo-ga utaw-Pres si Hanako-ga odor-Pres}]_t \] :S10i

\[
\begin{array}{c}
\text{Ziroo-ga utaw-Pres} \\
\text{Hanako-ga odor-Pres}
\end{array}
\]

(The top line of this derivation is equivalent to the following tree.)
Translation: *utau'(z) & *odoru'(h).

b. Ziroo-ga utatte Hanako-ga odoru (= (40d))

Ziroo sing-and Hanako dance
"Ziroo sings and Hanako dances."

\[ [\text{Ziroo-ga utaw-te Hanako-ga odor-Pres}] \]

(= S10ii)

(The top line of this derivation is equivalent to
the following tree diagram.)

Translation: *utau'(z) & *odoru'(h).
Consider now the following:

44) i. a. **Ziroo-ga utat-ta si Ziroo-ga odot-ta**  
   **Ziroo** sing-Past and **Ziroo** dance-Past  
   b. **Ziroo-ga utat-ta si odot-ta**  

ii. a. **Ziroo-ga utat-te Ziroo-ga odot-ta**  
   **sing-and**  
   b. **Ziroo-ga utat-te odot-ta**  

iii. a. **Ziroo-ga uta-i Ziroo-ga odot-ta**  
   **sing-and**  
   b. **Ziroo-ga uta-i odot-ta**  
   (a. "Ziroo sang and Ziroo danced.")  
   (b. "Ziroo sang and danced.")

The sentences of each pair are synonymous; one cannot be false without the other being false. On the face of it, the b-versions above may have either of the following structures:

45) i. 

```
     t
  /   \
 t   t
```

```
     t
  /   \
 t   v
```

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The structure (i) will result if the subject of the right conjunct in (44) is simply deleted; the structure (ii) will result if either 1) a conjunction reduction of the usual sort has applied to the a-versions, or 2) verbs are conjoined by IV-conjunction. In the next section we show that si-conjunction, regardless of the subject deletion of the right conjunct, must have a sentential coordination as its structure while b-versions of -te/-i conjunction has the structure indicated in (45ii).

2.1.1. si-conjunction vs. -te/-i conjunction. 26

Consider an IV taking verb like -itagaru 27 "want (to)".

46) a. Hanako-wa utau si odor-itagaru

Hanako sing and dance-want (to)

"Hanako sings and wants to dance."

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b. Hanako-wa utat-te/uta-i odor-itagaru
    Hanako     sing-and/sing-and dance-want (to)
    "Hanako wants to sing and dance."

Unlike (46b), where we have -te/-i conjunction, (46a) can never mean "Hanako wants to sing and dance." In order to express this, one would have to say:

47) Hanako-wa uta-itagaru si odor-itagaru
    Hanako     sing-want (to) and dance-want (to)
    (lit.) "Hanako wants to sing and wants to dance."

That (46a) never means (47) thus indicates that the sequence utau si odor- in (46a) never forms the constituent IV, thus being unable to semantically combine with -itagaru "want (to)". This observation would follow if we assume that (46a) or (44ib) has the structure (45i). On the other hand, the fact that (46b) means what it means indicates that the sequence utat-te/uta-i forms a constituent such that it is semantically capable to combine with -itagaru "want (to)". In the next section we propose a rule for deriving (45i), and in the section after next, we argue that (45ii) is to be derived, not by conjunction reduction, but by IV-conjunction.
2.1.2. **Right Conjunct Subject Deletion.**

In order to derive (45i), we need to delete the subject in the right conjunct. The deletion, however, cannot be simply effected under structural identity of the two subjects. First, note that (a) and (b) below are not synonymous:

48) a. *takusan-no* hito-ga utatta si *takusan-no* hito-ga odotta
   many people sang and many people danced
   "Many people sang and many people danced."

b. *takusan-no* hito-ga utatta si Ø odotta
   many people sang and Ø danced
   "Many people sang and danced."

While the same set of people, who were many in number, sang and danced in (b), this is not necessarily the case in (a). Second, observe:

49) a. *takusan-no* hito-ga utatta si *takusan-no* hito-ga
   many people sang and many people
   utaw-anakatta
   sing-did not
   "Many people sang, and many people did not sing."

b. *takusan-no* hito-ga utatta si Ø utaw-anakatta
   many people sang and Ø sing-did not
   "Many people sang and did not sing."
While (a) is not contradictory, (b) is. If the structural identity is sufficient to delete the "identical" subject in the right conjunct, we would not expect these contrasts in meaning. As was the case with Reflexivization (as part of S2), this deletion transformation seems sensitive to referential identity on the individual-level, which, in our framework, means that the transformation must be defined over conjoined sentences with identically subscripted pronoun subject in each conjunct.

50) SS7. (Right Conjunct Subject Deletion)

\[ \text{1, 2, 3, 4} \]

TT7. Identity mapping.

We give below a partial sample derivation with its translation for a sentence like (48b), which has a quantified subject deleted by Right Conjunct Subject Deletion.

51) takusan-no hito-ga utau si odoru

many people sing and dance

"Many people sing and dance."
takusan-no hito-ga utau si odoru :S9

\[
\begin{align*}
\text{takusan-no hito} & :S8 \quad \text{PRO}_2\text{-ga utau si odoru} :SS7 \\
\text{takusan hito} \quad \text{PRO}_2\text{-ga utau si PRO}_2\text{-ga odoru} :S10
\end{align*}
\]

"many" "people"

\[
\begin{align*}
\text{PRO}_2\text{-ga utau} \quad \text{PRO}_2\text{-ga odoru}
\end{align*}
\]

Translation:

1. \(\text{PRO}_2\text{-ga utau si PRO}_2\text{-ga odoru} \Rightarrow \text{utau}'(x_2) \& \text{odoru}'(x_2)\) :T10

2. \(\text{PRO}_2\text{-ga utau si odoru} \Rightarrow \text{utau}'(x_2) \& \text{odoru}'(x_2)\) :TT7 (1)

3. \(\text{takusan-no hito} \Rightarrow \lambda P(T^n x)[\text{hito}'(x) \& \text{P}(x)]\) :T8

4. \(\text{takusan-no hito-ga utau si odoru} \Rightarrow \lambda P(T^n x)[\text{hito}'(x) \& \text{P}(x)] \]

\[
\left(\neg \lambda x_2[\text{utau}'(x_2) \& \text{odoru}'(x_2)]\right) \quad :T9 (2,3)
\]

5. \(\neg \Rightarrow (T^n x)[\text{hito}'(x) \& [\text{utau}'(x) \& \text{odoru}'(x)]\]

Thus (51) is true with respect to an interpretation \(\alpha\), a point of reference \(i,j\), and a frame of reference \(h(n)\), iff many people sing and dance.

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2.2. IV-conjunction.

We now turn to the problem of deriving the structure (45ii) for sentences like (44iib) and (44iiib). As was pointed out earlier, there are at least two ways for deriving such a structure; either by Conjunction Reduction or by IV-conjunction. In the next section we give some reasons for rejecting the Conjunction Reduction approach, and then in the section after next, give a rule for IV-conjunction and its translation.

2.2.1. Conjunction Reduction.

Consider again (44ii), repeated below as (52):

52) a. Ziroo-ga utat-te Ziroo-ga odot-ta
    Ziroo sing-and Ziroo dance-Past
    "Ziroo sang and Ziroo danced."

   b. Ziroo-ga utat-te odot-ta
    Ziroo sing-and dance-Past
    "Ziroo sang and danced."

Suppose Conjunction Reduction is roughly of the following sort, where (a) and (b) are input sentences, and (c) the output.
53) a. \(X [\alpha]_A Y\)
b. \(X [\beta]_A Y\)
c. \(X [[\alpha]_A \& [\beta]_A]_A Y\).

Suppose further that (a) and (b) are left and right conjuncts, respectively. This formulation, disregarding details, can convert (52a) to (52b). Since both are synonymous, the translation would be an identity mapping. But now consider the following two sentences.

54) a. \(\text{takusan-no hito-ga utat-te takusan-no hito-ga odoru}\)
   "Many people sing and many people dance"
   \(\text{many people sing-and many people dance}\)
   b. \(\text{takusan-no hito-ga utat-te odoru}\)
   "Many people sing and dance."

As was the case with si-conjunction, (54a) and (54b) are not necessarily synonymous; for instance, where a group of people, who are many in number, dance, and another different group of people, who are also many in number, sing, (54a) is true, while (54b) is not unless the two groups coincide in membership. This would require then that in the formulation (53), X be pronominal if X is a T. Such requirement would block the conversion from (54a) to (54b). (54b) would then be derived in the following fashion:
The translation parallels (51) except that where Right Conjunct Subject Deletion is used in (51), we have C. R. (Conjunction Reduction). So far, so good. But now consider sentences like:

56) a. Hanako-ga takusan-no hito-o nagut-te takusan-no
   Hanako many people hit and many
   hito-o ketta
   people kicked
   "Hanako hit many people and kicked many people."

b. Hanako-ga takusan-no hito-o nagut-te ketta
   "Hanako hit and kicked many people."

As was the case with (54), the pair in (56) are not synonymous; one can be true without the other being also true. In order to block the derivation from (a) to (b), it appears then that we have to require that X in (53) contain no
nonpronominal Ts. Similarly we appear to have to require that Y in (53) contain no nonpronominal Ts. But this requirement, while favorable in cases like the above, would lead to unfavorable consequences. Take, for instance, the following sentence.

57) **Taroo to Hanako-ga kappa-o sagasu**

*Taroo and Hanako kappa seek*  
"Taroo and Hanako seek kappa."

As is always the case with intensional verbs like *sagasu* "seek" and a non-basic T like *kappa*\(^{29}\), the sentence is ambiguous between extensional and intensional readings: the former commits us to the existence of a kappa, but the latter does not. But the requirement that X and Y in Conjunction Reduction (53) not contain any nonpronominal Ts would force us to predict counterfactually that (57) has only an extensional reading. This is so because the only source for (57) that may be reduced by Conjunction Reduction is the following pair of sentences:

58) a. **Taroo-ga PRO\(_8\)-o sagasu**

*Taroo PRO\(_8\) seek*  
"Taroo seeks PRO\(_8\)."

b. **Hanako-ga PRO\(_8\)-o sagasu**

"Hanako seeks PRO\(_8\)."

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After Conjunction Reduction, we get (a) below, into which we can quantify \( \kappa \), which we may here understand to be translated as \( \lambda \mathbf{P}(\mathbf{h})[\kappa'(\mathbf{x}) \land \mathbf{P}(\mathbf{x})] \), and get (b), whose translation therefore is (c).

59) a. Taroo to Hanako-ga PRO\( _8 \)-o sagasu
   "Taroo and Hanako seek PRO\( _8 \)."

b. Taroo to Hanako-ga kappa-o sagasu
   "Taroo and Hanako seek a kappa."

c. \( \lambda \mathbf{P}(\mathbf{h})[\kappa'(\mathbf{x}) \land \mathbf{P}(\mathbf{x})](\neg \lambda \mathbf{x}_8[\text{sagasu'}^*(\mathbf{t}, \mathbf{x}_8) \land \text{sagasu'}^*(\mathbf{h}, \mathbf{x}_8)]) \rightarrow (\exists \mathbf{x})[\kappa'(\mathbf{x}) \land [\text{sagasu'}^*(\mathbf{t}, \mathbf{x}) \land \text{sagasu'}^*(\mathbf{h}, \mathbf{x})]]. \)

Thus, though sagasu' may create an intensional context with respect to its semantic object, the requirement that Ts in such a position be subscripted pronouns has the effect of requiring that Ts in such a position be always extensional. In spite of all the syntactic plausibility for Conjunction Reduction, it thus appears that there is no general way to uphold it within our framework that is compatible with semantics.

2.2.2. A rule for IV-conjunction.

Our rule for deriving coordinate IV's is:

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60) S12. (IV-conjunction)

If $\alpha, \beta \in \mathcal{P}_{IV}$, then $F_{11}(\alpha, \beta) \in \mathcal{P}_{IV}$, where $F_{11}(\alpha, \beta) = [\alpha' \beta]_{IV}$, where $\alpha'$ is the result of replacing the present tense marker $\text{Pres}$ by $\text{te}$.

T12. If $\alpha, \beta \in \mathcal{P}_{IV}$, and $\alpha, \beta$ translate as $\alpha', \beta'$ respectively, then $F_{11}(\alpha, \beta)$ translates as $\lambda x[\alpha'(x) \& \beta'(x)]$.

We give below a partial sample derivation involving the use of S12 with its translation:

61) Hanako-ga utat-te odor-u

Hanako sing-and dance
Hanako sings and dances."

Translation:

1. $\text{utat-te odor-Pres} \implies \lambda x[\text{utau}'(x) \& \text{odoru}'(x)]$
2. \text{Hanako} \implies \lambda P'P(h)

3. \text{Hanako-ga utat-te odor-Pres} \implies \lambda P'P(h) \\
\left( \^\lambda x[\text{utau}'(x) \& \text{odoru}'(x)] \right) : T2 (1,2)

4. \rightarrow \ ^\lambda x[\text{utau}'(x) \& \text{odoru}'(x)](h) : \lambda \text{-conversion}

5. \rightarrow \lambda x[\text{utau}'(x) \& \text{odoru}'(x)](h) : \text{Down-Up}

6. \rightarrow \text{utau}'(h) \& \text{odoru}'(h) : \lambda \text{-conversion}

The derivation of a sentence whose subject contains a Q like (54b) would parallel (61), mutatis mutandis.

A partial derivation for (46b), with a rule to be given later, would proceed as follows:

62) \begin{align*}
\text{Hanako-ga utat-te odor-itagaru} & : S2 \\
\text{Hanako} & \quad \text{utat-te odor-itagaru} : (\text{Rule} \\
"\text{Hanako}" & \quad \text{to be} \\
\text{utat-te odor-Pres} & : S12 - \text{itagaru given} \\
"\text{want (to)}" & \\
\text{utaw-Pres} & \quad \text{odor-Pres} \\
"\text{sing-Pres}" & \quad "\text{dance-Pres}" \\
\end{align*}

This would correspond to the reading "Hanako wants to sing and dance." The other reading pointed out in footnote 28 is to be derived in the following fashion. (Recall that
(62) is the preferred reading over (63) for the reason noted in the footnote; as was noted there, a suitable choice of verbs would sometimes reverse such an order of preferability.)

63) Hanako-ga utat-te odor-itagaru :S2
   Hanako utat-te odor-itagaru :S12
   "Hanako"
   utaw-Pres odor-itagar-Pres : (Rule "sing-Pres"
   odor-Pres -itagar-Pres given)
   "dance-Pres" "want-Pres (to)"

This corresponds to the reading "Hanako sings and wants to dance," which, as was also pointed out in footnote 28, can be also derived if SS7 (Right Conjunct Subject Deletion) should be made applicable to -te/-i conjunction as well as to si-conjunction. It is to be noted that the way S2 is formulated in our grammar, (61), for instance, does not have the structure (a) below but rather (b).31

64) a.
   t
   I
   T
   Hanako ga utat-te odor-u
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2.3. T-conjunction.

Since we have abandoned Conjunction Reduction for deriving coordinate structures, the only way for deriving coordinate Ts is by means of direct conjoining of them. This approach in general avoids the problem noted with respect to (57). Before seeing why this is so, let us set down the rule of T-conjunction.

65) S14. (T-conjunction)
   If $\alpha, \beta \in P_T$, and $\alpha \neq \beta$, then $F_{12}(\alpha, \beta) \in P_T$,
   where $F_{12}(\alpha, \beta) = [\alpha \text{ to } \beta]_T$.

T14. If $\alpha, \beta \in P_T$, and $\alpha, \beta$ translate as $\alpha', \beta'$ respectively, then $F_{12}(\alpha, \beta)$ translates as
   $\lambda P[\alpha'(P) \& \beta'(P)]$.

The proviso in S14 that "$\alpha \neq \beta$" is to avoid phrases like:
66) a. Ziroo to Ziroo  
"Ziroo and Ziroo"

b. PRO₂ to PRO₂  
"PRO₂ and PRO₂"

c. subete-no dansei to subete-no dansei  
"every man and every man"

In general the appearance of two identical conjuncts in any kind of conjunction is odd; it could be that Gricean explanation is to be given and that the proviso above is to be removed from S14. Turning now to (57), we note that the problem raised about Conjunction Reduction approach with respect to the intensional reading of (57) never arises with our approach simply because we can directly generate the sentence without any restriction by means of S14. A partial analysis tree may look like the following:

67) Taroo to Hanako-ga kappa-o sagasu :S2

   Taroo to Hanako :S14 kappa-o sagasu :S3

   Taroo Hanako kappa sagasu

   "Taroo" "Hanako" kappa "seek"

Thus the direct combination of kappa and sagasu "seek" enables the former to get inside the intensional context created by the latter.
Since conjunctive particle *to* may optionally appear before the case/adverbial particle, making, for instance, the following synonymous:

68) a. Taroo to Hanako to Ziroo-ga gakusei da  
   Taroo and Hanako and Ziroo student is  
   "Taroo, (and) Hanako, and Ziroo are students."

   b. Taroo to Hanako to Ziroo to-ga gakusei da

we need a transformation to take care of this alternation.

69) SS8. (Conjunction Particle Insertion)

   X T to, T, A Y  
   1 , 2, 3 ---->  
   1, 2+to, 3

   where A ∈{ga, o, ni, de, kara}.

2.4. Conjunction vs. other constructions.

Conjunctions interact with other constructions in an interesting way, and in what follows we will examine some of these, deferring the discussion of the interaction between negation and conjunction to a later section when we get to talk about negation.
2.4.1. Qs and T-conjunction.

A sentence like the following:

\[\text{subete-no tetugakusya to ongakuka-ga kuru}\]

\textit{every philosopher and musician come}  

"Every philosopher and musician comes."

might raise a new possibility of establishing a CN conjunction (cf. the discussion in section 6.1, Chapter III), for, on the face of it, the subject of (70) may be considered to have a structure like:

\[\text{subete-no tetugakusya to ongakuka}\]

"every" "philosopher" "and" "musician"

But again CN conjunction cannot be maintained. Note first that (70) always means (72a), and never (72b).
72) a. Every philosopher and every musician comes.
   b. Every philosopher-musician comes.

There is a situation in which (b) is true, and (a) false. But if the subject of (70) is to be the result of CN conjunction, the reading we would expect is (72b), as is obvious from (71). We must conclude that no CN conjunction is involved in the formation of the subject quantified expression subete-no tetugakusya to ongakuka "every philosopher and musician". The fact that (70) means (72a), and not (72b), may be confirmed by the validity of drawing either (a) or (b) below as a conclusion from it.

73) a. subete-no tetugakusya-ga kuru
        every     philosopher     come
   "Every philosopher comes."
   b. subete-no ongakuka-ga kuru
        every     musician     come
   "Every musician comes."

Second, note the contrast in grammaticality between the following two sentences:

74) a. *Ziroo-ga tetugakusya to ongakuka da
        Ziroo     philosopher and musician is
   "Ziroo is a philosopher and musician."
   - 250 -
b. Ziroo-ga tetugakusya de ongakuka da

Ziroo philosopher is and musician is
"Ziroo is a philosopher and musician."

This suggests that CN conjunction (with the particle to) is a sheer impossibility. Facts like these (and those presented in Chapter III) thus further confirm that Japanese does not have CN conjunction. How is a structure like (70) to be derived then? To this we turn in the next section.

2.4.2. Q-float and T-conjunction.

Recall that our rule of Q-float extracted Q out of the T it originated in and made it a direct daughter of t (cf. SS4 (Q-float), p.164). A sentence like (70) is also subject to this transformation, as we see in the grammaticality of (75).

75) subete tetugakusya to ongakuka-ga kuru

Furthermore, this subete "every" may hop over via Scrambling (p.166):

76) tetugakusya to ongakuka-ga subete kuru

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(75) and (76) are both synonymous to (70); they all mean "Every philosopher and every musician comes." In order for (70) to feed into Q-float, it must have the structure:

Since (70) means (72a), it must originally have the form:

Thus the problem is that of converting (78) to (77), or where Ts are concerned, that of converting (79) to (80).
(80) actually is (71). But there is no conflict here with what I have said with respect to (71). What we have argued against there (and in Chapter III) is the direct generation of coordinate CNs by a formation rule as an independent unit, capable of combining with other units via some formation rule. Thus the argument has to do with the syntactic and semantic undesirability of letting conjoined CNs have combination potential with other (sub-sentential) expressions. But the structure as appears in (80) (which actually is a part of (77)) is what may be called "derivative conjunction"
in the sense that it is a derived structure via a trans-
formation from (79) (which is in fact a part of (78));
nowhere does the conjunction CN have any combination po-
tential with any other expression in such a derivation.
How then is (80) to be derived from (79)? If one had Con-
junction Reduction, one would surely use it. But note that
even then, unless one had some sort of tree pruning conven-
tion precisely formulated, the conversion from (79) to (80)
(or, rather from (78) to (77)) is no smooth sailing. For
our grammar, since the conversion is not affected by anything
outside the T phrase in question, we regard it to be part
of formation rules of the following sort:

81) S16. (Identical Qs)

If \( z \in T \) and has the form \( \left[ [\alpha]_Q \ (no) \ [\beta]_{CN} \right]_T \) to
\( \left[ [\alpha]_Q \ (no) \ [\gamma]_{CN} \right]_T \), where \( [\alpha]_Q \) is not a numeric
expression Q, then \( F_{16}(z) \in T \), where \( F_{16}(z) =
\left[ [\alpha]_Q \ (no) \ [\beta]_{CN} \ to \ [\gamma]_{CN} \right]_T \).

T16. Identity mapping.

Although S16 is a very complex rule structurally, converting
(79) to (80), for instance, I am not at all surprised that
something like this is necessary in our grammar, considering
the fact that drastic restructuring is necessary in a rela-
tively syntactically motivated version of transformational
grammar (cf. Ross' (1967) tree pruning convention). This is the only formation rule (as opposed to sentence-level transformations) in our grammar that goes beyond those operations mentioned on p.63; this may be considered a reason enough for regarding S16 to be a transformation operating on an entire sentence. The proviso that Q be not a numeric expression Q in S16 is put there because of my relative ignorance as to what is going on when such a Q enters into a construction like (79). For instance, given:

82) san-nin-no syoonen to san-nin-no syoozyo-ga kuru
   three boy and three girl come
   "Three boys and three girls come."

it appears to me that this is not synonymous to:

83) san-nin-no syoonen to syoozyo-ga kuru
   three boy and girl come
   "Three boys and girls come."

(83) seems to invariably involve the group reading, where a group of three boys and girls are said to come. Some people may get the reading from (83) which is synonymous to (82), but at present, since we are excluding the group-level reading and since my judgment is rather shaky, I have made
S16 inapplicable to (82) (or, rather, the subject expression thereof), leaving the generation and translation of (83) up in the air.

2.4.3. Quantification and conjunction.

Funny things happen if we allow quantification into coordinate structures without any restriction. As was pointed out earlier by Rodman (1974), Montague's PTQ fragment will predict, for instance, the following to be six ways ambiguous, while in reality it is only two ways ambiguous.

84) (Rodman (1974: 171))

(19) b. Every woman loves a dog or a cat.

There is, for instance, no reading in this sentence that corresponds to:

85) There is a dog such that every woman loves it or a cat.

It appears that quantifiers in coordinate structures, for some reason, behave as if they were a single unit. In order to derive the reading (85) for (84), one has to quantify a dog with respect to the object him, which appears in the left conjunct:
86) *Every woman loves him or a cat.*

It is precisely in such a case, where quantification takes place only in one of the conjuncts, that we get an imaginary reading. Something thus has to be done to prevent a reading like (85). Rodman proposes a solution, which simply boils down to specially marking each pronoun in the conjuncts and disallowing any quantification over so marked pronouns. This ensures, in the present example, that the string *a dog or a cat* never arises through quantification, but only through conjunction (to be exact, disjunction) of T phrases *a dog* and *a cat*. The fact that (84) is only two ways ambiguous will then be a simple consequence of quantifying into the following formula with the two T phrases *every woman* and *a dog or a cat* in two different orders:

87) he$_i$ loves him$_j$.

But as Rodman notes (ibid., p.172), his pronoun marking faces difficulties when we turn to IV-conjunction and t-conjunction since examples of the following sort, which are grammatical, will also be blocked by such convention.

88) (Rodman (1974: 171, 173))

(23b) *A soldier found every student and shot him.*

(27) *A man loves the woman and she loves him, too.*
(23b), according to Rodman, is ambiguous, and there is no way to get the reading on which every has a wider scope than a unless one is allowed to quantify into coordinate IV's. Similarly, unless one can quantify into coordinate t's, (27) cannot be generated since both she and him must be bound by the woman and a man, respectively.

Parallel observations can be made in Japanese. A Rodman type example of the following sort:

89) minna-ga dareka tetugakusya to dareka ongakuka-o konomu everyone some philosopher and some musician like "Everyone likes some philosopher and some musician."

does not have, for instance, the following reading:

90) There is a particular philosopher such that everyone likes him and some musician.

The only way to have this scope relation is to quantify the T phrase dareka tetugakusya "some philosopher" over the following formula with respect to the subscripted pronoun PRO_i.
As was the case with (84), quantification must take place only in the left conjunct; the result is an ungrammatical sentence with the given reading. On the other hand, the Japanese parallel of (88) is similarly ambiguous:

92) gonin-no sensei-ga sannin-no gakusei-o tukamae-te
      five    teacher   three   student   catch

      karera-o nagutta
      them    hit

"Five teachers caught three students and hit them."

It could mean either of the following two readings:

93) a. There were five teachers who caught three students
and hit them.

b. There were three students that five teachers caught and hit.

Quantification thus apparently has to go inside coordinate structures. (The preferred reading here is any way (b).)

Judging from Rodman's examples and their Japanese parallels, it appears that something like an across the board phenomenon (in the sense of Ross (1967)) is involved in quantification: whenever quantification takes place only in the left conjunct without affecting anything in the right conjunct, we get an imaginary reading (cf. (84), (89)); whenever quantification affects both left and right conjuncts, we get actual readings (cf. (88), (92)). I propose that the following be incorporated as a meta-grammar constraint:

94) Quantification (S9) into coordinate structures is allowed only if it applies across the board.

For our present purpose, we can adopt the following characterization of "across the board".

95) Quantification (S9) is said to "apply across the board" if a subscripted pronoun \( \text{PRO}_i \) that is to be bound by Quantification occurs in each conjunct.
Since our Quantification is always on the sentential level (as opposed to PTQ's three level quantification – t-quantification, CN-quantification, and IV-quantification (cf. PTQ S14, S15, S16; cf. also section 2.5 below)), due to the consideration mentioned with respect to (64), "conjunct" in our grammar so far refers to the circled nodes below.

96) a.

b.

c.

Although I believe (94) is basically on the right track, it has a certain technically undesirable effect on
the formulation of SS7 as it interacts with Quantification. For note that in the derivation of (51) on p.237, the topmost line has been generated by quantifying たくさん no ひと "many people" into the formula \textit{PRO\textsubscript{2}-ga うたう し おどる }"PRO\textsubscript{2} sing and dance." with respect to the subject position in the left conjunct, being thus in apparent conflict with the principle of across the board quantification (94). The conflict, I believe, is only apparent; after all, PRO\textsubscript{2} is also the subject in the right conjunct in (51). Several ways out suggest themselves. We could for instance make SS7 a kind of a left node raising that Chomsky-adjoins \textit{PRO\textsubscript{i}} to the left of the sentential conjunction by \textit{si}. Or, we could propose a parallel of S9 (81) for restructuring \textit{si}-conjunction. But rather than adopt these approaches, I propose that, rather than delete the right conjunct identical subject, SS7 mark the identically subscripted \textit{PRO\textsubscript{i}} subject in the right conjunct with a feature something like [+\emptyset], which, morphophonemically interpreted, is to be realized as null. This, in a sense, is another way of stating Kuroda's (1965: Chapter IV) Zero-pronominalization, or \emptyset-pronominalization. In fact, I conjecture that should the domains of application of \emptyset-pronominalization in Japanese be made precise, we would be able to do away with SS7, which is merely one instance of such pronominalization. In the final statement of this rule, which is to be generalized later, we will incorporate this feature into SS7.
2.4.4. TV-conjunction.

Consider again the sentences in (56), repeated below as (97).

97) a. Hanako-ga takusan-no hito-o nagut-te takusan-no
       Hanako       many       people       hit-and       many
       hito-o ketta
       people       kicked
       "Hanako hit many people and kicked many people."

b. Hanako-ga takusan-no hito-o nagut-te ketta
       "Hanako hit and kicked many people."

As of now (97b) is not a member of $P_t$; but clearly (97b) is a grammatical sentence of Japanese that apparently has formal similarities to (97a). As was noted on p.240, (a) and (b) are not synonymous. In a situation where Hanako kicked a group of many people and hit another group of many people that are mutually disjoint, (a) is true while (b) is false since no group of many people have suffered both hitting and kicking. How may we generate sentences like (97b)? In the absence of Conjunction Reduction, we could use either a parallel of SS7 (with the modification noted immediately above) and mark the second $\text{PRO}_4$ with $[+\emptyset]$ and then quantify the whole formula by takusan-no hito "many people":

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98) **Hanako-ga PRO₄-o nagut-te PRO₄-o ketta**  
"Hanako hit PRO₄ and kicked PRO₄."

or introduce TV-conjunction that directly conjoins TVs, **naguru** "hit" and **keru** "kick" in this example, and forms coordinate TVs, which then may combine with **takusan-no hito** to form an IV phrase, as in:

99) **Hanako-ga** **takusan-no hito-o nagut-te keru**  :S2

```
  Hanako
  
  takusan-no hito-o nagut-te keru  :S3
  "Hanako"

  takusan-no hito  :S8
  nagut-te keru    :TV-conj.
  "many people"

  nagur-ru
  "hit"

  ker-ru
  "kick"
```

Either approach generates (97b) with the assignment of satisfactory translation. But again the first approach is not capable of handling intensional context while the second treatment, if not completely satisfactorily, can better handle such a case. Consider:

100) **Taroo-ga kappa-o sinzi-te suuhaisuru**

```
  Taroo
  kappa believe in worship

  "Taroo believes in and worships a kappa."
```

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Sinziru in the sense of "believe in" and suuhaisuru "worship" are intensional verbs; hence (100) is ambiguous between the two readings:

101) a. There is a kappa Taroo believes in and worships.
    
    b. Taroo believes in and worships a kappa (though there is no such entity as kappa).

By the same reasoning we used in establishing IV-conjunction, we are led to propose TV-conjunction for treating sentences of the above sort. Such a rule may read like:

102) S17. (TV-conjunction)

   If $\alpha, \beta \in P_{TV}$, then $F_{35}(\alpha, \beta) \in P_{TV}$, where $F_{35}(\alpha, \beta) = [\alpha', \beta']_{TV}$, where $\alpha'$ is the result of replacing Pres in $\alpha$ by te.

   T17. If $\alpha, \beta \in P_{TV}$, and $\alpha, \beta$ translate as $\alpha', \beta'$ respectively, then $F_{35}(\alpha, \beta)$ translates as $\lambda \varepsilon \lambda x[\alpha'(\varepsilon)(x) \& \beta'(\varepsilon)(x)]$.

(100) is generated in the following manner.
103) Taroo-ga kappa-o sinzi-te suuhaisuru

Translation (Some steps are omitted.):
1. kappa-o sinzi-te suuhaisuru \( \Rightarrow \)
   \[ \lambda \varphi \lambda x [\text{sinziru}'(\varphi)(x) \land \text{suuhaisuru}'(\varphi)(x)] \]
   \[ (\forall \varphi \exists y [\text{kappa}'(y) \land \varphi(y)]) \]
   : T3
2. \( \Rightarrow \lambda x [\text{sinziru}'(\forall \varphi \exists y [\text{kappa}'(y) \land \varphi(y)]) (x) \land \text{suuhaisuru}'(\forall \varphi \exists y [\text{kappa}'(y) \land \varphi(y)]) (x)] \)
   : \( \lambda \)-conversion
3. Taroo-ga kappa-o sinzite suuhaisuru \( \Rightarrow \)
   \[ \lambda Q \lambda Q(t) [\text{sinziru}'(\forall \varphi \exists \lambda y [\text{kappa}'(y) \land \varphi(y)]) (x) \land \text{suuhaisuru}'(\forall \varphi \exists \lambda y [\text{kappa}'(y) \land \varphi(y)]) (x)] \]
   : T2 (1,2)
4. \( \Rightarrow [\text{sinziru}'(t, \forall \varphi \exists \lambda y [\text{kappa}'(y) \land \varphi(y)]) \land \text{suuhaisuru}'(t, \forall \varphi \exists \lambda y [\text{kappa}'(y) \land \varphi(y)])]. \)

This represents the intensional reading; the extensional reading is derived by first taking a subscripted pronoun as

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the object of sinzi-te suuhaisuru "believe in and worship" with later quantification by kappa "kappa", which will come out, for instance, as:

104) (\exists y) [kappa'(y) \& [sinziru'*(t,y) \& suuhaisuru'*(t,y)]].

Examining this and other cases of conjunction, we see a certain pattern. Since Conjunction Reduction or Right Conjunct Identical Node Deletion (SS7) must be defined over subscripted pronouns where Ts are involved, whenever intensional contexts are involved in the formation of coordinate node A from two expressions \( \alpha, \beta (\in P_A) \), we have to resort to A-conjunction that directly conjoins \( \alpha \) and \( \beta \). Thus there would have to be as many conjunctions as there are categories of intensional context creating expressions. Furthermore, in the absence of Conjunction Reduction, we have to have conjunction like T-conjunction, which apparently has nothing to do with intensional contexts. Clearly then, the generalization that has to be expressed is that any expressions of the same syntactic category may be conjoined (so long as they are not sub-lexical items) in a human language (though there may be some language-particular exceptions). Although this is easy to state syntactically (as may be seen from the prominent position Conjunction Reduction enjoys/used to enjoy in a generative grammar), different semantic types that are involved in all kinds of conjoining make it impossible
to give one all sweeping translation rule for such a syntactic rule schema. And though I feel something ought to be done about this matter, it is far beyond my capacity and the scope of this dissertation, and I will leave it as a future task for someone to kill time with.

2.5. On dispensing with IV-quantification.

In addition to sentential quantification, PTQ grammar has a verb phrase quantification, or IV-quantification. The motivation for this is based on the necessity for a rule of quantification inside the scope of certain IV-taking intensional context creating verbs. To illustrate the point with Japanese examples, consider again the verb -itagaru "want (to)", as in the following example.

105) Taroo-ga kappa-o tukamae-te sore-ni kyuuri-o yar-itagaru
give-want (to)
"Taroo wants to catch a kappa and give it a cucumber."

This sentence is ambiguous between the two readings below that involve extensional and intensional senses respectively.
106) i. There is a certain kappa that Taroo wants to catch and give a cucumber.
   ii. It is Taroo's wish that he catch a kappa and give it a cucumber.

While the extensional reading (i) commits us to the existence of a creature called kappa, the intensional reading (ii) does not. While the first reading is easily obtained through a routine quantification by kappa into the formula below with respect to the subscripted pronoun:

107) \textit{Taroo-ga PRO\textsubscript{i}-o tukamae-te PRO\textsubscript{i}-ni kyuuri-o yar-itagaru}

the second intensional reading cannot be obtained, within PTQ framework, unless such quantification takes place into the coordinate node, which is a result of IV-conjunction:

108) \textit{PRO\textsubscript{i}-o tukamae-te PRO\textsubscript{i}-ni kyuuri-o yar-}

"(to) catch PRO\textsubscript{i} and give PRO\textsubscript{i} a cucumber"

before the verb \textit{-itagaru "want (to)"} combines with this to form another IV phrase. This would ensure that the translation of kappa appear inside the intensional context created by \textit{-itagaru "want (to)"}. 

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In view of some of the developments anticipated in the following sections, we propose that the above phenomenon be treated differently, without any use of IV-quantification that quantifies into, in the present example, a coordinate structure $[[\alpha]_IV \ [\beta]_IV]_IV$. Rather we propose that quantification be limited to sentential quantification (or t-quantification (cf. S9)). In order to achieve this (and explain some other constructions in the following sections), we employ the Japanese version of Partee's (1975) proposed rule of Derived IV, which derives a IV phrase from a sentence. The necessity for such a rule in English is based on considerations of the following sort. Given:

109) (Partee (1975: 265))

(152) Few rules are both explicit and easy to read.
(153) John wishes to see himself.

some mechanism is needed to produce the underlined parts above as independent IV phrases because the syntactic rules involved, Tough-movement and Reflexivization, operate on sentences. Take Partee's (152) for instance. Her solution is to derive a new IV phrase (c) below from a sentence with a subscripted pronominal subject (b'), which in its turn is derived by an optional application of Tough-movement on (a):

110) a. To read $\text{PRO}_i$ is easy.
b. PRO$_i$ is easy to read.
c. easy to read.

The phrase easy to read can now be combined with explicit via IV-conjunction to yield both explicit and easy to read, which may now combine with a subject T few rules to yield (152). Let us adopt a similar rule for deriving an IV phrase, and see how the intensional reading of (105) may be derived without any recourse to IV-quantification. Our proposed rule of Derived IV is:

111) S18. (Derived IV)

If $\phi \in P_T$ and $\phi$ has the form $[[[PRO_i]_T -]_l \beta]_T$, then $F_{17,i}(\phi) \in P_{IV}$, where $F_{17,i}(\phi) = [\beta]_{IV}$.

T18. If $\phi \in P_T$ and $\phi$ translates into $\phi'$, then $F_{17,i}(\phi)$ translates as $\lambda x_i \phi'$.

Given S18, a partial analysis tree for (105) that accounts for the intensional reading (106ii) can be given in the following manner:

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Thus, t-quantification has taken place (the fourth line from the top) prior to the combination of IV `kappa-o tukamae-te sore-ni kyuuri-o yar-Pres "catch-Pres a kappa and give it a cucumber"' and the verb `-itagaru "want (to)"' in the second line. In our grammar, then, although IV-conjunction is necessary, IV-quantification is not indispensable, given Derived IV (S18). Accordingly we have only one rule of quantification, that is, sentential quantification or t-quantification (S9). We will see other occasions where Derived IV (S18) is essential in accounting for some types of
constructions in later sections, and thereby confirm that S18 is not an arbitrary rule thrown in merely to get rid of IV-quantification.

2.6. Disjunction.

With the use of parallel arguments, we can establish t-disjunction, IV-disjunction, T-disjunction, and TV-disjunction (see S11, S13, S15, and S19 in the Fragment). There is nothing new in the way of argument types, and they are done away with. The structural correspondence between conjunction and disjunction assumed in the final presentation of the syntactic rules in the Fragment is as follows:

113) i. a. t-conjunction:

\[
\begin{array}{c}
t \\
\vdash \\
\triangledown \\
si \\
t \\
\vdash \\
\triangledown
\end{array}
\]

b. t-disjunction:

\[
\begin{array}{c}
t \\
\vdash \\
\triangledown \\
ka \\
t \\
\vdash \\
\triangledown
\end{array}
\]
ii. a. IV-conjunction: IV

   IV --- te --- IV

b. IV-disjunction: IV

   IV --- ka --- IV

iii. a. T-conjunction: T

   T --- to --- T

b. T-disjunction: T

   T --- ka --- T
iv. a. **TV-conjunction:**

```
  TV
 /\  \\
TV-te TV
```

b. **TV-disjunction:**

```
  TV
 /\  \\
TV-ka TV
```

For our grammar, we thus use *ka* invariably as a disjunctive particle for any type of disjunction although the actual picture is slightly more complicated.

3. **Negation.**

Formally the negation in Japanese is effected by replacing the tense marker of the main verb in a simple sentence with the negative morpheme `-anai`, which is morphologically an adjective that may be analyzed as `-ana-Pres`:

114) i. a. **Taroo-ga hasir-ru**

```
Taroo run-Pres
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```
"Taroo runs."

b. Taroo-ga hasir-anai
   Taroo run-Neg
   "Taroo does not run."

ii. a. Taroo-ga Hanako-o mi-ru
      Taroo Hanako look at-Pres
      "Taroo looks at Hanako."

b. Taroo-ga Hanako-o mi-nai
   Taroo Hanako look at-Neg
   "Taroo does not look at Hanako."

Though some morphological complexities attach to the negation of adjectives and some irregular verbs, negation as a formal process is completely regular in that it consists in the uniform replacement of the tense marker with the negative morpheme. Since the negative morpheme -anai must always appear as part of a verb or an adjective, Japanese lacks counterparts of the English expressions like:

115) a. not you but me
b. why not
   c. I guess not
d. why not

where the negative particle not is appearing "dangling". Wherever a negative morpheme -anai appears in Japanese,
there has to be some verbal element immediately preceding it.

The semantic effects of such formally innocuous negation process, on the other hand, is almost mind-boggling; to use Kuno's words, negation phenomena in Japanese are "extremely complex".38 In this section we discuss negation as it interacts with conjunction and quantification; this choice is not an arbitrary one, both in the trivial sense that our fragment grammar contains these constructions, and in the important sense that these two constructions interact with negation in entirely different manners with respect to relative scopes, thus serving as representative cases of that which makes negation in Japanese "extremely complex" and mind-boggling.

3.0. Preliminaries.

Before we discuss conjunction and quantification as they interact with negation, let us first give here a very general rule of sentence formation in Japanese that converts (a) sentences to (b) sentences below:

116) i. a. \text{Hanako-ga odoru}                    
    \hspace{1cm} Hanako dance
"Hanako dances."

b. Hanako-ga odoru no da
   Hanako dance comp. is
   (lit.) "(It) is that Hanako dances."

"Hanako dances."

ii. a. Ziroo-ga Boo-ni aitagaru
   Ziroo Bo want to meet
   "Ziroo wants to meet Bo."

b. Ziroo-ga Boo-ni aitagaru no da
   Ziroo Boo want to meet comp. is
   (lit.) "(It) is that Ziroo wants to meet Bo."

"Ziroo wants to meet Bo."

The (a) version of each pair is synonymous to the corresponding (b) version, which is the result of taking the (a) sentence as a complement to the copula da (informal) or de- aru (formal). The process can be iterated although da has to be replaced by dearu when not appearing in the major clause. Thus the following, for instance, are all synonymous to (iiia) above.

117) a. Ziroo-ga Boo-ni aitagaru no dearu no da
   comp. is comp. is

   b. Ziroo-ga Boo-ni aitagaru no dearu no dearu no da
      comp. is comp. is comp. is

   c. Ziroo-ga Boo-ni aitagaru no dearu no dearu no dearu no da
      comp. is comp. is comp. is comp. is

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Of course, the more stacking there is, the more facetious the whole sentence sounds. But the pattern is syntactically productive, converting the structure (a) to (b):

118) a. 

\[ \begin{array}{c}
  t \\
  \downarrow \\
  t \\
  \downarrow \\
  t \\
  \downarrow \\
  no \\
  \downarrow \\
  da/dearu
\end{array} \]

and often resorted to both on formal and on informal occasions by native speakers of Japanese. Kuno (1973: Chapter 19) contains informative discussion on the usage of this pattern. Let us call the process that converts (a) above to (b) Copula Complementation, which may be characterized as:

119) SS9. (Copula Complementation)

\[ \begin{array}{c}
  t \\
  \downarrow \\
  1 \\
  \downarrow \\
  1 \# no [da]_C \\
  \downarrow \\
  where \, 1 \, does \, not \, dominate \, any \, \text{PRO}_n.
\end{array} \]

TT9. Identity mapping.
The construction  \textit{t no da} somehow forms a syntactic island, and, excepting the case of topicalization by the particle \textit{wa}, no syntactic process may affect the internal structure of \textit{t} in \textit{t no da}. Relative Clause Formation (cf. p.94), which is in general not subject to Ross' Complex NP Constraint in Japanese (cf. Chapter VI), cannot apply here:

120) a. \textit{[Taro-o ga kaita]_{t} e [Taro-o drew]_{t} picture}
   "picture Taroo drew"

   b. \*[[Taro-o ga kaita]_{t} no na]_{t} e [[Taro-o drew]_{t} comp. is]_{t} picture

   c. \*[[Taro-o ga kaita]_{t} no dearu]_{t} e [[Taro-o drew]_{t} comp. is]_{t} picture

The condition to SS9 above is our way of stating such islandhood of this construction though it is quite likely that some further syntactic conditions on this transformation will be found necessary.

3.1. Conjunction and negation.

3.1.1. \textit{T}-conjunction and negation.

Consider sentences like the following, each of which
is ungrammatical on the asterisked reading:

121) a. Ziroo to Hanako-ga utaw-anai
    Ziroo and Hanako   sing-Neg
    i. "Neither Ziroo nor Hanako sings."
    ii. "Not both Ziroo and Hanako sing."

b. Ziroo-ga Hanako to Taroo-o nagur-anai
    Ziroo   Hanako and Taroo   hit-Neg
    i. "Ziroo hits neither Hanako nor Taroo."
    ii. "Ziroo does not hit both Hanako and Taroo."

That is, the reading on which the negative has a wider scope than T-conjunction is not present in these examples. This is confirmed by the absurdity of continuing (a) and (b) above by (a) and (b) below, respectively.

122) a. sikasi Hanako-ga utau
    but   Hanako   sing
    "But Hanako sings."

b. sikasi Ziroo-ga Hanako-o naguru
    but   Ziroo   Hanako   hit
    "But Ziroo hits Hanako."

The point is further confirmed by si-conjoining these sentences, which we find contradictory:
123) a. Ziroo to Hanako-ga utaw-anai si Hanako-ga utau
    Ziroo and Hanako sing-Neg and Hanako sing
    "Ziroo and Hanako do not sing, and Hanako sings."

   b. Ziroo-ga Hanako to Taroo-o nagur-anai si Ziroo-ga
      Hanako and Taroo hit-Neg and Ziroo
      Hanako-o naguru
      Hanako hit
      "Ziroo does not hit Hanako and Taroo, and Ziroo
      hits Hanako."

If negation were simply to apply blindly to any t so that
the affirmative versions of (121) (a), (b) got converted to
the corresponding negative versions, we would expect that
(121) (a) and (b) to be both ambiguous between the two read­
ings given there. Take for instance (121a). It may be
generated in either of the following two fashions that
 correspond to the two readigns. (Recall that whichever gets
introduced first in the analysis tree has a narrower scope.)

124) a. (= (121a), reading (i))

    Ziroo to Hanako-ga utaw-anai  :S9
        /                  /
      Ziroo to Hanako  :S14    PRO_4-ga utaw-anai  : (Negation)
        |                   /          |
      Ziroo      Hanako     PRO_4-ga utaw-Pres

"Ziroo"    "Hanako"    "PRO_4 sings."

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Thus we must somehow restrict the grammar so that (124b) will not be generated. Though a number of treatments suggest themselves, a purely syntactic solution seems most natural since there is nothing wrong or strange or odd in semantically denying the proposition of the form \([p \& q]\). We propose the following rule of negation for our grammar of Japanese.

125) S20. (Negation)

If \(\phi \in P_t\) and is analyzable as \(X-\text{Pres}\), where \(X\) does not contain any coordinate node, then \(F_{19}(\phi) \in P_t\), where \(F_{19}(\phi) = X-\text{Neg-Pres}\).

T20. If \(\phi \in P_t\) and translates as \(\phi'\), then \(F_{19}(\phi)\) translates as \(-\phi'\).
We will need some further modification of S20 when we get to quantification and negation in section 3.2, but for the time being S20 is satisfactory for our purpose. Note that the restriction on the coordinate node encoded into S20 is necessary regardless of whether we adopt Conjunction Reduction approach or T-conjunction approach to coordinate T nodes; in either approach, the second line from the top of (124b) is generated. The restriction forbids the conversion of this line to the top line in (124b) because of the coordinate nodes Ziroo and Hanako. A partial simplified translation for the analysis tree (124a) is:

\[
\begin{align*}
1. \text{PRO}_4-\text{ga utaw-Pres} & \implies \text{utau}'(x_4) \\
2. \text{PRO}_4-\text{ga utaw-anai} & \implies -\text{utau}'(x_4) : T20 \\
3. \text{Ziroo to Hanako} & \implies \lambda P[\lambda Q Q(z)(P) \land T_{14} \\
4. & \implies \lambda P[\forall P(z) \land \forall P(h)] : \lambda-\text{conversion,} \\
& \quad \text{Down-Up} \\
& \quad \text{Cancellation} \\
5. \text{Ziroo to Hanako-ga utaw-anai} & \implies \lambda P[\forall P(z) \land \forall P(h)](\lambda x_4-\text{utau}'(x_4)) : T9 (2,4) \\
6. & \implies \lambda x_4-\text{utau}'(x_4)(z) \land \lambda x_4-\text{utau}'(x_4)(h) : \lambda-\text{conversion} \\
7. & \implies \lambda x_4-\text{utau}'(x_4)(z) \land \lambda x_4-\text{utau}'(x_4)(h) : \text{Down-Up} \\
& \quad \text{Cancellation}
\end{align*}
\]
8. $\rightarrow -$\text{utau'}(z) & -$\text{utau'}(h)$  :Down-Up

Cancellation

In order to express the reading (ii) of (121), Japanese has to resort to SS9 (Copula Complementation):

127) a. [Ziroo to Hanako\text{-}ga utau]$ t $ no de-nai
[Ziroo and Hanako sing]$ t $ comp. be-Neg
"(It) is not that Ziroo and Hanako sing."

b. [Ziroo\text{-}ga Hanako to Taroo\text{-}o naguru]$ t $ no de-nai
[Ziroo Hanako and Taroo hit]$ t $ comp. be-Neg
"(It) is not that Ziroo hits Hanako and Taroo."

(127a), for instance, is derived in the following fashion.

128) [Ziroo to Hanako\text{-}ga utau]$ t $ no de-Neg-Pres :S20

$\frac{[Ziroo to Hanako\text{-}ga utau]$ t $ no da-Pres}{Ziroo to Hanako\text{-}ga utau}$ :SS9

Translation:

1. Ziroo to Hanako\text{-}ga utau $\rightarrow$ utau'(z) & utau'(h)

2. [Ziroo to Hanako\text{-}ga utau]$ t $ no da $\rightarrow$
\hspace{1cm} utau'(z) & utau'(h) :TT9

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3. \[\text{Ziroo to Hanako-ga utau},\text{t no de-nai} \implies \neg [\text{utau'}(z) \& \text{utau'}(h)]\] :T20

Note that we cannot quantify T phrase Ziroo to Hanako "Ziroo and Hanako" into the following formula with respect to the complement pronominal subject since the formula is never generated in the grammar, i.e., it is ungrammatical, because of the condition attached to SS9.

129) \[\text{[PRO}_6\text{-ga utau},\text{t no de-nai} \quad [\text{PRO}_6\text{ sing},\text{t comp. be-Neg}]

"(It) is not that PRO}_4\text{ sings."

Hence in sentences like (127) (a) and (b), the negative always has a wider scope than the conjunction.

3.1.2. IV-conjunction and negation.

Consider the following sentences:

130) \text{Hanako-wa isya de bengosi da}^{42}

Hanako doctor be+and lawyer is
"Hanako is a doctor and a lawyer."

IV's may be negated in three different ways:
131) a. **Hanako-wa isya de bengosi de-nai**  
   **Hanako doctor be+and lawyer be-Neg**  
   "Hanako is a doctor and is not a lawyer."

b. **Hanako-wa isya de-naku-te bengosi da**  
   **Hanako doctor be-Neg-and lawyer is**  
   "Hanako is not a doctor and (i.e., but) a lawyer."

c. **Hanako-wa isya de-naku-te bengosi de-nai**
   **Hanako doctor be-Neg-and lawyer be-Neg**  
   "Hanako is not a doctor and is not a lawyer."

These all differ in meanings, and, furthermore, none of them semantically corresponds to the negation of (130). The negative sense of (130) has to be expressed by either of the following two ways.

132) a. **[Hanako-ga isya de bengosi na] no de-nai**  
   **[Hanako doctor be+and lawyer is] comp. be-Neg**  
   "(It) is not that Hanako is a doctor and a lawyer."

b. **Hanako-wa isya de-nai ka bengosi de-nai**
   **Hanako doctor be-Neg or lawyer be-Neg**  
   "Hanako either is not a doctor or is not a lawyer."

The generation of (132a) should pose no problem, the analysis tree more or less paralleling that in (128) where negation is concerned. Since our Negation S20 cannot operate on a sentence that contains a coordinate node, the generation of
(131) (a) – (c) and (132b) may not be so obvious, but these are all predicted to be grammatical with correct assignment of corresponding translations in our grammar. The key to their generation is Derived IV S18 (p.271). I will show how our grammar will generate (131b) with the correct assignment of its translation below; the other sentences can be generated in a parallel manner.

133) (= (131b))

```
Hanako-ga isya da-Neg-te bengosi da-Pres :S2
  
  Hanako isya da-Neg-te bengosi da-Pres :S12
  "Hanako"
   
   isya da-Neg-Pres :S18 bengosi da-Pres :S6
     
     PRO8-ga isya da-Neg-Pres :S20 bengosi
     "lawyer"
  
  PRO8-ga isya da-Pres :S2
     
     PRO8 isya da-Pres :S6
     "PRO8"
       
       isya
       "doctor"
```

Translation:

1. \( \text{PRO8-ga isya da} \implies \text{isyax}_8 \)
2. \( \text{PRO}_g \text{-ga isya de-nai} \implies -\text{isya'}(x_g) \): T20

3. \( \text{isya de-nai} \implies \lambda x_g \text{-isya'}(x_g) \): T18

4. \( \text{isya de-naku-te bengosi da} \implies \lambda x[\lambda x_g \text{-isya'}(x_g)(x) \& \text{bengosi'}(x)] \): T12 (2,3)

5. \( \lambda x[\text{-isya'}(x) \& \text{bengosi'}(x)] \): \(\lambda\)-conversion

6. \( \text{Hanako-ga isya de-naku-te bengosi da} \implies \lambda P^P(h)(\lambda x[\text{-isya'}(x) \& \text{bengosi'}(x)](x)) \): T2

7. \( \lambda P^P(h)(\lambda x[\text{-isya'}(x) \& \text{bengosi'}(x)](h)) \): \(\lambda\)-conversion

8. \( \lambda x[\text{-isya'}(x) \& \text{bengosi'}(x)](h) \): Down-Up Cancellation

9. \( \lambda P^P(h)(\lambda x[\text{-isya'}(x) \& \text{bengosi'}(x)](h)) \): \(\lambda\)-conversion

3.1.3. \(\tau\)-conjunction and negation:

The only possible forms of negation of (a) are (b) and (c), the latter being semantically equivalent to (b) by de Morgan's law.

134) a. \( \text{Hanako-ga utat-te Ziroo-ga odoru} \)
\( \text{Hanako sing-and Ziroo dance} \)
"Hanako sings and Ziroo dances."

b. \( [\text{Hanako-ga utat-te Ziroo-ga odoru}]_t \text{ no de-(wa) nai} \)
\( [\text{Hanako sing-and Ziroo dance}]_t \text{ comp. is Neg} \)
"(It) is not that Hanako sings and Ziroo dances."

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c. Hanako-ga utaw-anai ka Ziroo-ga odor-anai
   Hanako sing-Neg or Ziroo dance-Neg
   "Hanako does not sing or Ziroo does not dance."

The following, for instance, are not synonymous to (a) above.

135) a. Hanako-ga utat-te Ziroo-ga odor-anai
   Hanako sing-and Ziroo dance-Neg
   "Hanako sings, and Ziroo does not dance."

b. Hanako-ga utaw-anaku-te Ziroo-ga odor-anai
   Hanako sing-Neg-and Ziroo dance-Neg
   "Hanako does not sing, and Ziroo does not dance."

These are all predicted to be so since conjunction always takes a wider scope than negation unless Neg asymmetrically commands the conjunctive particle as in (134b). The generation of (134b) may be roughly sketched as follows.

136) \[Hanako-ga utat-te Ziroo-ga odoru]_t no de-nai :S20

   \[Hanako-ga utat-te Ziroo-ga odoru]_t no da :SS9

   Hanako-ga utat-te Ziroo-ga odoru :S10ii

   Hanako-ga uta-u          Ziroo-ga odor-u
   "Hanako sings."           "Ziroo dances."
Translation:

1. **Hanako-ga utat-te Ziroo-ga odoru**
   \[\Rightarrow utau'(h) \& odoru'(z)\] :T10

2. **[Hanako-ga utat-te Ziroo-ga odoru]_t no da**
   \[\Rightarrow utau'(h) \& odoru'(z)\] :TT9

3. **[Hanako-ga utat-te Ziroo-ga odoru]_t no de-nai**
   \[\Rightarrow \neg[utau'(h) \& odoru'(z)]\] :T20

3.1.4. Possible and impossible readings.

Recall that on pp.170ff I have adopted the policy of regarding the determination of which is to be the preferred, or dominant, or possible reading of the Q scopes of a given sentence something over and above the grammar proper. A similar point may be raised about the scopes of T-conjunction and negation. While the remarks made above about the relative scopes of IV-conjunction/t-conjunction and negation, I believe, are absolutely correct, having no exception, I am not so sure about the relative scopes of negation and T-conjunction. Though the point may be greatly affected by other considerations as well, as opposed to (123a), for instance, the following sounds all right.

137) **Ziroo to Hanako-ga utaw-anai-de Hanako-ga utau**

*Ziroo and Hanako sing-Neg-and Hanako sing*
"Ziroo and Hanako do not sing, and Hanako sings."

The sentence does not sound as contradictory as (123a) does. Thus the left conjunct may possess the reading:

138) It is not the case that both Ziroo and Hanako sing.

which, it was pointed out, has to be expressed by (127a). Furthermore, (a) below, as opposed to (137), is completely grammatical, while the corresponding si-conjunction (b) is still bad.

139) a. Ziroo to Hanako-ga utaw-anai-de Hanako-dake-ga utau
   Ziroo and Hanako  sing-Neg-and Hanako-only    sing
   "Ziroo and Hanako do not sing, and only Hanako sings."
   b. Ziroo to Hanako-ga utaw-anai si Hanako-dake-ga utau

That (138) reading is ever possible at all may thus indicate that sentences like (121) are actually semantically ambiguous as to the relative scopes of T-conjunction and negation, the determination of the preferred reading being controlled by non-semantic factors. And if this is to be the case, the condition that is attached to S20 may have to be better replaced by the following:

140) ..., where Pres is not commanded by any coordinate node t, IV, or TV, then ...
S20 (Negation) thus modified would be equivalent to the standard treatment whereby Neg is made to negate only a simple sentence in the deep structure.

3.2. **Quantification and negation.**

3.2.1. **Relative scopes of Qs and negation.**

Unlike the interaction of conjunction and negation as we saw above, Qs and negation do manifest scope ambiguity within a simple sentence. Or to quote Kuno (1980: 77):

141) The ... claim that the negative morpheme nai has within its scope only the verb, adjective, or "X desu" which is immediately to its left, has an important class of exceptions. It seems that quantifiers can be within the scope of the negation regardless of where they appear in the sentence.

(For the purpose of our discussion, we may equate Kuno's X desu construction with our t no da though the former covers a wider range of constructions: recall that desu is a polite form of da.) Kuno's position above, when rephrased in our terms, is simply this: Negation always takes the narrowest scope possible except when 1) t no da is negated, in which
case the formula $t$ must be semantically negated, or 2) $Qs$ and Neg command each other, in which case scope ambiguity results.

Consider, for instance, (b) below, which is a negative version of (a).

142) a. minna-ga kuru
   everyone come
   "Everyone comes."

   b. minna-ga ko-nai
      everyone come-Neg
      "Everyone does not come."

It is to be noted that (b) is ambiguous between the two readings below though, as usual, the preferred reading is (a).

143) a. No one comes.

   b. Not everyone comes.

One context where (b) reading comes to the foreground most easily would be a situation where Prof. Yamada normally expects all his registered students to come to his class but finds not many of them in the class. We may then describe Prof. Yamada's disappointment as:
minna-ga ko-nai no-de Yamada-sensei-wa gakkari-site-iru
everyone come-Neg because Prof. Yamada is disappointed
"Prof. Yamada is disappointed because not everyone comes
(to his class)."

Clearly (142b) means (143b) in (144). In general, where Qs
and Neg appear in a simple sentence, we have to be able to
predict two different readings depending on the relative scope
of such Q and Neg. It is to be noted that such a state of
affairs does not constitute a complication in the grammar,
but exactly what is to be expected if Neg semantically negates
a formula and if quantified expressions are semantically sets
of properties.

Montague's PTQ (p.252) directly introduces the negation
as part of a sentence formation from subject and predicate;
it is very much like forming (c) from (a) and (b) below:

145) a. everyone
    b. come
    c. everyone does not come

Some advantages of such a rule of negation for English are
1) the direct generation of well-formed formulas, and 2) the
direct specification of the relative order of formatives like
Neg and Past, which can be taken care of once and for all by
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a set of rules of this type. Disadvantages are, of course, latent: once the grammar is enlarged to cover various syntactic constructions, Neg as a single syntactic constituent will become necessary for English to account for various positions it appears in in expressions like:

146) a. Not everyone comes.
    b. I hope not.
    c. I do not think anyone came.
    etc.

So far as Montague's PTQ fragment is concerned, the choice between the two approaches in forming negative sentences may be considered not so much a matter of theory as a matter of arbitrary choice. But we cannot adopt the PTQ approach in forming our negation rule. This is so because of rules like SS9 (Copula Complementation) where we form a new sentence from a sentence; if negation is formulated as part of sentence formation based on subjects and predicates, we will have no chance of negating the verb da that is introduced in this transformation. Thus it seems most natural, as we do, to take negation to be a process that forms a new formula from another formula.47

I now illustrate how scope ambiguity between Qs and negation may be predicted within our grammar with the
following sentence by means of two sample partial analysis trees. (Recall that whichever gets introduced later in the analysis tree has a wider scope.)

147) minna no zyoyuu-ga odor-anai
    every actress dance-Neg
    "Every actress does not dance."

a. (Neg has a narrower scope than Q.)

```
  minna no zyoyuu-ga odor-anai :S9
   
    minna no zyoyuu :S8  PRO_ga odor-anai :S20
     
      minna  zyoyuu    PRO_ga odor-ru :S2
      "every"  "actress"
```

b. (Neg has a wider scope than Q.)

```
  minna no zyoyuu-ga odor-anai :S9
     
    minna no zyoyuu-ga odor-ru :S2
      
       minna no zyoyuu :S8  odor-ru
       "every"  "actress"  
          PRO_6  "dance-Pres"
```

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We further note that the following has only one reading, which is equivalent to (b) above; that this has only one reading is an automatic consequence of the condition attached to SS9.

148) 

\[
\text{minna no zyoyuu-ga odoru} \quad \text{no de-nai}
\]

\[
\text{[every actress dance] comp. be-Neg}
\]

"(It) is not that every actress dances."

In fact, between (147) and (148), the latter is the preferred sentence pattern to express (147b) reading since, unless contextual demands force it otherwise, (147) tends to be semantically associated with (147a) reading.

3.2.2. Polarity-sensitive Qs.

Indefinite Qs show polarity-sensitivity controlled by the relative scopes of Qs and negation, as in the following alternation of dareka "some(one)" and daremo "any (one)":

149) a. 

\[
dareka gakusei-ga odor-ru
\]

\[
\text{some student dance-Pres}
\]

"Some student dances."
b. dareka gakusei-ga odor-anai
    some student dance-Neg(-Pres)
"Some student does not dance."
*"No student dances."

c. daremo gakusei-ga odor-anai
    any student dance-Neg(-Pres)
(lit.) "Any student does not dance."
"No student dances."
*"Some student does not dance."

d. (= Q-floated version of (b))⁵₀
    gakusei-ga dareka odor-anai
    "Some student does not dance."
*"No student dances."

e. (= Q-floated version of (c))⁵₀
    gakusei-ga daremo odor-anai
    "No student dances."
*"Some student does not dance."

Since (d), (e) are semantically equivalent to (b), (c) respectively, let us consider (a), (b), (c) as above. Their respective translations are equivalent to (a), (b), (c) below:

150) a. (x)[gakusei'(x) & odoru'(x)]
b. (x)[gakusei'(x) & -odoru'(x)]
c. -(x)[gakusei'(x) & odoru'(x)]
Thus the phenomenon itself is pretty much reminiscent of some-any alternation in English. Whenever a negative takes a wider scope than the existential, dareka has to be changed to daremo. Accordingly we revise Negation S20 in such a way that it affects every indefinite Q whenever it is within the scope of negation.

151) S20. (Negation)

If $\phi \in P_t$ and is analyzable\(^{40}\) as X-Pres, where X does not contain any coordinate node\(^{41}\), then $F_{19}(\phi) \in P_t$, where $F_{19}(\phi) = X'_{-\text{Neg-Pres}}$, where X' is the result of replacing every indefinite Q (dare-ka) that commands Pres in X-Pres by its corresponding negative form (dare-mo).

T20. If $\phi \in P_t$ and translates as $\phi'$, then $F_{19}(\phi)$ translates as $\neg \phi'$.

Partial analysis trees for (149b) and (149c) are thus:

152) a. (= (149b))

```
  dareka gakusei-ga odor-anai :S9
     dareka gakusei :S8 PRO₄-ga odor-anai :S20
        "some student"
          PRO₄-ga odor-ru
            "PRO₄ dances."
```
b. (= (149c))

$daremo \text{gakusei-ga odor-anai}$ :S20

$dareka \text{gakusei-ga odor-ru}$ :S2

$dareka \text{gakusei} \quad \text{odo-ru}$ :S8

"some student" "dance-Pres"

We note that the following, though semantically equivalent to (149c), retains the form $dareka$ because of the "command" condition in S20:

153) $[dareka \text{gakusei-ga odoru}]_t \text{ no de-nai}$

$[\text{some student dance}]_t \text{ comp. be-Neg}$

"(It) is not that some student dances."

$[dareka \text{gakusei-ga odoru}]_t \text{ no de-nai}$ :S20

$[dareka \text{gakusei-ga odoru}]_t \text{ no da-Pres}$ :SS9

$dareka \text{gakusei-ga odoru}$

"Some student dances."

Translation:

1. $\text{dareka gakusei-ga odoru} \Rightarrow (\exists x)[\text{gakusei'(x)}$

$& \text{ odoru'(x)}]$

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2. \([\text{dareka gakusei-ga odoru}]_t \text{ no da-Pres}\)
   \[\implies (\exists x)[\text{gakusei}'(x) \land \text{odoru}'(x)]\] : TT9

3. \([\text{dareka gakusei-ga odoru}]_t \text{ no de-nai}\)
   \[\implies \lnot (\exists x)[\text{gakusei}'(x) \land \text{odoru}'(x)]\] : T20

Although there are certain further complications when \text{dareka} "some(one)" and other indefinite Qs, after having been converted to a syntactic T (due to SS2 in case of \text{dareka}), are changed to the corresponding negative forms, these I believe belong to morphological adjustments, and hence are not treated in the syntax. 51

4. **Obligatory equi-NP predicate constructions.**

4.0. **Preliminaries.**

In this section we will discuss those constructions that involve the use of those predicates that require the obligatory application of so-called Equi-NP Deletion (or obligatory equi-NP predicates) in the standard literature; constructions that involve the optional application of Equi-NP Deletion are separately discussed in Appendix C. And hereinafter, unless otherwise mentioned, "equi-NP" and "obligatory equi-NP" are to be understood to be synonymous.
Since we do not allow any obligatory rule application in our grammar, the standard treatment of obligatory equi-NP predicate constructions is not to be examined fully in what follows; rather, alternative analyses are sought that are more consonant with our overall approach.

A variety of semantic classes participate in equi-NP predicate constructions; we will take up below two cases that semantically have to do with individuals in one way or another and leave the rest to future integration. They are:

154) i. subject-equi (SE)

\[
\text{Taroo-ga Hanako-o nagur-itagaru}\\
\text{Taroo Hanako hit-want (to)}\\
\text{"Taroo wants to hit Hanako."}
\]

ii. object-equi (OE)

\[
\text{Taroo-ga Hanako-o odor-aseru}\\
\text{Taroo Hanako dance-cause}\\
\text{"Taroo causes Hanako to dance."}
\]

The fundamental difference between SE and OE lies in the fact that in SE, the semantic subject of the complement predicate (naguru "hit" in the present example) is the matrix subject (Taroo) while in OE, the semantic subject of the complement predicate (odoru "dance" in the present example) is the matrix object (Hanako). Otherwise both SE and
OE seem to share similar structural properties. Particularly notable is the clausemate-hood of Taroo and Hanako in either example above. That they are indeed clausemates may be seen from considerations like the following. First, note that they may change their respective orders by Scrambling:

155) a. (= scrambled version of (154i))

    Hanako-o Taroo-ga nagur-itagaru

b. (= scrambled version of (154ii))

    Hanako-o Taroo-ga odor-aseru

Second, observe that (154ii) passivizes[^3]:

156) Hanako-ga Taroo-ni odor-ase-rareru

    Hanako  Taroo-by dance-cause-Pass
    "Hanako is made to dance by Taroo."

As in English, the object to be promoted to the subject in passivization must be clausemates with the original subject.

Third, note that dareka must be changed to daremo in negation in the position Hanako occupies in (154) (cf. S20).

157) a. Taroo-ga daremo syoonen-o nagur-itagar-anai

    Taroo   any   boy   hit-want (to)-Neg

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"Taroo does not want to hit any boy."

b. Taroo-ga daremo syoozyo-o odor-ase-nai
Taroo any girl dance-cause-Neg
"Taroo does not make any girl dance."

The substitution of dareka "some(one)" for daremo "any(one)" in these examples will make them ungrammatical on the intended readings.

Our task is then to semantically account for the facts noted above and to syntactically give the following structures for sentences in (154).

158)

We discuss SE and OE in this order below.
4.1. **Subject-equi.**

It appears that facts noted above follow most naturally within our framework if we assume, as we have done already on several occasions, an expression like -itagaru "want (to)" to be an IV-taking word to form another expression of the category IV.

\[ B_{IV/IV} = \{ -itagar-Pres, -yoo to su-Pres \} \]

("want (to)", "try (to)"

S21. **(Subject-Equi)**

If \( \alpha \in P_{IV/IV}, \beta \in P_{IV} \) and \( \beta \) has the form \( X-Pres \}_{IV}^{54} \), then \( F_{20}(\alpha, \beta) \in P_{IV} \), where \( F_{20}(\alpha, \beta) = X-\alpha \}_{IV} \).

T21. If \( \alpha \in P_{IV/IV}, \beta \in P_{IV} \) and \( \alpha, \beta \) translate as \( \alpha', \beta' \) respectively, then \( F_{20}(\alpha, \beta) \) translates as \( \alpha'(\beta') \).

(154i) is then generated in the following fashion.

160) \[ [Taroo-ga Hanako-o nagur-itagaru]_{t} :S2 \]

\[ Taroo \]

\[ [Hanako-o nagur-itagaru]_{IV} :S21 \]

"Taroo"

\[ [Hanako-o nagur-Pres]_{IV} :S3 -itagaru \]

Hanako

nagur-Pres

"Hanako"

"hit-Pres"

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Translation:

1. Hanako-o naguru \( \rightarrow \) naguru'\( (^\lambda P^\downarrow P(h)) \) :T3

2. Hanako-o nagur-itagaru \( \rightarrow \)
   
   tagaru'\( (^\lambda P^\downarrow P(h)) \) :T2

3. Taroo-ga Hanako-o nagur-itagaru \( \rightarrow \)
   
   \( \lambda Q^\downarrow Q(t)(^\text{tagaru'}(^\text{naguru'}(^\lambda P^\downarrow P(h)))) \) :T2

4. \(-\rightarrow\) \( ^\text{tagaru'}(^\text{naguru'}(^\lambda P^\downarrow P(h))(t)) \) \( :\lambda\)-conversion

5. \(-\rightarrow\) \( \text{tagaru'}(^\text{naguru'}(^\lambda P^\downarrow P(h))(t)) \) \( :\text{Down-Up} \)
   
   Cancellation

6. \(-\rightarrow\) \( \text{tagaru'}(t,^\text{naguru'}(^\lambda P^\downarrow P(h))) \) \( :\text{Relation} \)
   
   Notation

The derivation thus shows that Taroo stands in tagaru "want (to)" relation to the property of hitting Hanako. The top line of the analysis tree is structurally equivalent to (158).

A sentence like the following:

161) minna-ga zibun-o seme-tagaru

everyone self accuse-want (to)

"Everyone wants to accuse himself."

may be generated in the following fashion (among other equivalent derivations).
Translation:

1. \( \text{PRO}_2 \text{-ga zibun-o semeru} \Rightarrow \text{semeru}'^x(x_2,x_2) \)

2. \( \text{zibun-o semeru} \Rightarrow \lambda x_2' \text{semeru}'^x(x_2,x_2) \) : T18

3. \( \text{zibun-o seme-tagaru} \Rightarrow \text{tagaru}'(\wedge\lambda x_2' \text{semeru}'^x(x_2,x_2)) \) : T21

4. \( \text{minna no hito} \Rightarrow \lambda P(\forall x)[\text{hito}'(x) \rightarrow \forall P(x)] : T8 \)

5. \( \text{minna no hito-ga zibun-o seme-tagaru} \Rightarrow \)

\[ \lambda P(\forall x)[\text{hito}'(x) \rightarrow \forall P(x)](\wedge \text{tagaru}' \)

\[ (\wedge\lambda x_2' \text{semeru}'^x(x_2,x_2))) \) : T2

6. \( \Rightarrow (\forall x)[\text{hito}'(x) \rightarrow \text{tagaru}'(x,\wedge\lambda x_2' \text{semeru}'^x(x_2,x_2))] \)

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7. \textit{minna-ga zibun-o semetagaru} \implies \\
\begin{align*}
(\forall x)[\text{hito}'(x) \to \text{tagaru}'(x, \lambda x_{2}\text{semeru}'_{*})] \\
(x_{2}, x_{2})
\end{align*}
\tag{TT2}

The derivation indicates that every person is such that he stands in \textit{tagaru} "want (to)" relation to the property of accusing oneself. Note that this is different from:

\begin{enumerate}
\item 163) \textit{minna-ga minna-o seme-tagaru}
\item and the grammar predicts such to be the case, the derivation of (163) paralleling mutatis mutandis that of (154i) (given in (160)), yielding the translation equivalent to:
\end{enumerate}

\begin{align*}
164) (\forall x)[\text{hito}'(x) \to \text{tagaru}'(x, \lambda \text{semeru}'(\lambda \forall y)\text{hito}' \to P(y))])
\end{align*}

which says that every person is such that he stands in \textit{tagaru} "want (to)" relation to the property of accusing every person.

\subsection{Object-equi.}

Though there are many verbs that take the construction (154ii), I will discuss for this grammar below only causative
constructions, for 1) I believe that causative constructions constitute the prime case of obligatory object-equi in Japanese, 2) much of past syntactic analyses was devoted to them in Japanese, and 3) other cases of obligatory object-equi more or less follow the pattern of causatives and hence should present nothing of theoretical significance. For an excellent synopsis and criticism of various approaches to the syntax and semantics of causative constructions, see Tonoike (1979: Chapter IV).

4.2.1. Causative constructions.

There are two types of causative constructions; based on the kind of particle that is attached to the matrix object, they are known by the names _-causative and ni-causative:

165) a. Hanako-ga Taroo-o utaw-ase-ta
   Hanako  Taroo  sing-cause-Past
   "Hanako made Taroo sing."

b. Hanako-ga Taroo-ni utaw-ase-ta
   Hanako  Taroo  sing-cause-Past
   "Hanako let Taroo sing."

There are two major standard analyses of the causative constructions, which are referred to by Tonoike (1979: 144f) as
ni-extra NP analysis and o-extra NP analysis. The ni-extra NP analysis posits an extra NP in the matrix sentence of the ni-causative deep structure, while the o-extra NP analysis does exactly the opposite; it posits an extra NP in the matrix sentence of the o-causative deep structure. Thus the respective deep structures of these positions for (a) and (b) above would be the following.56 (I omit the particles.)

166) i. ni-extra NP analysis

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What is common syntactically to both of these approaches is:
1) the causative verb takes a complement, 2) where there is an extra NP, the complement subject must be coreferential to this NP, 3) where there is an extra NP, the coreferential subject must be obligatorily equi-deleted, and 4) Verb Raising must obligatorily raise the complement predicate (or rather the stem thereof) and make it part of the matrix verb saseru. Basic to these properties is the assumption that there are syntactically at least two verbs saseru₁ and saseru₂,
both meaning essentially "cause", that take different syntactic structures. Rather than discuss relative merits and demerits of these approaches, which task is excellently carried out by Tonoike (1979: Chapter IV), we present below our syntactic analyses that possess none of the properties (1) – (4) above in conformity to our position that every expression of any syntactic category is well-formed and that a grammar may not allow any obligatory rule application in syntax. Then we will propose our translations for both types of causatives.

4.2.2. A proposed syntax of causative constructions.

As with most approaches, we assume two causative verbs saseru₁ and saseru₂; for convenience, we let saseru₁ take the ni-causative construction, and saseru₂ the o-causative construction. Furthermore, as with -itagaru of subject-equ, we consider both saseru₁ and saseru₂ to be verbal suffixes, i.e., -saseru₁ and -saseru₂. We can then regard both of these causative suffixes to be of the syntactic category TV/IV, or (IV/T)/IV to be precise, that is, -saseru₁ and -saseru₂ both take an expression of category IV and form an expression of category TV. They thus derive new transitive verbs from IV-phrases. Since the TV's in Japanese take either o or ni for marking objects (though o-taking TV's far outnumber ni-taking
TV's) as in:

167) i. o-marked DO

a. Hanako-ga Taroo-o naguru
   Hanako  Taroo  hit
   "Hanako hits Taroo."

b. Hanako-ga Taroo-o miru
   Hanako  Taroo  see
   "Hanako sees Taroo."

ii. ni-marked DO

a. Hanako-ga Taroo-ni katu
   Hanako  Taroo  win
   "Hanako beats Taroo."

b. Hanako-ga Taroo-ni makeru
   Hanako  Taroo  lose
   "Hanako loses *(to) Taroo."

we may regard the verbal complex IV-saseru₁ to be a ni-taking TV and IV-saseru₂ to be an o-taking TV. Both ni-causatives and o-causatives are then derivable in a completely parallel manner, the syntactic difference being only in the choice of the object particle. Supplying the particles, the sentences of (165) may be generated roughly as follows:
We propose then the following rule of causative formation with the corresponding rule of translation. 59

169) S22. (Causative or Object-Equi)

If $\alpha \in P_{IV}$, $\beta \in P_{TV/IV}$, and $\alpha$ has the form $X-Pres]_{IV}$, then $F_{37}(\beta, \alpha) \in P_{TV}$, where $F_{37}(\beta, \alpha) = X-\beta]_{TV}$.  

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T22. If $\alpha \in P_{IV}$, $\beta \in P_{TV/IV}$, and $\alpha$, $\beta$ translate as $\alpha'$, $\beta'$ respectively, then $F_{37}(\beta, \alpha)$ translates as $\beta'(\alpha')$.

4.2.3. A proposed translation for $\text{-saseru}_1$ and $\text{-saseru}_2$.

Although a number of semantic criteria have been proposed for distinguishing the o-causative and the ni-causative, none seems completely satisfactory, and I agree basically with Tonoike's observation$^{60}$ that "... the only generalization that can be made about the two causatives is Kuno's and Harada's (and originally McCawley's) observation that the ni-causative requires a self-controllable verb in the complement. ... The ni-causative represents a causation involving a self-controllable action, whereas the o-causative represents causation in general." Though even this is not without counterexamples$^{61}$, something like this seems to be the very basic distinction between the two causatives, being able to account for majority of paradigm cases like:

170) i. o-causative

a. Taroo-ga Hanako-o kanasim-aseru$_2$

Taroo Hanako grieve-cause
"Taroo makes Hanako grive (over something)."
b. Hanako-ga yasai-o kusar-aseru₂
   Hanako   vegetable rot-cause
   "Hanako causes vegetable to rot."

ii. ni-causative

   a. *Taroo-ga Hanako-ni kanasim-aseru₁
   b. *Hanako-ga yasai-ni kusar-aseru₁

Note that under normal circumstances, "grieving" and "rotting" do not represent self-controllable actions; accordingly ni-causatives sound really bad when these are the "complement" predicates as in (ii) while the corresponding o-causatives sound perfectly fine (i). Since the distinction is semantic, we propose to reflect it semantically and let the grammar mark (ii) (a), (b) as semantically anomalous.

Another point that needs some consideration is the question of what can cause what. Logically speaking, it must be the case that someone's doing something causes someone else to do something. Given, for instance:

171) Taroo-ga Hanako-o utaw-aseseta
    Taroo   Hanako   sing-caused
    "Taroo caused Hanako to sing."

one would normally expect from this that Taroo did something and that as a result of that Hanako sang. Though such an
event-cause-event situation is most normal, it could also be the case that Taroo's being simply something could also cause Hanako to sing. A conditioned reflex might make Hanako sing upon seeing an ugly face of Taroo; or, Hanako, being a show-off of her talented voice, might start singing anytime in the presence of a male company. Hence it appears that causation takes place in these most obvious cases between something expressible as a propositional content and some event. In case of (171) such a propositional content must all have, in a vague but intuitively clear sense, to do with Taroo; other than this, it could be almost anything, or so it seems, as for instance:

172) a. Taroo ordered Hanako to sing.
   b. Taroo implored Hanako to sing.
   c. Taroo pleaded with Hanako to sing.
   d. Taroo went into Hanako's room.
   e. Taroo looked ugly.
   f. Taroo did not wake up.
   g. Taroo smiled.
   etc.

Leaving details to future research on causation, we thus let the following meaning postulate take care of this aspect of causation. (The symbol "@" may be read "causes"; for details, see the Fragment, Chapter VII.)
This simply says that if someone stands in saseru "cause" relation to a certain proposition, then that someone's doing or being something causes p.

We propose the following translation for -saseru₁ and -saseru₂:

174) a. -saseru₁ translates as \( \lambda P \lambda x \text{saseru}'(x, P(zibun-de' (P))) \).

b. -saseru₂ translates as \( \lambda P \lambda x \text{saseru}'(x, P(P)) \).

Since ni-causative represents causation "involving a self-controllable action", we reflect this semantically by requiring modification of the predicate by a non-logical adverbial constant zibun-de' "of one's own (will)"; the exact choice of the word in fact is not very important — I have chosen the Japanese expression zibun-de "(lit.) by self" because it most closely conveys the idea we want that non-logical constant to have: recall that all the primed expressions in intensional logic are mere convenience to denote non-logical constants. We now give corresponding translations of o-causative (165a) and ni-causative (165b), based on the analysis trees of (168a) and (168b) respectively.
175) (Translation of (165a))

1. \( \text{utaw-aseru}_2 \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)
   \( (\text{utau}') \)  \( : \text{T22} \)

2. \( \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

3. \( \text{Taroo-o utaw-aseru}_2 \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

4. \( \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

5. \( \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

6. \( \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

7. \( \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

8. \( \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

9. \( \text{Hanako-ga Taroo-o utaw-aseru}_2 \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \text{T2} \)

10. \( \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

11. \( \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

12. \( \to \lambda \exists x \{ \lambda x \{ \text{saseru}'(x, \exists \exists \{ \exists \text{t} \}) \} \} \)  \( : \lambda \text{-conversion} \)

The derivation thus indicates that Hanako stands in saseru "cause" relation to the proposition that Taroo sings.

Similarly the translation for (165b) can be given mutatis mutandis; it will be equivalent to:

176) \( \text{saseru}'(h, \exists \exists \{ \exists \text{t} \}) \).
This translation shows that in case of the ni-causative, Hanako stands in saseru "cause" relation to the proposition that Taroo sings on his own will.

Causatives have certain logical properties, some of which are explicitly given in the Fragment. Note that (a) below entails (b) in each pair:

177) i. a. Taroo-ga Hanako-o odor-aseta
    Taroo    Hanako    dance-caused
    "Taroo made Hanako dance."

    b. Hanako-ga odotta
    "Hanako danced."

   ii. a. Taroo-ga Hanako-ni odor-aseta
    Taroo    Hanako    dance-caused
    "Taroo let Hanako dance."

    b. Hanako-ga odotta
    "Hanako danced."

In order to guarantee this, we introduce two meaning postulates MP7 and MP8 (though it is to be noted that in case of saseru' MP8 is superfluous because of MP6; but it will be essential in capturing entailments having to do with indirect passives as we will see in section 5 below):

178) MP7  \[\neg (P(x) \land P(x))\]
MP8 $\square[\delta(x,p) \rightarrow \neg \neg p]$, where $\delta = \text{saseru'}$ or $\text{rareru'}$.

MP7 simply guarantees that if someone does something on his own will, then he does it. The postulate is an adverbial counterpart of MP5. If we had manner adverbs in our grammar, they will presumably be all subject to this postulate. MP8 says that if someone stands in saseru "cause" (or rareru "indirect passive") relation to a certain proposition, then the proposition is true. Thus (177ia) entails (177ib) because, by MP8, line 1 below, which is a translation of (177ia), entails line 3 (disregarding the tense):

179)
1. $\text{saseru'}(t, \neg \text{odoru'}(h))$
2. $\neg \neg \text{odoru'}(h)$
3. $\text{odoru'}(h)$

Similarly, (177iia) entails (177iib), because line 1 below, which is a translation of (177iia) entails line (2), which is equivalent to line 3, which by MP7 entails line 4, which is equivalent to line 5.

180)
1. $\text{saseru'}(t, \neg \text{zibun-de'}(\neg \text{odoru'})(h))$
2. $\neg \neg \text{zibun-de'}(\neg \text{odoru'})(h)$
3. $\text{zibun-de'}(\neg \text{odoru'})(h)$
4. "odoru' \( h \)\}
5. odoru' \( h \).

The reason that (170iiia), for instance, is strange is because the following is semantically anomalous\(^{64}\):

181) (= the translation of (170iiia))

\[
\text{saseru}(t, \text{`zibun-de'}(\text{`kanasimu'})(h)).
\]

Kanasimu "grieve" is not a self-controllable action, and hence one cannot kanasimu "grieve" on one's own will.\(^{65}\)

4.2.4. Double-o constraint.

We also employ what is commonly known as double-o constraint as a surface filter to block sentences that contain two occurrences of Ts that are marked by the particle \( o \) indicating the grammatical object commanded by the same verb.\(^{66}\) Hence:

182) a. *Taroo-ga Hanako-o Ziroo-o nagur-aseru
   
   Taroo  Hanako  Ziroo  hit-cause
   
   "Taroo makes Hanako hit Ziroo."

b. Taroo-ga Hanako-ni Ziroo-o nagur-aseru\(^{67}\)
   
   "Taroo lets Hanako hit Ziroo."

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4.2.5. Reflexives and causatives.

Since our syntactic analysis of causative constructions does not have any complement sentences, the referential ambiguity involving the use of reflexive pronoun zibun (cf. section 1.1 of this chapter) as in:

183) Taroo-ga Hanako-ni zibun-no-heya-o soozis-aseru₁

i. "Taroo makes Hanako sweep her own room."
ii. "Taroo makes Hanako sweep his own room."

may not be so obvious. But our analysis predicts such ambiguity as is clear from the following analysis trees: the analysis tree (a) corresponds to reading (i) above, and (b) to reading (ii). (For a brief sketch of a genitive no, see footnote 10 to Chapter IV.)

184) a. Taroo-ga Hanako-ni zibun-no-heya-o soozis-aseru₁ :S2

Taroo Hanako-ni zibun-no-heya-o soozis-aseru₁ :S3
"Taroo"
Hanako zibun-no-heya-o soozis-aseru₁ :S22
"Hanako"
 zibun-no-heya-o soozisuru :S₁₈ - saseru₁
(continued on the next page) "cause"
The translations for each will end up being equivalent to (a), (b) respectively.

185) a. $\text{saseru}'(t, \text{^zaibun-de'}(\lambda x_1(x))(\forall y)\text{[heya']}(y) \& R(x_1, y) \leftrightarrow x = y) \& \text{soozisuru}'(x_1, x)](h)$

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Thus (a) indicates that Taroo stands in saseru "cause" relation to the proposition that Hanako has the property of sweeping one's own room by herself (or that Hanako sweeps her own room) and (b) indicates that Taroo stands in saseru relation to the proposition that Hanako sweeps his own room by herself.

4.2.6. Conjunction and causatives.

The following sentences are all predicted to be synonymous by our grammar, which accords with our intuition:

186) a. Taroo-ga Hanako-ni odot-te utaw-aseru

"Taroo lets Hanako dance and sing."

b. Taroo-ga Hanako-ni odor-ase-te Hanako-ni utaw-aseru

"Taroo lets Hanako dance-cause-and lets Hanako sing-cause."

c. Taroo-ga Hanako-ni odor-ase-te utaw-aseru

"Taroo lets Hanako dance-cause-and lets (Hanako) sing."
Their respective structures are:

187) a. 

\[
\begin{array}{c}
\text{t} \\
\text{1} & \text{2} & \text{IV} & \text{IV} \\
\text{T} & \text{T} & \text{V} & \text{V} \\
\text{Taroo ga Hanako ni odot-te utaw-aseru}
\end{array}
\]

b. 

\[
\begin{array}{c}
\text{t} \\
\text{1} & \text{IV} & \text{IV} \\
\text{T} & \text{2} & \text{V} & \text{2} & \text{V} \\
\text{T} & \text{T} & \text{Hanako ni odor-ase-te Hanako ni utaw-aseru}
\end{array}
\]

c. 

\[
\begin{array}{c}
\text{t} \\
\text{1} & \text{2} & \text{TV} & \text{TV} \\
\text{T} & \text{T} & \text{V} & \text{V} \\
\text{Taroo ga Hanako ni odor-ase-te utaw-aseru}
\end{array}
\]

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5. Passives.

5.0. Preliminaries.

Passive, along with Reflexivization, has been perhaps most instrumental in establishing the need for rule ordering in Japanese transformational syntax. Since we are working on the assumption that syntactic rules are optional and unordered, it will turn out, as will be made clear later, that we cannot adopt the standard analysis of passivization in Japanese. We have already rejected Reflexivization as a transformation that operates on a sentence to derive another formula (section 1); such a departure from the standard analysis was necessary both on semantic grounds and on syntactic grounds. Our treatment of reflexivization has obviated the necessity of an obligatory application of Reflexivization. Then in the last section we have shown that the obligatory application of Equi-NP Deletion is not indispensable, given our framework. In this section we will show that no extrinsic ordering is required between Passivization (of our version) and Reflexivization.

Japanese passive sentences may be divided into two types: direct passive and indirect passive. The direct passive most closely resembles English passives, having a corresponding active transitive sentence:
188) a. Taroo-ga Hanako-o naguru
   Taroo  Hanako  hit
   "Taroo hits Hanako."

   b. Hanako-ga Taroo-ni nagur-aru
   Hanako  Taroo-by  hit-Pass
   "Hanako is hit by Taroo."

Thus if (a) is true, then (b) is also true, and vice versa.
On the other hand, in Japanese, an intransitive sentence may
also appear in a passive construction:

189) i. a. Hanako-ga utaw-u
   Hanako  sing-Pres
   "Hanako sings."

   b. Taroo-ga Hanako-ni utaw-ar eru
   Taroo  Hanako-by  sing-Pass
   (lit.) "Taroo was sung (to) by Hanako."

ii. a. ame-ga huru
   rain  fall
   "Rain falls/It rains."

   b. Taroo-ga ame-ni hur-ar eru
   (lit.) "Taroo was fallen by rain."

Note that there are no corresponding active sentences to the
(b) sentences above. Similarly transitive sentences such as
the (a) sentences below may appear in this type of passive,
where (b) versions do not have any corresponding active sentences:

190) i. a. Taroo-ga Hanako-o naguru
    "Taroo hits Hanako."
    b. Ziroo-ga Taroo-ni Hanako-o nagur-areru
       (lit.) "Ziroo is hit Hanako by Taroo."

ii. a. Taroo-ga Hanako-o mitukeru
    "Taroo finds Hanako."
    b. Ziroo-ga Taroo-ni Hanako-o mituke-rareru
       (lit.) "Ziroo is found Hanako by Taroo."

In this type of passive, the one denoted by the subject NP is indirectly affected (hence the name indirect passive) in an adverse manner by the propositional content expressed in (a) sentences. The (b) sentences of (189), (190) may be thus more adequately glossed as:

191) a. (= (189ib)) Taroo is adversely affected by Hanako's singing.
    b. (= (189iib)) Taroo is adversely affected by its raining.
c. (= (190ib)) Ziroo is adversely affected by Taroo's hitting Hanako.
d. (= (190iib)) Ziroo is adversely affected by Taroo's finding Hanako.

What kind of "adversity" is involved much depends on context; for instance, if Ziroo was to receive a certain amount of money subject to the condition that he see to it that Taroo never finds Hanako, (190iib) may be used to describe the spot Ziroo is in when Taroo does find Hanako, or it may be used if Ziroo bet that Taroo would never find Hanako, but it turns out that Taroo does find Hanako, etc. Formal semantics therefore cannot do much in the way of specifying what kind of adversity is involved in these indirect passives; what is common to all indirect passive sentences is the fact that the individual denoted by the subject is adversely affected by some event that occurs without any direct participation of such an individual. In what follows, we will discuss indirect passives and direct passives in this order, and see how reflexivization and causatives in particular interact with these constructions.
5.1. Indirect passives.

5.1.1. A proposed rule of Indirect Passive.

Consider again sentences (189) or (190). Since in each case, the subject of the indirect passive ((b) sentences) is adversely affected by an independently occurring event expressed by (a) sentences, it appears it is most natural to regard an indirect passive as semantically representing a relation between an individual and a proposition. Since the indirect passive verbal suffix is -raru (or -rare-Pres), we let raru' be such a relation. Syntactically we can regard -raru to be of category IV/t, that is, it combines with a sentence to derive an expression of category IV. That is, it forms the property expressed by (b) below from (a):

192) i. a. ame-ga huru
    rain    fall
 "Rain falls."

    b. ame-ni huru-areru
    rain-by fall-Pass
    (lit.) "be fallen by rain"

ii. a. Taroo-ga Hanako-o naguru
    Taroo    Hanako    hit
 "Taroo hits Haanko."
b. Taroo-ni Hanako-o nagur-areru

Taroo-by Hanako hit-Pass

(lit.) "be hit Hanako by Taroo"

Since (b) in each pair is an ordinary IV phrase, it may be combined by S2 with a T to form a sentence (cf. (189iib) and (190iib)). We propose then the following lexicon, syntactic rule and their translations:

193) $B_{IB/t} = \{-\text{rare-Pres}\}$

-\text{rare-Pres} (or \text{-rareu}) translates as \text{rareu}'.

S23. (Indirect Passive)

If $\alpha \in P_{IV/t}, \phi \in P_t$, and $\phi$ is a verbal sentence\(^{72}\) whose main verb has a present tense, then $F_{21}(\alpha, \phi) \in P_{IV}$, where $F_{21}(\alpha, \phi) = [\psi']_{IV}$, where $\psi'$ is the result of replacing i) $[[\beta]_T \ni]$ in $\psi$ by $[[\beta]_T \ni\hat{t}]$, and ii) the main verb tense -Pres in $\psi$ by $\alpha$, where $[\psi]_t = \phi$.

T23. If $\alpha \in P_{IV/t}, \phi \in P_t$, and $\alpha, \phi$ translate as $\alpha', \phi'$ respectively, then $F_{21}(\alpha, \phi)$ translates as $\alpha'(''\phi'').$

(190iib) may be generated in the following fashion, with the corresponding assignment of translations.
Translation:

1. \( \text{Hanako-o mitukeru} \Rightarrow \text{mitukeru}'(\ ^\lambda P^\uparrow P(h)):T3 \)
2. \( \text{Taroo-(ga) Hanako-o mitukeru} \Rightarrow \lambda QQ(t)('\text{mitukeru}'(\ ^\lambda P^\uparrow P(h))):T2 \)
3. (several steps omitted) \( \Rightarrow \)

   \( \text{mitukeru}'_\times(t,h): MP3 \)
4. \( \text{Taroo-ni Hanako-o mituke-rareru} \Rightarrow \text{rareru}'(\ ^\lambda \text{mitukeru}'_\times(t,h)): T23 \)
5. \( \text{Ziroo-ga Taroo-ni Hanako-o mituke-rareru} \Rightarrow \lambda PP(z)('\text{rareru}'(\ ^\lambda \text{mitukeru}'_\times(t,h))): T2 \)
6. \( \Rightarrow \text{rareru}'(\ ^\lambda \text{mitukeru}'_\times(t,h))(z): \text{(two steps)} \)
7. \( \Rightarrow \text{rareru}'(z, '\text{mitukeru}'(t,h)): \text{Relation Notation} \)

Thus the derivation ends up with Ziroo standing in \text{rareru} "indirect passive" relation to the proposition that Taroo
finds Hanako. The entailment from (190iib) to (190iia) is guaranteed by MP8; the line 7 above thus entails the following:

195) \( \neg \text{mitukeru}^* (t, h) \rightarrow \text{mitukeru}^* (t, h) \)

That is to say, if Ziroo is adversely affected by Taroo's finding Hanako, then it follows that Taroo finds Hanako. The top line of the analysis tree (194) is equivalent to the following structure:

196)

```
\( t \)
```

```
\( 1 \) \( \hat{i} \) \( 2 \) \( v \)
```

```
\( T \) \( T \) \( T \)
```

```
Ziroo ga Taroo ni Hanako o mituke-rareru
```

"Ziroo" "Taroo" "by" "Hanako" "find-ind. Pass"

5.1.2. **Indirect passive and reflexivization.**

Indirect passives do not present much of a problem to
reflexivization since, as may be easily guessed at, this does not create any new subject like direct passives; hence Reflexivization, which in effect is a statement of dependency of reference between subject and non-subject, should not be affected in any significant way if indirect passives are formulated the way we do (or as in the standard literature where -rareru takes a complement). A sentence like the following is ambiguous as to the reference of zibun; it could be either Taroo or Hanako.

197) Taroo-ga Hanako-ni zibun-o sonkeis-areru

Taroo Hanako-by self respect-IndPass

(lit.) "Taroo is respected self by Hanako."

i. "Taroo is adversely affected by Hanako's respecting him."

ii. "Taroo is adversely affected by Hanako's respecting herself."

The analysis trees for these readings are (a), (b) below respectively:

198) a. Taroo-ga Hanako-ni zibun-o sonkeis-areru :S9

Taroo-PRO\textsubscript{1} ga Hanako-ni zibun-o sonkeis-areru "S2

"Taroo"

PRO\textsubscript{1} Hanako-ni PRO\textsubscript{1} - o sonkeis-areru :S23

"PRO\textsubscript{1}"

(continued on the next page)
The translations for these will come out as being equivalent to (a) and (b) below respectively:

199) a. \textit{rareru}'(t, ^{\text{sonkeisuru}}_{(h,t)})

b. \textit{rareru}'(t, ^{\text{sonkeisuru}}_{(h,h)}).
Thus, by virtue of MP8, (a) entails (a) below, and (b), (b) below:

200) a. sonkeisuru'h,t)

    b. sonkeisuru'h,h).

5.1.3. **Indirect passive and causative construction.**

Syntactically at least, since S23 (Indirect Passive) generates an expression of category IV, such an expression may feed into S22 (Causative); similarly, a sentence in causative construction may feed into S23 since this takes as an argument a formula. Thus, in principle, we should get both causative of an indirect passive and an indirect passive of a causative sentence. Let us see below some of these sentence types.

5.1.3.1. **Causative of indirect passive.**

Consider for instance a sentence like the following (though we do not have any semantics (and in fact syntax either) for mass, we pretend that we do):

201) ame-ga huru

    rain fall
"Rain falls/It rains."

From this S23 (Indirect Passive) may form an expression of category IV:

202) ame-ni hur-areru
   rain-by fall-IndPass
   (lit.) "be fallen by rain"

From this S22 (Causative) may generate expressions of category TV like:

203) a. ame-ni hur-are-sasu₁
    rain-by fall-IndPass-cause
    (lit.) "cause to be fallen by rain"

b. ame-ni hur-are-sasu₂
    rain-by fall-IndPass-cause
    (lit.) "cause to be fallen by rain"

Then (a), (b) may combine with a T via S3 to form ni-causative and o-causative, respectively:

204) a. Hanako-ni ame-ni hur-are-sasu₁
    Hanako    rain-by fall-IndPass-cause
    (lit.) "cause Hanako to be fallen by rain"
b. *Hanako-o ame-ni hur-are-saseru₂

Hanako rain-by fall-IndPass-cause
(lit.) "cause Hanako to be fallen by rain"

Finally a T may combine with these via S2 to form sentences:

205) a. *Taroo-ga Hanako-ni ame-ni hur-are-saseru₁

Taroo Hanako rain-by fall-IndPass-cause
(lit.) "Taroo causes Hanako to be fallen by rain."
"Taroo brings it about that Hanako gets adversely
affected by her own will by its raining."

b. Taroo-ga Hanako-o ame-ni hur-are-saseru₂

Taroo Hanako rain-by fall-IndPass-cause
(lit.) "Taroo causes Hanako to be fallen by rain."
"Taroo brings it about that Hanako is adversely
affected by its raining."

Using p to denote the proposition that it is raining, (a) and
(b) above are equivalent to (a) and (b) below:

206) a. saseru'((t, ^zibun-de'(rareru'(p))(h))

b. saseru'((t, rareru'(p))(h)).

What (a) amounts to is that Taroo stands in saseru "cause"
relation to Hanako's getting herself adversely affected by
its raining on her own will; thus (a) says, contrary to our
normal assumption, that to be adversely affected by its raining is a self-controllable predicate. This is what makes (205a) sound very strange or incomprehensible. On the other hand, (b) simply says that Taroo stands in saseru "cause" relation to Hanako's being adversely affected by its raining, a situation that may quite normally occur; suppose, for instance, that Taroo, out to take spite on Hanako, tells her her new boy-friend is waiting for her at three o'clock at Nakanoshima Kooen (Nakanoshima Park) in Osaka, and suppose further that Taroo knows that it is going to rain around three o'clock in Osaka and that Hanako, being fragile, easily catches pneumonia if caught in the rain: under this circumstance, (205b) may be used to describe Taroo's triumphant success in bringing it about that Hanako is actually caught in the rain. In general, then, the ni-causative of an indirect passive, even if syntactically well-formed, should sound semantically strange because this construction commits us, counter to our general assumption, to the position that the property of being adversely affected by some event is self-controllable; other things being equal, the o-causative of an indirect passive should be perfectly acceptable. This distinction appears most clear in a pair like (205) though a sentence like the following, probably because of multiple occurrences of NPs of a variety of functions, seems to cause some processing difficulty, though I believe it is understandable with paper and pencil:
207) Taroo-ga Hanako-o Saburoo-ni Yosiko-ni kisus-are-saseru

Taroo     Hanako     Saburoo-by Yosiko-to kiss-IndPass-cause

(lit.) "Taroo causes Hanako to be kissed Yosiko by Saburoo."

A sentence like the following, even if acceptable semantically, is marked ungrammatical by the double-o constraint (4.2.3).

208) Taroo-ga Hanako-o Saburoo-ni Yosiko-o mituke-rare-saseru

Taroo     Hanako     Saburoo-by Yosiko find-IndPass-cause

(lit.) "Taroo causes Hanako to be found Yosiko by Saburoo."

5.1.3.2. **Indirect passive of causative.**

So far as I know, both syntactically and semantically the indirect passive of causative sentences is straightforward and presents no problem.

209) i. a. Hanako-ga yasai-o kusar-aseru

Hanako     vegetable rot-cause

"Hanako causes vegetable to rot."

b. Taroo-ga Hanako-ni yasai-o kusar-ase-rareru

Taroo     Hanako-by vegetable rot-cause-IndPass

"Taroo is adversely affected by Hanako's causing vegetable to rot."

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ii. a. minna-ga Hanako-ni utaw-aseru
    everyone Hanako sing-cause
    "Everyone causes Hanako to sing (by herself)."

b. Taroo-ga minna-ni Hanako-ni utaw-ase-rareru
    Taroo everyone-by Hanako sing-cause-IndPass
    "Taroo is adversely affected by everyone's causing
    Hanako to sing (by herself)."

(209ib) is an indirect passive of the o-causative (209ia),
and (209iib) is an indirect passive of the ni-causative
(209iia).

5.2. Direct passives.


Where a transformational approach is concerned, except
for Howard and Niyekawa-Howard (1976), which posits a uni-
form deep structure for both direct and indirect passives74,
it is, I believe, fair to say that direct passives (b) are
considered to be transformationally derived from the corres-
ponding actives (a) in the standard literature.

210) i. a. Taroo-ga Hanako-o naguru
    Taroo Hanako hit
    - 343 -
"Taroo hits Hanako."

b. **Hanako-ga Taroo-ni nagur-areru**

Hanako Taroo-by hit-Pass

"Hanako is hit by Taroo."

ii. a. **Hanako-ga Taroo-o keru**

Hanako Taroo kick

"Hanako kicks Taroo."

b. **Taroo-ga Hanako-ni ker-areru**

Taroo Hanako-by kick-Pass

"Taroo is kicked by Hanako."

The derivation is more or less straightforward, and it must be admitted that this approach has a certain air of elegance, being able to explain in a very simple and natural way why direct passives and their corresponding actives are synonymous, a basic mystery that on second thought proves more puzzling than obvious. But as will be made clear later, we cannot accept this kind of approach to direct passives (nor Howard and Miyekawa-Howard's approach, as was pointed out in footnote 74 above) because of our assumption that rules are unordered and optional and that every expression of any syntactic category is well-formed. We thus present below our analysis of direct passives that is in consonance with these assumptions of ours.
5.2.2. A proposed rule of Direct Passive.

Since (direct) Passivization in the standard treatment is a governed rule, we follow Bennett (1975: Chapter 6) and Dowty (1978c) in regarding Passivization as a kind of lexical rule. Specifically I follow Dowty's treatment of Passivization as a category changing rule from an expression of TV to an expression of IV. We can then regard the agentive ni "by" in the direct passive as of category Ɂ/T (where Ɂ = df. IV/(IV/T), i.e., IV/TV) and form a direct passive like (210ib) in the following fashion:

211)  
\[
\begin{array}{c}
\text{Hanako-ga Taroo-ni nagur-areru} \\
\text{Hanako} \\
\text{"Hanako"} \\
\text{Taroo-ni} \quad \text{(Agentive)} \\
\text{"Taroo"} \\
\text{ni} \quad \text{"by"} \\
\text{"Taroo"} \\
\text{naguru} \quad \text{"hit"} \\
\text{Taroo-ni} \\
\text{"Taroo"} \\
\text{ni} \quad \text{"by"} \\
\end{array}
\]

Our rule of Direct Passivization, together with related expressions and translations, is as follows:

212) \( B_{Ɂ/T} = \{ \text{ni, nivotte} \} \)

"("by", "by")"
ni, niyotte both translate as \( \lambda x \lambda \bar{x} \lambda y \bar{y} (\bar{y} \lambda y (x, \bar{y} \lambda x \bar{x} P(x))) \), where \( \bar{y} \) is \( v_0, s, f(TV) \).

S24. (Agentive \( \text{ni} \))

If \( \alpha \in P_T, \beta \in B_{\bar{T}} \), then \( F_{22}(\alpha, \beta) \in P_{\bar{T}}, \) where
\[ F_{22}(\alpha, \beta) = [\alpha \beta]_{\bar{T}}. \]

T24. If \( \alpha \in P_T, \beta \in B_{\bar{T}}, \) and \( \alpha, \beta \) translate as \( \alpha', \beta' \) respectively, then \( F_{22}(\alpha, \beta) \) translates as \( \beta'(\alpha'). \)

S25. (Direct Passive)

If \( \alpha \in P_{\bar{T}}, \beta \in P_{TV}, \) and \( \beta \) has the form \( [\gamma]_{TV} \), then
\[ F_{23}(\alpha, \beta) \in P_{IV}, \] where \( F_{23}(\alpha, \beta) = [\alpha \beta']_{IV}, \) where \( \beta' \) is the result of replacing the main verb tense \( \text{Pres} \) of \( \gamma \) by \( \text{rare-Pres}. \)

T25. If \( \alpha \in P_{\bar{T}}, \beta \in P_{TV}, \) and \( \alpha, \beta \) translate as \( \alpha', \beta' \) respectively, then \( F_{23}(\alpha, \beta) \) translates as \( \alpha'(\beta'). \)

The corresponding translation for (211) can be shown roughly as follows:

213)

1. Taroo-ni \( \implies \) \( \lambda x \lambda \bar{x} \lambda y \bar{y} (\bar{y} \lambda y (x, \bar{y} \lambda x \bar{x} P(x))) \)
\[ (\bar{y} \lambda Q \bar{Q}(t)) \] :T24

2. \( \implies \) \( \lambda x \lambda Q \bar{Q}(t) (\bar{y} \lambda y (x, \bar{y} \lambda x \bar{x} P(x))) \) :\( \lambda \)-conversion

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Thus the derivation shows that the top line of (211) (or (210ib)) is semantically equivalent to the proposition that Taroo hits Hanako (i.e., (210ia)). Hence the direct passive is synonymous to the corresponding active. But note that in our treatment a pair of sentences like the following are not necessarily synonymous:
214) a. Taroo-ga kappa-o sagasu
   "Taroo seeks a kappa."

   b. kappa-ga Taroo-ni sagas-areru
   "A kappa is sought by Taroo."

This is so because our treatment always guarantees the extensionality of the subject. Thus, while (a) is ambiguous between intensional and extensional reading as to the object kappa, (b) only has the extensional reading in our treatment. Our intuition on this matter seems a little bit shaky, but it seems to me that (b) does always commit us to the existence of a kappa.  

In addition to a regular direct passive like (a), we have a truncated version (b).

215) a. Hanako-ga Taroo-ni nagur-areru
   "Hanako is hit by Taroo."

   b. Hanako-ga nagur-areru
   "Hanako is hit."

Since (b), without any contextual clarification, is vague as to who or what hits Hanako, we regard this to be derived from:
216) Hanako-ga PRO₁-ni nagur-areru
    "Hanako is hit by PRO₁."

by a deletion transformation of the following sort:

217) SS10. (Agent Deletion)

\[ X, \text{PRO}₁ \ni, Y \]
\[ 1, 2, 3 \rightarrow 1, \emptyset, 3 \]

where PRO₁ ni = İ

TT10. If \( \phi \in \mathcal{P}_t \) and translates as \( \phi' \), then the result of applying SS10 to \( \phi \) translates as \( (\exists x_1)\phi' \).

Thus we regard (215b) as semantically equivalent to:

218) \( (\exists x_1)\text{naguru}',(x₁,h) \).

That is, someone or something hits Hanako.

5.2.3. Direct passive and reflexivization.

I first outline why, in the standard treatment, Passivization has to be ordered before Reflexivization. Unlike the case of indirect passives, a sentence like the
following does not show referential ambiguity as to the reference of zibun (cf. the example (197)):

219) Taroo-ga Hanako-ni zibun-no-heya-de nagur-areru

Taroo Hanako-by self-'s-room-in hit-Pass

(lit.) "Taroo is hit by Hanako in self's room."

i. "Taroo is hit by Hanako in his own room."

ii. "Taroo is hit by Hanako in her own room."

But if, in the standard treatment of passives, Passivization did not precede Reflexivization, the reading (ii) will also be predicted to be a possible reading since (219)' could be generated, given such relaxation of ordering, in the following manner, too.

220) Hanako-ga Taroo-o Hanako-no-heya-de naguru

↓ Reflexivization

Hanako-ga Taroo-o zibun-no-heya-de naguru

↓ Passivization

Taroo-ga Hanako-ni zibun-no-heya-de nagur-areru

In order to block such an undesirable derivation, Passivization must be ordered before the application of Reflexivization in the standard treatment.78

It appears that such a rule ordering is a necessary
consequence of formulating a rule of Direct Passivization as an operation on a sentence to form another sentence because such an operation necessarily has to create a new subject. Since (forward) reflexivization is a referential dependency between subject and non-subject, in the absence of any rule ordering, such dependency should obtain whenever and wherever there is a subject; thus the subject before and after the application of Passivization is a potential antecedent of reflexive pronoun zibun. Since our rule of Direct Passive S25 forms an IV from a TV, nowhere is there a syntactic process whereby an "old" subject is replaced by a "new" subject. Since, furthermore, our rule of Reflexivization is actually part of a sentence formation from T and IV (S2), it follows that, in our approach, there is an intrinsic ordering of Reflexivization after Direct Passive. Thus a sentence like (219) has only one type of derivation where the reference of zibun is concerned, and the reading predicted by such a derivation is (219i). A partial analysis tree for (219), assuming a rule for adverbial formation (S26) may look something like this:

221) Taroo-ga Hanako-ni zibun-no-heya-de nagur-areru :SS5

   Taroo-ga zibun-no-heya-de Hanako-ni nagur-areru :S9

   "Taroo" PRO₂-ga zibun-no-heya-de Hanako-ni nagur-areru :S2

   (continued on the next page)
5.2.4. **Direct passive and intentional adverb.**

A pair of active and passive sentences involving the use of intentional adverbs like *wazato* "on purpose" are in general not synonymous:

222) a. **Hanako-ga wazato Taroo-o naguru**

   *Hanako on purpose Taroo hit*

   "Hanako hits Taroo on purpose."

b. **Taroo-ga wazato Hanako-ni nagur-areru**

   *Taroo on purpose Hanako-by hit-Pass*

   "Taroo is hit by Hanako on purpose."

While a standard treatment meets certain difficulties in explaining this fact, our treatment predicts that this is
necessarily the case, given that wazato "on purpose" is an IV-taking expression to form another IV (i.e., IV/IV). The translations for these sentences will come out as being equivalent to (a), (b) below respectively.

223) a. wazato'(\^\naguru'(\^\lambda\P\P(t))(h)
   b. wazato'(\^\lambda\x\naguru'(h,\^\lambda\P\P(x))(t).

Thus (a) says that Hanako has the property of intentionally hitting Taroo, while (b) says Taroo has the property of intentionally getting hit by Hanako.

3.2.5. Direct passive and causative construction.

Since S22 (Causative) forms an expression of category TV from an expression of category IV, the result may feed into S25 (Direct Passive), resulting in a direct passive of a causative; similarly, the output of S25, being of category IV, may feed into S22, becoming a causative of a direct passive. Let us below see some of these constructions.

5.2.5.1. Causative of direct passive.

The passive phrase like:
224) Hanako-ni nagur-areru
   Hanako-by hit-Pass
   "be hit by Hanako"

forms part of the basis for the following ni-/o-causative sentences:

225) a. (ni-causative)
    Taroo-ga Saburoo-ni Hanako-ni nagur-are-saseru
    TAROO Saburoo Hanako-by hit-Pass-cause
    (lit.) "Taroo causes Saburoo to be hit by Hanako."

b. (o-causative)
    Taroo-ga Saburoo-o Hanako-ni nagur-are-saseru
    TAROO Saburoo Hanako-by hit-Pass-cause
    (lit.) "Taroo causes Saburoo to be hit by Hanako."

The translations for each come out as being equivalent to:

226) a. saseru'(t,^zibun-de'(^\lambda xnxaguru'(h,^\lambda P'P(x))))(s)

b. saseru'(t,^\lambda xnxaguru'(h,^\lambda P'P(x))(s)).

Thus, (a) says Taroo stands in saseru "cause" relation to the proposition that Saburoo on his own (zibun-de') gets himself hit by Hanako; (b), on the other hand, simply says that Taroo brings it about that Saburoo gets hit by Hanako. The former is appropriate in a situation, for instance, where
Saburoo knows how to make Hanako angry and have her hit him, and Taroo orders Saburoo to bring it about; the latter, on the other hand, is appropriate in a situation, for instance, where Taroo asks Hanako to hit Saburoo, and she hits Saburoo. Thus, the basic distinction of controllability of the predicate involved in ni- and o-causative also crop up in the causative of passive. As we have seen in the immediately preceding section, this is exactly what we expect, given our treatment of passive and IV-taking adverbs like zibun-de "(lit.) by self".

5.2.5.2. Direct passive of causative.

An output of S22 (Causative) like the following:

227) odor-aseru
dance-cause
"cause to dance"

is partly responsible for a direct passive of causative like:

228) Hanako-ga Taroo-ni odor-ase-rareru
Hanako Taroo-by dance-cause-Pass
"Hanako is made to dance by Taroo."

There is thus a syntactic merger between the ni-causative and
the o-causative in direct passives. Is this then ambiguous? Our grammar predicts that this must be ambiguous between the ni-causative reading and the o-causative reading. Since the latter covers a broader case of causation, there is no direct way of verifying the two readings; wherever the ni-causative is possible, the corresponding o-causative is possible. We can only show that a construction favored exclusively by the o-causative passivizes (but cf. footnote 62), and that the result is grammatical.

229) **Hanako-ga Taroo-ni kanasim-ase-rareru**

_Hanako_ Taroo-by grieve-cause-Pass

"Hanako is caused to grieve (over something) by Taroo."

Recall that the ni-causative sounds strange or odd if formed on a non-self-controllable predicate like kanasimu "grieve (over something)" (cf. (170)). That (229) sounds perfectly normal thus shows that it is a passive of an o-causative sentence.

5.2.6. Passive of di-transitives.

A di-transitive like syookaisuru "introduce" forms two kinds of passive sentences; one in which the original direct object becomes the passive subject, and the one in which the
original indirect object becomes the passive subject.

300) a. Taroo-ga Hanako-o Ziroo-ni syookaisuru
   Taroo Hanako Ziroo introduce
   Taroo introduces Hanako to Ziroo."

   b. Hanako-ga Taroo-niyotte Ziroo-ni syookais-areru
   Hanako Taroo-by Ziroo introduce-Pass
   "Hanako is introduced to Ziroo by Taroo."

   c. Ziroo-ga Taroo-ni Hanako-o syookais-areru
   Ziroo Taroo-by Hanako introduce-Pass
   "Ziroo is introduced Hanako by Taroo."

The generation of (b) is straightforward; the agentive phrase
Taroo-niyotte "by Taroo" combines with a transitive verb
phrase Ziroo-ni syookaisuru "introduce to Ziroo" and forms a
passive IV phrase Taroo-niyotte Ziroo-ni syookais-areru "be
introduced to Ziroo by Taroo". But there is no way, as it
stands, our rules can generate (c); this is because the se-
quence Hanako-o syookaisuru "introduce Hanako" does not
constitute a TV expression. We thus seem to need a rule to
form such an expression with a concomitant revision of the
passive formation (S25), which is accommodated in the
final statement of this rule in the Fragment (cf. S25 and
S28).
6. **Summary.**

This chapter has been an examination of some basic and representative syntactic constructions of Japanese. Our proposed syntactic analyses have differed from the standard transformational analyses in a number of respects. Most specifically and perhaps most importantly, we have shown that grammatical analyses can be presented without rule ordering and rule obligatoriness. Section 1 was an examination of reflexivization. Since (forward) Reflexivization in Japanese is a statement of referential dependency between a subject and a non-subject, we proposed that this be stated as part of sentence formation from Ts and IVs. Several ramifications of the proposal were also examined. Then in section 2 we turned to conjunction. We rejected the standard Conjunction Reduction approach, based on the interactions of quantifiers and intensional contexts. We also proposed that quantification be limited to sentential-level quantification (or t-quantification). Negation was the topic of section 3, where we examined the problem of scopes of negation with respect to conjunctions and quantifiers. Section 4 was devoted to an examination of equi-NP constructions. Since an obligatory application of the standard Equi-NP Deletion posits a structure that is not well-formed from the viewpoint of surface syntax, we rejected the standard analysis and proposed an alternative syntax and semantics, which was free
of an obligatory Equi-NP Deletion and the so-called like-subject constraint. Then in the final section, we took up passive constructions. We accepted the basic distinction between direct and indirect passives, and proposed different syntax and semantics for these. Then we showed that the very basic argument for rule ordering in Japanese involving Passivization and Reflexivization did not hold for our grammar any longer, thereby confirming our position that syntactic rules are all optional and unordered.
Footnotes to Chapter V

1 Strictly speaking, this is not accurate. In the formal style, zibun may be used instead of the first person pronoun watasi "I". Also, in some dialects, notably in Kansai area, including my own idiolect, zibun is very often used as a second person pronoun in a conversation; the use of zibun in such a case signals peerhood of speaker and hearer.

2 In addition to (3), there is also what may be called Backward Reflexivization, in which a nonsubject in the main clause serves to reflexivize another NP in the subordinate clause. Very often the predicate of the main clause in such a case expresses a human emotion. Although I believe the phenomenon of backward reflexivization can be treated in our framework, too, I will focus my discussion here on forward reflexivization. For some details and points of interest, see the references given below in footnote 3.

3 (3) is based on Hasegawa (1980: 3), which in its turn is based on works like Kuno (1973), Oyakawa (1973, 1974), N. McCawley (1976), Inoue (1976a, 1976b). Kuno and Kaburaki (1975) is important in that it first pointed out the relevance of nonsyntactic factors (like "empathy" or "speaker's viewpoint") to reflexivization; but I regret to say that I have to disregard their functional approach to syntax in this
dissertation simply because I cannot imagine at this writing how such notions like "empathy" or "viewpoint" are to be formally incorporated into the overall framework.

*Cf. footnote 2 above. Though not widely discussed, a sentence like the following may well turn out to be a counterexample to this generalization. (I am grateful to John Haig for the following example.)*

i) sensei-ga seito-tati-ni zibun-no-seki-no bangoo-o
   teacher pupil-plural self-'s-seat-of number

osieta
told
(lit.) "The teacher told (his) pupils the number of self's seat."
   a) "The teacher told his pupils his seat number."
   b) "The teacher told his pupils their seat numbers."

In this example, it appears *zibun* could refer to either *sensei*, a subject, or *seito-tati*, an object. Where this kind of example leads to with respect to the formulation of (forward) Reflexivization is not clear at present. And we must simply ignore an example like (i) with reading (b) in the discussion below. (John Haig credits examples like (i) originally to a Yuriko Hațori (personal communication).)
That is, if one maintains a flat structure (cf. section 3.1, Chapter II), a direct object is always a t-daughter. With a hierarchical structure, the condition of t-daughterhood must accordingly be changed; Hasegawa (1980: 3), for instance, has the following characterization: "1 and 3 do not have to be clause mates, but when 1 and 3 are clause mates and 3 is not dominated by another NP, RFLX (= Reflexivization /TS) is obligatory."

In other words, (14) and (15a) are ok if the subject and the object are not referentially bound with each other.

But the distinction in usage between zibun and zibuntati "(lit.) self and others" as remarked here is not completely accurate. It appears to me that the following has two readings:

i) Taroo to Hanako-wa zibuntati-no heya-ni iru
   Taroo and Hanako selves-'s room-in are
   a. "Taroo and Hanako are in their own room."
   b. "Taroo and Hanako are each in his/her own room."

The first reading is a case of joint possession; the second a case of individual possession. So sometimes zibuntati "selves" does indicate individual-level reflexivity; I simply do not know when or how such usage may crop up. Compared
with zibuntati "selves", zibun "self" always indicates individual-level reflexivity, and the following has only the second reading above.

ii) Taroo to Hanako-wa zibun-no heya-ni iru.

8 Hasegawa (1980: footnote 3, p.18) simply ignores this possibility of rule ordering and rejects any ordering solution for a sentence like (21a); she appears to consider both Q-float and Reflexivization cyclic, an assumption not necessarily true or plausible.

9 Hasegawa (1980: 9) notes a very interesting sentence, saying "in a certain construction, an NP from which a quantifier moves out can undergo RFLX." Her example is:

i) (= Hasegawa's (12))

Shoonentachi-ga monbushoo -ni zibuntachi-o
boys SM Mini. of Educ. IO selves OM

sannin amerika-e haken su-ru yooni yoosei shi-ta
three America to send-pres. Comp. request-past
'(lit.) The boys requested the Ministry of Education to send selves three (three of them) to the U.S.A.'

Of course "in a certain construction" is the key to this
kind of sentences, in which Q's do seem to have floated from an NP that later gets reflexivized. I do not know what is going on here; one thing that is clear about (i) is that this necessarily involves a group-level reflexivity, and the sentence is equivalent to the following English gloss:

ii) "The (three) boys together as a group requested the Ministry of Education to send the three of them to the U.S.A."

Note that replacement of zibuntati by zibun "self" in (i) results in an ungrammatical sentence. (I will continue to use Hasegawa's Romanization of Japanese here.)

iii) *Shoonentachi-ga monbushoo-ni zibun-o sannin amerika-e haken su-ru yooni yoosei shi-ta

In order to express the individual-level reading, one would have to say:

iv) sannin-no shoonen(tachi)-ga monbushoo-ni zibun-o three boy(s) Mini. of Educ. self

amerika-e haken su-ru yooni yoosei shi-ta

U.S.A.-to send-pres. Comp. request-past
"Three boys requested the Ministry of Education to send them (lit. self) to the U.S.A."

Thus the sequence zibun-o sannin is simply impossible (iii). As for (i), I have to content myself by simply noting that group-level reflexivity and the plural reflexive zibuntati "selves" are both in need of further careful studies; no brute-force syntactic reflexivization that covers both individual and group-level reflexivizations seems to be capable of offering us any light on these issues.

10 See Sugimoto (1977) for an examination of RCC.

11 It is to be noted that (24) and (25) make different predictions when zibun's do not command each other. (25) is stronger in that it applies to a narrower range of cases. Both versions, I believe, are inadequate as they stand. For an examination of (24), see Sugimoto (1977), where some apparent/real counterexamples are presented, together with the indication of possible modifications one might make in revising (24).

12 In addition to these, (28b) will also mean, depending on the context of use, "Hanako talks with Bo/Catherine/ ..., etc." unless the variables are sorted according to human males and females (and of course nonhumans). Thus, at least where
a deictic use of a pronoun is concerned, sorted intensional logic seems mandatory. For considerations for treating gender phenomena in English based on sorted variables (according to male, female, neutral genders), see Cooper (1975). Although the point is reiterated later in Chapter VI, to the extent that sentences like (28b) could mean "Hanako talks with Bo/Catherine/..., etc.", our grammar is defective. But I believe this is of no theoretical significance now that we have a work like Cooper (1975), which, if necessary, can be incorporated into our framework.

I say "least controversial" because I see some other possibilities. For instance, instead of (32c), one may say:

i) ... dareka dansei-to sono dansei-nituite ...
   ... some man-with the man-about ...
   "... with some man about the man ..."

Or, (32f) may be alternatively said as:

ii) ... sannin-no dansei-to sorezore-nituite ...
   ... three man-with each-about ...
   "... with three men about each ..."

But these alternatives all seem to have, in the place of a pronoun, a "pure" lexical item or derived expression refer-
entially unbound with any other expression, and hence better not be treated as part of quantification.

14 Perhaps the form kanozyotati "she's or she and others" is more widely accepted by more people than kanozyora, but I will use the latter in our grammar for no other reason than to maintain the morphological parallelism of singular-plural pair: kare-karera "he-he's" and kanozyo-kanozyora "she-she's".

15 Since karera and kanozyora mean something like "he and others" and "she and others" respectively, the choice of these forms in referring to a sexually mixed group of people or as a bound form of a (plural) quantified expression is controlled by two factors: 1) if someone stands out in a group and that someone is male (or female), then the pronoun to be used is karera "he and others" (or kanozyora "she and others"), and 2) if none stands out in a group, the form karera is to be used to refer to a mixed group. Needless to say, where only male (or female) people are involved, the form is karera (or kanozyora). This aspect of pronoun choice is not reflected in the grammar; we simply use karera "he and others" where a group of opposite sexes are involved.

16 By an auxiliary notion "γ is a feature specification of α", we understand something of the following sort.
Let any lexical item $A \in B_a$ be represented by the general form:

$$\begin{bmatrix}
\alpha_n \\
X_n
\end{bmatrix}_a.$$

In the case of Taroo, $\alpha_n = \text{Taroo}$, $X_n = [+\text{human}, +\text{male}, -\text{plural}]$, and $a = T$.

$\gamma$ is a feature specification of $\alpha$ iff $\gamma = f(\alpha)$ ($\alpha \in P_T$), where $f$ is a mapping of the following sort.

1) if $\alpha$ is not a conjunction, then

$$f(\alpha) = X_n \text{ if } \alpha = \begin{bmatrix} \alpha_n \\ X_n \end{bmatrix}_T \text{, and}$$

$$f(\alpha) = \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} \text{ if } \alpha = \begin{bmatrix} \alpha_1 \\ X_1 \end{bmatrix}_Q \gamma \begin{bmatrix} \alpha_2 \\ X_2 \end{bmatrix}_{CN}_T.$$

2) if $\alpha$ is a conjunction of $\alpha_1$ and $\alpha_2$, then

$$f(\alpha) = \begin{bmatrix} f(\alpha_1) \\ f(\alpha_2) \end{bmatrix}.$$

With respect to S9, $f$ here simply has the effect of copying out relevant lexical features for the determination of actual pronominal forms. Cf. (36) below.
The argument for disjunction parallels that for conjunction. Cf. section 2.6 below and footnote 35.

The basic morphophonemic alternation, taking "-" as a morpheme boundary, is:

i) a. $C_1$, $-C_2$
   
   $1, 2 \Rightarrow 1, \emptyset$

   b. $V_1$, $-V_2$
   
   $1, 2 \Rightarrow 1, \emptyset$.

Thus the present tense morpheme for verbs $-ru$, when substituted for Pres, yields forms like:

ii) odor-ru $\Rightarrow$ odoru "dance"
   kak-ru $\Rightarrow$ kaku "write"
   oyog-ru $\Rightarrow$ oyogu "swim".

On the other hand, the verbal conjunction form -i introduced below yields forms like:

iii) nige-i $\Rightarrow$ nige "flee-and"
    mi-i $\Rightarrow$ mi "look-and".

Though this is a fairly general process in Japanese, exceptions do exist — particularly when $C_2$ above is t. This
includes the past tense morpheme -ta, another verbal con-
junction form -te, etc. In these cases, assimilation accounts
for most of the forms though some are highly irregular from a
synchronic point of view. Some of the representative past
forms show the following alternations:

iv) odor-ta = odotta "danced"
kaw-ta = katta "bought"
tob-ta = tonda "flew"
yom-ta = yonda "read"
sin-ta = sinda "died"
kak-ta = kaita "wrote"
oyog-ta = odoida "swim"

The vowel stem verbs are completely regular in the past tense.

v) nige-ta = nigeta "fled"
mi-ta = mita "saw".

19 Other conjunctive particles like ga, keredo "but" are
not considered here. These are also truth-functional, but
their usage differs significantly in that notions like speak-
er's expectation comes into play for a proper use of these
particles. The three forms (40) (c), (d), (e) are in this
respect what may be called (comparatively) "colorless" con-
junctions.
Kuno (1973: Chapter 17) calls the -te form of a verb "gerundive", and the -i form of a verb "continuative". He further notes that -te/-i conjunction sometimes is better regarded as subordination when the subject of the right conjunct in a (sentential) coordination is missing under identity with that of the left conjunct. He gives several pieces of evidence that show structural ambiguity of -te/-i conjunction as between coordinate and subordinate structures. But it is important to note that such ambiguity arises only when the conjunction is understood to mean, not simply "and", but rather "and then", or to use Kuno's words "time sequences" (p.201). Thus only nonstative verbs can possibly participate in such ambiguity. The following, for instance, can never be understood to be structurally representing subordination:

i) a. Hanako-wa gakusei de zyoyuu da
   Hanako student and actress is
   "Hanako is a student and an actress."

b. Boo-wa kenkoo de kirei
   Bo healthy and pretty
   "Bo is healthy and pretty."

In the following discussion our examination is centered on coordinate structures, and hence whenever structural ambiguity is perceivable, it is to be understood that subordinate reading is systematically disregarded.
It is not clear why -te/-i conjunction should have such structural ambiguity. Though part of it has got to be semantic (note the restriction on verbs above), evidence like the following indicates syntactic subordination:

ii) (= Kuno's (14); I omit -i conjunction.)
   a. John wa boosi o nui-de, Mary ni aisatusita
       hat     take off      to greeted
       'John took off his hat and greeted Mary.'
   b. John wa, Mary ni, boosi o nui-de aisatusita

Since Scrambling must be defined clause internally, that Mary ni "to Mary" can jump over boosi o nui-de "took of his hat and" as in (b) strongly suggests that the latter is a single daughter constituent of the major clause as is Mary ni "to Mary". Note, furthermore, that the following is completely ungrammatical:

iii) *John-wa boosi-o Mary-ni nui-de aisatusita
   John   hat  Mary-to take off-and greeted

where the constituent Mary-ni "to Mary" has come between boosi-o and nui-de; this follows automatically if we assume that the sequence boosi-o nui-de "took off his hat and" is somehow a subordinate clause - no major clause constituent can go into a subordinate clause (by Scrambling). Evidence
like this shows, I believe, that when -te conjunction indicates subordination (under certain conditions), it has been partly syntacticized and must be considered structurally subordinate.

21 Mikami (1972: 167, 230) regards -te form to be morphologically a past conjunctive form and -i form to be morphologically a present or imperfective conjunctive form.

22 Again see Kuno (1973: Chapter 17), where -te/-i conjunction is always given side by side.

23 This is not to say that -te/-i forms of verbs represent styles; it only means what it says: -te conjunction represents informal style, and -i conjunction represents formal style. These forms in other functions are entirely a different matter. These appear, for instance, in compound verbs in either style: odot-te miru "try to dance", odor-i hazimeru "begin to dance", etc. Since the copula has different forms depending on the style, the most typical conjunctive form of the copula according to the style is:

i) informal ... de (i.e., da-te)
formal ..... deari (i.e., dear-i).
The main verb in Japanese can be simply defined as a linear notion of the following sort:

i) the main verb of $t = \text{df. the last tensed verb in } t$.

The notion "of the same tense" in S10ii simply means that main verbs of both conjuncts have \textit{Pres or Past}.

When we also take disjunction into consideration (cf. section 2.6 below), this is in apparent conflict with the bastard principle (p.75 and footnote 32 to Chapter III); \textit{si}, for instance, is not the only predicted item that appears in the position marked "*" below:

\begin{itemize}
  \item i)
\end{itemize}

\begin{center}
\begin{tikzpicture}
  \node (t) {t};
  \node (t1) [below left of=t] {t}
  \node (t2) [below right of=t] {t}
  \node (star) [below of=t, xshift=-2cm] {*};

  \draw (t) -- (t1);
  \draw (t) -- (t2);
\end{tikzpicture}
\end{center}

\textit{Si} as well as the disjunctive particle \textit{ka} may occupy this position. Depending on \textit{si} "and" or \textit{ka} "or", the structure above has to be translated differently. It was exactly this situation that the bastard principle demanded non-syncategoretic treatment of the words or expressions to be introduced. Though such "lexical" treatment of \textit{si} and \textit{ka}
is not impossible if we translate them $\lambda p \lambda q[p \& q]$, $\lambda p \lambda q[p \lor q]$ respectively, I feel rather that the bastard principle as a good working principle to abide by ought to be relaxed and limited to syntactic treatments of "non-function" words, that is, grammatical formatives and a closed set of lexical items must be made immune to this principle. The bastard principle in a sense is thus somewhat similar to conditions on deletion transformations.

26 See footnote 20 as to the structural ambiguity of -te/-i conjunction.

27 Morphologically this is -ita-gar-Pres; -gar-Pres is affixed to a certain set of adjectives (normally those denoting feelings and emotions) to derive the corresponding verb that has an inchoative sense: -kowa-i "be afraid", -kowa-garu "feel/become afraid"; tumeta-i "be cold", tumeta-garu "feel cold", etc. Thus, the form -itagaru is a combination of the adjectival suffix -ita-i "be desirous" and the verbalizer -garu, resulting in -ita-garu "feel desirous, or want (to)". But throughout we pretend as if this were a simple verb, the distinction between -ita-i "be desirous (to)" and -ita-garu being mostly a matter of usage (having to do in part with grammatical person) that does not have direct relevance to our major concerns.
28 In addition to the reading given in (46b), it has another reading that is synonymous to (46a). But this reading does not necessarily have to be derived in a parallel manner to that for (46a) (cf. (63) below) although it is possible to do so without contradicting any other proposal that is to be made below. Though (46a) reading of (46b) is a possible reading, the verbs involved in the conjuncts strongly prefer the reading given as a gloss to (46b), a matter which we cannot go into in this dissertation.

29 Recall that kappa is a CN; see footnote 33 to Chapter III for the explanation of kappa.

30 Another possible, and very strong, argument for IV-conjunction within PTQ framework has to do with the interaction of quantification and intensional contexts, but as is explained in section 2.5, we do not adopt Japanese version of IV-quantification, hence such a potential argument for IV-conjunction becomes non-argument in our grammar. For details, see section 2.5 below.

31 One might argue against the structure (64b) based on the behavior of soo suru transformation, or "do so transformation". But because of sloppy identity problem, it is not at all clear that such a transformation, if it is a transformation, must refer to a single syntactic node. There
is also the possibility that *soo suru* "do so" arises, not through the standard transformation, but through a kind of binding very much like bound pronouns do through quantification. Further still, *soo suru* "do so" may turn out to be a verbal version of a lazy pronoun. Hence, at the present state of our knowledge of this "transformation", it appears premature to argue against (64b) based on such a transformation.

32 For the form *de*, see footnote 23 to this chapter.

33 For meager evidence for CN-quantification within PTQ framework, see Partee (1975: 235f). As Partee (1979) makes a passing mention, the pronoun that is a result of CN-quantification may better be understood to be a pronoun of laziness, and if so, we may be able to dispense with CN-quantification, too. Thus the only quantification we need, if the argument in this section holds, may be sentential quantification.

34 The feature specification of PRO is dispensed with in favor of the actual pronominal form. For details, see S9, p.222 and footnote 16 to this chapter.

35 To illustrate some of these complications, alongside (a) below, (b) is also an acceptable, and perhaps more basic,
form of IV disjunction.

i) a. Ziroo-ga odoru ka utau
   Ziroo dance or sing
   "Ziroo dances or sings."

   b. Ziroo-ga odoru ka utau ka suru
      Ziroo dance or sing or do
      (lit.) "Ziroo does either dance or sing."

Note that the imperative of IV disjunction must be patterned on (b) above. Thus:

ii) a. *odor-e ka uta-e
      dance-Imp or sing-Imp

   b. odoru ka utau ka si-ro
      dance or sing or do-Imp
      "Dance or sing!"

Similarly, while Honorification may convert either (ia) or (ib) to honorific forms, the second version sounds far less awkward:

iii) a. Ziroo-san-ga o-odor-ininaru ka o-uta-ininaru
      Ziroo (polite) dance (honor.) or sing (honor.)
      "Ziroo dances or sings."
b. Ziroo-san-ga odoru ka utau ka nasaru
   Ziroo (polite) dance or sing or do (honor.)
   "Ziroo dances or sings."

Turning to t-disjunction, alongside (a), we have (b).

iv) a. Taroo-ga odoru ka Hanako-ga utau
       Taroo dance or Hanako sing
       "Taroo dances or Hanako sings."

b. Taroo-ga odoru ka Hanako-ga utau ka da
   Taroo dance or Hanako sing or is
   (lit.) "(It) is (that) either Taroo dances or Hanako sings."

The negation of sentential disjunction, unless other sentence patterns are used (see section 3 below), must be defined on pattern (b) above:

v) a. Taroo-ga odoru ka Hanako-ga utaw-anai
       Taroo dance or Hanako sing-Neg
       "Taroo dances or Hanako does not sing."

b. Taroo-ga odoru ka Hanako-ga utau ka de-(wa)-nai
   Taroo dance or Hanako sing or is-(Topic)-Neg
   "It is not (the case) that Taroo dances or Hanako sings."
Note that (a) above is semantically different from the negation of the sentential disjunction (iva). Although I believe these and other complications having to do with disjunction can be integrated into our grammar, I will ignore these patterns in our grammar.

36 For the alternation -anai :: -nai, see footnote 18 to this chapter.

37 In case of adjectives, the form -ku- appears between the adjective stem and the negative morpheme; waka-i "young" thus becomes, when negated, waka-ku-anai, which, due to the alternation noted in footnote 18 above, becomes waka-ku-nai. The negative of copula da is denai, which is represented as de-nai throughout.

38 Kuno (1980: 78): the point of his discussion pertaining to our major concerns is that the negation takes the narrowest scope possible in Japanese except when a sentence of the form t no da or a sentence that contains a quantifier is negated, in which case the scope of negation may be wider than other scope interactors within such sentences. He qualifies his conclusion by saying that his hypothesis "is still at the stage of conjecture. However, it seems that there are enough question and negation facts in the language which would be totally unexplainable without such a hypothesis,
and it seems that it is worthwhile to pursue this line of approach in future research."

39 But cf. section 3.1.4 below.

40 In the standard sense of analyzability as used in generative grammars.

41 For the notion "contains", see footnote 27 to Chapter IV. "Coordinate node" here includes both conjunction and disjunction. Cf. (96), p.261 and section 2.6 for conjunctive and disjunctive nodes.

42 For -te form of copula da, see footnote 23 to this chapter.

43 This sentence in isolation sounds a little awkward, even with the topic particle wa; de-mo-nai "is-even-Neg" instead of de-nai "is-Neg" makes it sound more natural. But in the following sentence, in which it appears embedded, it is perfectly fine.

i) Hanako-ga isya de-naku-te bengosi de-nai to sitara

   Hanako doctor be-Neg-and lawyer be-Neg if
"If Hanako is not a doctor and is not a lawyer, what in the world is she?"

As pointed out in footnote 35 above, a more normal and perhaps basic IV-disjunction is the following:

i) Hanako-wa isya de-nai ka bengosi de-nai ka da
   Hanako doctor be-Neg or lawyer be-Neg or is
   "Hanako either is not a doctor or is not a lawyer."

which sounds more natural than (132b) though both are equally acceptable.

There are actually two -te forms of the negative -nai: -nai-de and -naku-te. For basic differences between these two forms, see, for instance, McGloin (1976).

Cf. also footnote 38 above.

The point can be also argued for, based on the negation of t-disjunction (cf. footnote 35 above) of the form:

i) t ka t ka da
   t or t or is
   "Either t or t."
where da "is" must be introduced syncategorematically. Hence in order to negate this sentence to get the form:

ii) \( t \ ka \ t \ ka \ de-nai \)

\( t \ or \ t \ or \ be-Neg \)

"(It) is not that \( t \ or \ t \)."

we have to be able to negate the first formula (i) as a whole; hence, negation in our grammar must be formulated in such a way that it syntactically negates a formula.

48 Cf. footnote 13, Chapter IV.

49 There is another daremo meaning "anybody" as in:

i) a. \( \text{daremo-ga kuru} \)

anybody come

"Anybody/Everybody comes."

b. \( \text{Hanako-wa daremo-to odoru} \)

Hanako anybody-with dance

"Hanako dances with anybody/everybody."

c. \( \text{Taroo-wa daremo-o nagutta} \)

Taroo anybody hit

"Taroo hit anybody/everybody."

It appears it is best to regard this daremo as a member of
the set $B_T$. Note that unlike *dareka*, which may appear either alone (via hito-deletion SS2) as a T or as a Q, *daremo*, in the above sense, never appears as a Q. Compare the following with the above.

ii) a. *daremo* hito-ga kuru

    person

b. *Hanako-wa daremo hito-to odoru

    person-with

c. *Taroo-wa daremo hito-o nagutta

    person

But *daremo* as a negative polarity item of *dareka* does appear as a Q as in (149). Thus *daremo* in the sense of "anybody/everybody" should perhaps be regarded as a basic word in the set $B_T$ having the special translation:

iii) $\lambda F(\forall x)[\text{hito}'(x) \rightarrow \forall P(x)]$.  

To be precise, Q-floated and then scrambled version of (b).

Very roughly, and disregarding the case of the genitive particle *no*, the sequence in the left column below has to be realized as that in the corresponding right column:
i)  

| daremo-ga  | daremo         |
| daremo-o   | daremo         |
| daremo-ni  | dare-ni-mo     |
| daremo-kara| dare-kara-mo   |
| daremo-e   | dare-e-mo      |
| daremo-to  | dare-to-mo     |

That is to say, the following conversion has to take place:

ii)  

dare-mo-P  \rightarrow  dare-P-mo

where P is a case/adverbial particle.

Furthermore, ga or o has to be deleted if followed by mo. Since this process is not isolated to mo only but common to other expressions like koso, sika "only", sae "ever", wa "Topic", etc., it should be treated separately from the negation itself.

Where a genitive no appears after daremo, mo must be attached to the position right after the particle that attaches to the genitive construction as a whole:

iii) a. 1. dareka no imooto-ga kuru

someone 's sister come
"Someone's sister comes."

2. *daremo no imooto-ga ko-nai

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3. **dare no imooto-mo ko-nai**
   "No one's sister comes."

b. 1. **Taroo-wa dareka no imooto-to odoru**
   **Taroo** someone 's sister-with dance
   "Taroo dances with someone's sister."

2. **∗Taroo-wa daremo no imooto-to odor-anai**
   **Taroo** anyone 's sister-with dance-Neg

3. **Taroo-wa dare no imooto-to-mo odor-anai**
   "Taroo does not dance with anyone's sister."

c. 1. **Taroo-wa dareka no imooto no tomodati-to odoru**
   **Taroo** someone 's sister 's friend-with dance
   "Taroo dances with someone's sister's friend."

2. **∗Taroo-wa daremo no imooto no tomodati-to odor-anai**
   **Taroo** anyone 's sister 's friend-with dance-Neg

3. **Taroo-wa dare no imooto no tomodati-to-mo odor-anai**
   "Taroo does not dance with anyone's sister's friend."

In effect, the following change is required to occur:

iv) **dare-mo-X-P** → **dare-X-P-mo**

   where i) P is a case/adverbial particle, and
   ii) X does not contain any P.

52 Some of these include aspectual verbs like hazimaru -
hazimeru "begin", owaru - ceru "end" (cf. Shibatani (1973b)), and transitive subject-equi verbs like yakusokusuru "promise", etc. (though the latter is in fact included in the Fragment in a very tentative form (cf. Appendix C)).

53 For semantic reasons, the passive of (154i) tends to be interpreted as an indirect passive (cf. section 5 below).

54 For purely formal reasons, -itagaru "want (to)" and -yoo to suru "try (to)" may attach only to lexical verbs.

55 Some of these other cases are: -te hosii "want someone to", -te morau "receive someone's favor by his V-ing", etc. The verb suru is more or less in complementary distribution with -saseru to be discussed below. The former syntactically combines with adjectives and copula predicates while the latter combines with verbs (though the expression -yooni suru may combine with verbs). Semantically suru is an inchoative causative:

i) Taroo-ga heya-o kura-ku-suru

Taroo room dark-(ku)-do

"Taroo makes the room become dark."

Using the Japanese word naru "become" for the inchoative sense, suru thus may be translated as follows (cf. 4.2.2):
\[ \lambda \mathcal{P} \lambda \mathcal{E} \lambda x \text{saseru}'(x, \tilde{\text{naru}'}(\tilde{x}_i)). \]


57 This is not a necessary assumption. One could, for instance, posit only one \text{saseru} that takes the structure:

\begin{enumerate}
\item[i)]
\begin{tikzpicture}
  \node (S) at (0,0) {S};
  \node (NP) at (-2,-3) {NP};
  \node (NP_i) at (0,-3) {NP_i};
  \node (S) at (2,-3) {S};
  \node (V) at (4,-3) {V};
  \draw (S) -- (NP);
  \draw (S) -- (NP_i);
  \draw (S) -- (V);
\end{tikzpicture}
\end{enumerate}

and then derive the \text{o}-causative construction by standard Equi-NP Deletion and the \text{ni}-causative by something like Kuroda's Counter Equi-NP Deletion (cf. Tonoike (1979)) that deletes the matrix NP\textsubscript{i} with subsequent raising of the complement NP\textsubscript{i} (or equivalently Verb Raising). If one believes in non-compositional semantics, one can write semantic effects of such transformations precisely.

58 For mnemonic purpose, associate \text{o} with the relational label for direct object 2, and \text{ni} with the agentivity, hence typically subject, hence the relational label 1.
59 S22 is to be generalized to other cases of obligatory object-equi (cf. footnote 55 above).

60 Tonoike (1979: 182).


62 As Tonoike (1979: section 4.3.3) correctly points out, this is acceptable when understood to mean "Taroo makes Hanako pretend to grieve (over something)," where the meaning of kanasimu "grieve (over something)" has been shifted to that of a self-controllable predicate synonymous to "pretend to grieve (over something)". In this connection, (170iiib) becomes also acceptable if used, say, in a children's make-believe story where a (personified) carrot is ordered by someone to self-degrade. Both (a) and (b) are thus acceptable if the predicates are reinterpreted to be self-controllable.

Although Tonoike's observation that sentences like the ones in (170ii) are acceptable only if they receive "pretense" interpretations is correct, his position that they are to be marked as syntactically ill-formed (because of his syntactic constraint of self-controllability on the complement predicate of a ni-causative) has been challenged by Kuno (1978: 226f) with examples like the following, where yorokobu "rejoice" is not a self-controllable predicate:
I share Kuno's judgment that (i) above "seems to be acceptable without any pretense interpretation (p.227)." But if, as Tonoike (1979) claims, every ni-causative sentence with a non-self-controllable complement predicate is to be marked as ungrammatical, there would be no way to generate sentences like (i) in Tonoike's framework. Kuno's solution that covers both (170ii) and (i) above is partly syntactic and partly semantic. For details, see Kuno (1978: 228 and footnote 10). For our purpose, I would like to consider that, as mentioned in the text, sentences like (170ii) are syntactically well-formed but semantically anomalous; as for sentences like (i) above, let us tentatively assume, as Kuno does, that -te oku "to leave untouched, not to prevent" pattern, when added to sentences like (170ii), somehow increases their acceptability because of a certain "modal coloring" it adds to the sentence. But how such "modal coloring" fits the compositionality of meaning is not clear to me. In this respect, the treatment of sentences like (i) must be left as one of the future tasks for anyone interested in causative constructions in Japanese.

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Cf. Dowty (1976), McCawley (1976), etc.

Cf. footnote 62 above.

The problem remains as to how we should regard such a formula semantically: is it false? or is it neither true nor false? This in part is related to whether we should let "zibun-de' '(lit.) by self" a complete function or a partial function. For our purpose, we regard such a formula to be always false (though zero-value seems intuitively more appropriate).

This characterization is not precise enough since sentences with two o-marked NPs are grammatical if these NPs appear separately in each of the conjunct:

i) Taroo-ga mizu-o non-de pan-o taberu
   Taroo water drink-and bread eat
   "Taroo drinks water and eats bread."

So the condition as stated is at most a hedge. Another example indicating the inadequacy of the double-o constraint as stated is the following, which is due to John Haig:

ii) Yosiroo-ga uma-o saka-o nobor-ase-nagara kangaeteita
    Yosiroo horse slope climb-cause-ing was thinking
(lit.) "Yosiroo was thinking, causing his horse to climb up the slope."

As with Tonoike (1979), I would like to regard sentences like (182b) to be unambiguous between the o-causative and the ni-causative readings although some hold an opinion to the contrary.

As was mentioned in footnote 20 to this chapter, (186a) is actually ambiguous. The reading that is NOT intended for our discussion is the one on which odot-te semantically constitutes a subordinate clause and is equivalent to:

i) Taroo-ga odot-te Hanako-ni utaw-aseru
   "Taroo, (by) dancing, lets Hanako sing."

That is, Taroo's dancing causes Hanako's singing. Again as was indicated in footnote 20, it is not at all clear why or how such a subordinate reading obtains for what is apparently a coordinate conjunction; maybe the notion of asymmetric conjunction that represents time sequence like English "and (then)" is of relevance here, but facts about Scrambling mentioned there are still hard to explain unless syntactic subordination is posited for this type of sentences.

70 The latter is also called "adversity passive" because of the semantic characteristic it has, as noted below (though Howard and Niyekawa-Howard (1976) maintain that every passive has an adversity connotation).

71 "There are some apparent counterexamples," as Kuno (1973: 24) notes, "such as

\[(56) \text{Boku wa kodomo o sensei ni home-rare-ta.}\]

I child teacher by praise-passive-ed

'(Lit.) I was adversely affected by the teacher's praising my child.'

..., the speaker was not really adversely affected by the teacher's praising his child. However, it seems that this sentence is a reflection of the traditional Japanese attitude, ..., that modesty is a virtue and that one should not boast about his or his family's merit. ... that the speaker was embarrassed (thus adversely affected) by the teacher's praising his child, thus giving the speaker the pretense that he was not really bragging about his child."

72 That is, there is no (indirect) passive of copulas and adjectives. In addition to this restriction, Jacobsen
(1979: 167), based on Mikami (1972), gives verbs like aru "be (of existence)", ureru "sell (as in '(books) sell')", and some other intransitives as not being capable of forming indirect passives although I find a sentence like the following to be perfectly acceptable.

i) kono hon-\text{-}ni koo ure-rareru \text{ to } zaiko-ga suguni
this book-by this much sell-Pass and stock soon

nakunaru node komaru
become non-existent because be in a spot
"(We) are adversely affected by this book selling this much, for we will soon be out of stock and be in a spot."

73 Sonkeisuru "respect" (and in general any verb ending with suru "do") is irregular; in the present context, we can regard it as a consonant stem verb, as we do with the example (197).

74 Tonoike (1979) goes one step further and proposes that the passive morpheme rareru be considered a three-place predicate. Thus, where Howard and Niyekawa-Howard (1976) would have (b) below as a deep structure for the passive of (a), he has (c).
i) a. **Taroo-ga Hanako-o naguru**

   Taroo  Hanako  hit

   "Taroo hits Hanako."

b. **Hanako-ga [Taroo-ga Hanako-o nagur-]**S -rareru

c. **Hanako-ga Taroo-ni [Taroo-ga Hanako-o nagur-]**S -rareru.

Neither approach is in consonance with ours because (b) and (c) are not well-formed (surface) expressions of category t.

75 Cf. Dowty (1978c: 399ff).

76 *Niyotte* only marks the agent of the direct passive, an observation credited to J. McCawley by Kuno (1973: 346).

77 Should (b) be ambiguous, we may have to abandon our position that subjects are in general extensional (cf. PTQ Meaning Postulate 3). Note that the standard approach would take it that (b) and (a) are similarly ambiguous as to the extensionality of kappa. Cf. also Bennett (1975: Chapter 6, section 6.0).

78 It is an example like this that directly motivated Howard and Niyekawa-Howard's (1976) RCC (cf. p.215 above). Note that their deep structure for (220) would be:

i) **Taroo-ga [Hanako-ga Taroo-o Hanako-no-heya-de nagur-]**S -rareru
to which the standard Reflexivization may apply first in the first cycle and then in the second cycle, resulting in:

ii) Taroo-ga [Hanako-ga zibun-o zibun-no-heya-de nagur-]_g
   . -rareru,

where, it is to be noted, the first and the second occurrences of zibun refer to different antecedents; hence the tree is marked ungrammatical by RCC.

79 For some reason I do not understand, in this example, I find odor-as-areru more appropriate than odor-ase-rareru; that is, I prefer the stem form -sas over -sase here. This is probably because I speak a variant of the Osaka dialect: Shibatani (1973a: footnote 21) thus notes that "In the Kansai area, e.g., Osaka, still the sas form is much more often used than the sase form."

80 I will use the agentive particle niyotte in order to avoid the awkward repetition of ni.
0. **Introduction.**

So far the syntactic Ts of our examples, except in a few specifically annotated cases, have been limited to PNs, pronouns and quantified expressions. Besides these, Japanese abounds in expressions like:

1) a. *inu-ga aruku*
   
dog walk
   (lit.) "Dog walk."

b. *Hanako-ga inu-o keru*
   
Hanako dog kick
   (lit.) "Hanako kicks dog."

where CNs appear without any modifier and yet seem syntactically and semantically functioning as Ts. We will call CNs appearing in such a function bare CNs and note their characteristics in this chapter. In section 1, we outline the sense in which bare CNs must be regarded as syntactic Ts (1.0) and then characterize their basic semantics (1.1). Section 2 is an examination of the first sub-type, indefi-
nite bare CNs; we will indicate the desirability for treating them as if they were quantified expressions based on facts about reflexivization (2.0), quantifier scope (2.1), negation (2.2), intensional context (2.3), and deductive patterns (2.4). Then in section 2.5 we propose a rule for deriving indefinite bare CNs. Section 3 is an examination of a second sub-type, definite bare CNs. We examine and reject the possibility of regarding them PNs (3.0) and deictic pronouns (3.1). We propose then that definite bare CNs be regarded as being equivalent to definite descriptions, based on facts about reference (3.2). Then in section 3.3 we note some similarities between definite bare CNs and lazy pronouns. Section 4 is a discussion of relative clauses. After preliminary remarks (4.0), we give rules for deriving CNs (which serve as the bases for restrictive relative clauses) and for deriving nonrestrictive relative clauses (4.1), which distinction is syntactically motivated for Japanese (4.2). Then in section 4.3 we describe a situation where such distinction is neutralized, followed by a section (4.4) on some remaining problems. Section 5 presents a summary of the chapter.
1. Some syntactic and semantic features of bare CNs.

1.0. Bare CNs and Ts.

In every sense of the term, a bare CN functions as a syntactic T: anywhere a T may appear, a bare CN may appear, and vice versa.

2) a. Subject:

Hanako/inu-ga kita
Hanako/dog came
(lit.) "Hanako/dog came."

b. Direct object:

Taroo-ga Hanako/inu-o keru
Taroo Hanako/dog kick
(lit.) "Taroo kicks Hanako/dog."

c. Indirect object:

Taroo-ga okasi-o Hanako/inu-ni ataeta
Taroo candy Hanako/dog gave
(lit.) "Taroo gave candy to Hanako/dog."

d. Passive agent:

Taroo-ga Hanako-ni/inu-ni kamareta
Taroo Hanako-by/dog-by was bitten
(lit.) "Taroo was bitten by Hanako/dog."

etc.
Similarly, any rule that affects a T may affect a bare CN:

3) a. Reflexivization (as part of S2):

    Hanako/gakusei-ga zibun-o semeru
     Hanako/student self accuse
    (lit.) "Hanako/student accuses self."

b. Quantification (S9):

    Taroo-ga Hanako/gakusei-to kanozyo/kare-no-syoorai-
       Taroo Hanako/student-with she/he's-future-

    nituite hanasu
     about talk
    (lit.) "Taroo talks with Hanako/student about her/his
     future."

c. Conjunction Particle Insertion (SS8):

    i. Taroo to Hanako to-ga kita
       Taroo and Hanako and came
        "Taroo and Hanako (and) came."

    ii. inu to gakusei to-ga kita
        dog and student and came
        (lit.) "Dog and student (and) came."

    etc.

But if a CN appears with a modifier like a Q, a T and a CN
are no longer substitutable without affecting the grammati-
cality:
4) i. a. dareka gakusei-ga kuru
   some student come
   "Some student comes."

   b. *dareka Hanako-ga kuru

ii. a. gakusei-ga dareka kuru
   student some come
   "Some student comes."

   b. *Hanako-ga dareka kuru.

So the question is: why does only a bare CN function syntactically like a T? and how is the distinction between a bare CN and other "ordinary" CNs to be reflected within our framework? If we were to syntactically differentiate Ts and bare CNs, it would appear that we would have to double the number of syntactic rules so that corresponding to every rule that has to do with a T, we have a rule that has to do with a bare CN; moreover, such a pair of rules must have exactly the same syntactic operations.¹ This is tantamount to saying that we would be missing a syntactic generalization that is obviously there. If we can somehow find a way for treating bare CNs as syntactic Ts, then the features that we noted with respect to examples like (2) – (4) all follow from the way we have formulated our syntactic rules. We cannot simply declare, however, that a bare CN be a T because their semantic types differ: a CN is of semantic type <e,t> while a T is of type «s,<e,t>,t». Thus whether we achieve such apparent category change
from CN to T by some reasonably motivated syntactic rule or by by-fiat declaration, we have to be able to back it up with a corresponding semantic characterization that would have an effect of type shift. Before we can examine this possibility, let us below see what kind of meaning bare CNs most closely represent in Japanese sentences.

1.1. Definite and indefinite bare CNs.

Observe now sentences like the following that contain bare CNs; these seem systematically ambiguous between the two readings as given where the interpretation of the bare CN is concerned.

5) a. Ziroo-ga inu-o ketta
   Ziroo    dog    kicked
   i. "Ziroo kicked a dog."
   ii. "Ziroo kicked the dog."

b. Hanako-ga otoko-o nagutta
   Hanako   man    hit
   i. "Hanako hit a man."
   ii. "Hanako hit the man."

The ambiguity thus has to do with an indefinite and definite interpretation of the bare CN inu "dog" and otoko "man".
(5a), for instance, is appropriate to describe Ziroo's "dog-kicking" under either of the two situations like:

6) a. Ziroo, overtaken by a childish temper tantrum, indulges himself in a kicking spree to steam out his frustrated feelings; he kicks everything in his way – a can, a rock, an electric pole, a dog, or whatever.

   b. A dog comes barking at Ziroo, who thereby retaliates by kicking the dog.

Put in a discourse, the particle wa is to be preferred over ga if the sentences in (5) are to be used in isolation (since it is most likely that Ziroo or Hanako is the topic of conversation). But clearly the definite and indefinite ambiguity is there. If one is not entirely happy with sentence (5a) in isolation under the situations (a) and (b) above, we can embed it and say, for instance:

7) a. hazime-ni Ziroo-wa akikan-o ketta; tugi-ni isi to
first Ziroo empty can kicked; next rock and
dentyuu-o ketta. Sono tugi-ni Ziroo-ga inu-o ketta
electric pole kicked. the next time Ziroo dog kicked
toki keikan-ga kita.
when policeman came.

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"First Ziroo kicked an empty can; next he kicked a rock and an electric pole. When he kicked a dog the next time, a policeman came."

b. Hanako-wa Ziroo-ga inu-o ketta node gakkari sita
   Hanako Ziroo dog kicked because was disappointed
   "Hanako was disappointed because Ziroo kicked the dog."

Let us call those bare CNs that have an indefinite interpretation indefinite (bare) CNs, and those with a definite reading definite (bare) CNs. While it would be ideal if we could find a unique semantic treatment for both of these types of bare CNs, we will discuss them separately in the absence of plausible pragmatic characterizations of these CNs. Our task is then to specify how such distinct readings may be derived within our grammar without too much syntactic and semantic ad-hocity. We will discuss indefinite bare CNs first in section 2, and then definite bare CNs in section 3.

2. Indefinite bare CNs.

   CNs of this type share several characteristics of quantified expressions, especially existentially quantified CNs. Let us see below (2.0 - 2.4) in what respects indefinite bare CNs behave syntactically and semantically like existentially
quantified CNs. Our examination will show that Japanese indefinite bare CNs cannot be treated like English bare nouns in the manner of Carlson (1978), who convincingly argues that a bare noun like dogs as in:

8) a. Dogs are barking outside.
   b. Dogs are sleeping on the doormat.

is to be semantically treated on a par with proper nouns based on observations about quantifier scopes, negation, intensional contexts, etc. and that the existential quantification that sentences of (8) seem to require with respect to the subject noun dogs is to be derived from the translation of each predicate involved. For details, see Carlson (1978). Though Carlson's approach is interesting and informative and seems to offer a genuine alternative to our proposal below, some of the features noted below about Japanese indefinite bare CNs indicate, I believe, that Japanese bare CNs must be considered to contain suitable quantifiers in their translations so that they may semantically behave like quantified CNs.

2.0. Reflexivization.

As we saw in section 1.1, Chapter V, it is generally
the case that whether one repeats or reflexivizes a quantified expression results in a semantic difference.

9) i. a. minna-ga minna-o aisiteiru
    everyone everyone love
    "Everyone loves everyone."

    b. minna-ga zibun-o aisiteiru
        self
        "Everyone loves himself."

ii. a. dareka-ga dareka-o semeru
    someone someone accuse
    "Someone accuses someone."

    b. dareka-ga zibun-o semeru
        self
        "Someone accuses himself."

In each case, (a) and (b) do not entail each other. This characteristic is not shared by a PN.

10) a. Hanako-ga Hanako-o semeru
    Hanako Hanako accuse
    "Hanako accuses Hanako."

    b. Hanako-ga zibun-o semeru
        self
        "Hanako accuses herself."
Though (10a) is a little awkward (cf. the discussion in section 1.1.5 in the preceding chapter), there is no doubt that it entails (10b), and _vice versa_.

Indefinite bare CNs follow the pattern of quantified CNs so that a reflexivized version (b) below is not synonymous with the non-reflexivized version (a):

11) i. a. _gakusei-ga gakusei-o ketta_
   
   _student student kicked_
   
   "A student kicked a student."

    b. _gakusei-ga zibun-o ketta_
   
   _self_
   
   "A student kicked himself."

ii. a. _inu-ga inu-no-sippo-o oikakeru_
   
   _dog dog-'s-tail chase_
   
   "A dog chases a dog's tail."

    b. _inu-ga zibun-no-sippo-o oikakeru_
   
   _self-'s-tail_
   
   "A dog chases its own tail."

If we assume that an indefinite bare CN is in some sense an existentially quantified CN, this fact about reflexivization will automatically follow from the way we have formulated our rule (cf. S2i and its corresponding translation). The translations of (11iia) and (11iib), for instance, will be:

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12) a. \( (\exists x)[\text{gakusei'}(x) \land (\exists y)[\text{gakusei'}(y) \land \text{keru'}(x,y)]] \)
   b. \( (\exists x)[\text{gakusei'}(x) \land \text{keru'}(x,x)] \).

Clearly (a) and (b) do not entail each other.

2.1. Q scopes.

Recall that in Chapter IV we saw that Qs participate in scope ambiguity phenomena.

13) a. \text{minna-ga dareka-o ketta} \\
    \begin{itemize}
    \item everyone someone kicked
    \item i. "For everyone, there was someone he kicked."
    \item ii. "There was someone such that everyone kicked him."
    \end{itemize}

b. \text{ooku-no hito-ga hutari-no zyoyuu-o mita} \\
   \begin{itemize}
   \item many person two actress saw
   \item i. "Of each and every one of a group of people who were many in number, he or she saw two actresses."
   \item ii. "There were two actresses such that many people saw them."
   \end{itemize}

Indefinite bare CNs also show such scope interaction. Observe:
14) a. minna-ga inu-o oikaketa  
   everyone dog chased  
   i. "For everyone, there was a dog he chased."
   ii. "There was a dog everyone chased."

b. subete-no kodomo-ga kame-o izimeteita  
   all child turtle tease  
   i. "For every child, there was a turtle he was teasing."
   ii. "There was a particular turtle every child was teasing."

Thus, in the beginning part of the famous folktale Urashima Taroo, in which, Taroo, a fisherman, upon coming to a shore, finds children beating and teasing a turtle, one may use (14b) to express Taroo's experience with the intended reading (ii). But more normally (14b) may mean (i). There is thus no doubt that indefinite bare CNs participate in scope ambiguity phenomena just like any other quantified CN expression.

2.2. Negation.

Recall here a remark made about the scope of negation in Japanese. In footnote 38 to the preceding chapter, I summarized Kuno's (1980: 78) position by saying that the point of his discussion is that negation takes the narrowest
scope possible in Japanese except when a sentence of the form *t no da* or a sentence that contains a quantifier is negated, in which case the scope of negation may be wider than other scope interactors within such sentences. This seems generally true, and even with our limited fragment of Japanese, we had to attach a special proviso about negating conjunction (cf. S20, p.283). A prime example showing such scope interaction with negation is:

15) **minna-no gakusei-ga ko-nakatta**
   
   *every student come-did not*
   
   "Every student did not come."

This may mean either "No student came," or "Not every student came." It may thus be considered that one of the characteristics of quantified expressions is that they may semantically take a narrower scope than the negative. But now observe the following sentences:

16) a. **Taroo-ga hon-o yom-anakatta**

   *Taroo book read-did not*

   "Taroo did not read a book."

   b. **Taroo-wa Hanako-ni zyouyuu-o syookais-inakatta**

   *Taroo Hanako actress introduce-did not*

   "Taroo did not introduce an actress to Hanako."
These sentences may mean respectively:

17) a. "Taroo did not read any book."
   b. "Taroo did not introduce any actress to Hanako."

If an indefinite bare CN did not have any quantifier sense associated with it, it would be difficult to imagine how one might derive these readings, especially given the tendency of negative to take the narrowest scope possible within a sentence in the absence of a Q in Japanese. But if, for instance, we assume that a bare CN hon "book" in (16a) is to be translated as $\lambda P(\exists x)[\text{hon}'(x) \& \forall P(x)]$, then reading (17a) is generated by simply negating the sentence:

18) **Taroo-ga hon-o yomu**

   Taroo book read

   "Taroo reads a book."

Our rule of negation will assign the translation that is equivalent to:

19) $\neg(\exists x)[\text{hon}'(x) \& \text{yomu}'(t,x)]$. 

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2.3. **Intensional context.**

Consider sentences like:

20) a. Taroo-wa Hanako-to kekkons-itagatta

   Taroo  Hanako-with marry-wanted (to)
   "Taroo wanted to marry Hanako."

   b. Taroo-wa amerikazin-to kekkons-itagatta

   American-with
   "Taroo wanted to marry an American."

While (a) is unambiguous, (b) is not, the ambiguity here revolving on what is known in linguistics circles as specificity. Thus (b) is appropriate to describe either the situation in which there was one particular American girl that Taroo wanted to marry or the situation in which Taroo wanted to marry any girl whosoever happened to be an American. Although there may be several ways to reflect this ambiguity, it can be most naturally reflected as a difference of scope if we assume that a quantifier is involved in the translation of a bare CN, as Montague does in PTQ. Thus, assuming that *amerikazin* "American" in (20b) translates as $\lambda P(jx)[amerikazin'(x) \& \forall P(x)]$, (20b) can be assigned two different translations that are equivalent to each of the following expressions.

21) a. tagaru'(t,\textasciitildekekconsuru'($\lambda P(jx)[amerikazin'(x) \& \forall P(x)]$))
b. \(\exists x[\text{amerikazin}'(x) \& \text{tagaru}'(t, ^{^b\text{kekkonsuru}}'(\lambda P^* P(x)))].\)

(21a) indicates that Taroo stands in tagaru "want (to)" relation to the property of marrying an American, while (21b) shows that there is a certain individual who is an American and that Taroo stands in tagaru "want (to)" relation to the property of marrying that individual.

Similarly, the following sentence is ambiguous as to the extensionality of the object.

22) Taroo-ga kappa-o sagasu

Taroo kappa seek.
"Taroo seeks a kappa."

Again by taking the bare CN kappa "kappa" to be translated as \(\lambda P(\exists x)[\text{kappa}'(x) \& \text{'P}(x)]\), such ambiguity may be revealed as a difference of scope involving an intensional context created by the verb sagasu "seek" and a quantifier that is present in the translation of kappa "kappa".

23) a. sagasu'(t, ^{^a\text{'P}}(\exists x)[\text{kappa}'(x) \& \text{'P}(x)]

b. \(\exists x[\text{kappa}'(x) \& \text{sagasu}'(t, x)].\)

Thus (a) says Taroo stands in sagasu "seek" relation to the property of some kappa while (b) says there is a specific
kappa such that Taroo stands in sagasu "seek" relation to it.

2.4. Deduction.

If we assume an existential quantifier in the translation of a bare CN, we can establish proof-theoretic validity of entailments having to do with indefinite bare CNs as an automatic consequence of rules of inference of existential quantifiers. For instance, given the usual assumption that Ziroo is a human, the first line (a) below entails (b):

24) a. Ziroo-ga aruku
    Ziroo walk
    "Ziroo walks."

b. hito-ga aruku
   man walk
   "A man walks."

Given the translation of each line (a) and (b) above as:

25) a. aruku'(z)

b. (\exists x)[hito'(x) & aruku'(x)],

we can derive (25b) as conclusion from (25a) straightforwardly:
26) 1. aruku'(z) : assumption
2. hito'(z) : assumption
3. aruku'(z) & hito'(z) : conjunction
4. hito'(z) & aruku'(z) : commutation
5. (∃x)[hito'(x) & aruku'(x)] : existential generalization.

Since the logical validity of entailments and others are based on a model in intensional logic, the proof theoretic rules of inference are, strictly speaking, dispensable in favor of semantic evaluation. But then, in order to establish the semantic validity of entailment that obtains in (24), it is essential that we be able to translate them as (25), which can then be semantically evaluated. So either way the conclusion is the same; it is best to assume a quantifier in the translation of an indefinite bare CN in Japanese.

2.5. A proposed rule for indefinite bare CNs.

We have thus far seen the desirability of regarding indefinite bare CNs as syntactic and semantic Ts that are parallel to existentially quantified CNs. We now turn to the problem of deriving a T from a CN that does not conflict with the semantics of an indefinite bare CN. Several alternatives suggest themselves, and I would like to outline two of them.

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(One might contemplate applying an approach like Carlson's (1978) to the description of Japanese bare CNs, but as mentioned at the outset (p.405), unless bare CNs are considered to contain quantifiers in their translations, scope interactions as we saw above in sections 2.1 and 2.3 are very difficult to explain.)

2.5.1. First alternative: a lexical approach.

Since an indefinite bare CN like inu "dog" or gakusei "student" as in:

27) inu-ga gakusei-o kanda
   dog     student     bit
   "A dog bit a student."

has an existential sense attached to it, the obvious way to reflect this is to set up a rule that converts every CN to a corresponding bare CN, which is syntactically a T. Such a rule may read like:

28) S29. (Indefinite Bare CN)
   If \( \alpha \in P_{CN} \), then \( F_{27}(\alpha) \in P_T \), where \( F_{27}(\alpha) = [\alpha]_T \).
   T29. If \( \alpha \in P_{CN} \) and \( \alpha \) translates as \( \alpha' \), then \( F_{27}(\alpha) \) translates as \( \lambda P(jx)[\alpha'(x) \& \, \, P(x)] \).

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Given this rule, (27), for instance, may be derived in the following manner:

29) \[
\text{inu} \quad \text{gakusei} \quad \text{kamu} \\
\text{inu} \quad \text{gakusei} \quad \text{kamu} \\
\text{"dog"} \quad \text{"student"}
\]

S29 in a sense is a claim that in Japanese any CN, whether basic or derived, may be turned into an indefinite bare CN, which it seems is true. Some of the examples of derived CNs turned bare CNs are:

30) a. Hanako-ga rippa-na zyoyuu-o naguru
   Hanako fine actress hit
   "Hanako hits a fine actress."

b. Taroo-ga moto daizin-o mitukeru
   Taroo former Minister find
   "Taroo finds a former Minister."

c. Taroo-ga Pikaso-ga kaita e-o katta
   Taroo Picasso painted picture bought
   "Taroo bought a picture Picasso painted."
Thus, in isolation, S29 captures most straightforwardly and most simply the syntax and semantics of indefinite bare CNs.

2.5.2. Second alternative: a syntactic approach.

Consider again a sentence like:

31) Taroo-ga zyoyuu-o aiseiteiru
    Taroo   actress   love
    "Taroo loves an actress."

Recall here the discussion of dareka in section 2.2, Chapter IV, where a sentence like the following was proposed to be derived in part by combining a Q dareka and a CN zyoyuu "actress".

32) Taroo-ga dareka zyoyuu-o aiseiteiru
    Taroo   some   actress   love
    "Taroo loves some actress."

But note that both (31) and (32) translate as:

33) (\exists x)[zyoyuu'(x) & aisu'(t,x)].

Since the only difference between (31) and (32) is the
absence or presence of the Q dareka, it is only natural that one would want to attempt to capture their syntactic relationship. This may be achieved, for instance, by a constant deletion like:

34) SS14'. (dareka-deletion)
    X, Q, CN, Y
    1, 2, 3, 4 ----→
    1, ∅, 3, 4

    where i) Q = dareka, and
    ii) 2 + 3 = T.

TT14'. Identity mapping.

Given SS14', (31), for instance, can be derived from (32) directly by deleting dareka:

35) Taroo-ga zyoyuu-o aisiteiru :SS14'
    Taroo-ga dareka zyoyuu-o aisiteiru

SS14' thus seems to claim that whenever the sequence dareka CN appears as a T, dareka may be deleted to form an indefinite bare CN. This is confirmed, for instance, by sentences like the following, where the presence or absence of dareka does not affect the grammaticality or the meaning of each sentence:

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36) a. Taroo-ga (dareka) zyoyuu-o naguru
   Taroo  (some)  actress  hit
   "Taroo hits an actress."

b. Hanako-ga (dareka) moto kasyu-o sagasu
   Hanako  (some)  former  singer  seek
   "Hanako seeks a former singer."

c. Taroo-ga (dareka)amerikazin-to kekkons-itagaru
   Taroo  (some)  American-with  marry-want  (to)
   "Taroo wants to marry an American."

This treatment of course does not necessarily mean that
sentences with or without dareka are pragmatically equiva-
 lent in the sense that they are always interchangeable in
any discourse situation. Thus as a story-starter, the
following, for instance, sounds most natural without dareka:

37) mukasi aru tokoro-ni (?dareka) oziisan-ga sundeita
   once  in  a  certain  place  (some)  old  man  was  living
   "Once there lived an old man in a certain place."

But this aspect seems to belong more appropriately to the
problem of style and usage, and hence does not constitute a
serious counterexample to the approach in question.

Similarly, the fact that no plausible source exists for
an indefinite bare CN when this denotes an animal as in:
38) **Taroo-ga inu-o keru**  
Taroo dog kick  
"Taroo kicks a dog."

may not be so serious an objection since the following could be considered as its source 4:

39) **Taroo-ga nanika inu-o keru**  
Taroo some(thing) dog kick  
"Taroo kicks some dog."

if we let Q in 814' be either dareka or nanika and if, as pointed out in footnote 13 to Chapter IV, we can expect a reasonable lexicographic study on the usage of the word nanika "some(thing)".

As for the choice between the first and the second alternatives, it is probably immaterial whichever we choose because of the limited scope of data we are covering in this study; since the first lexical approach seems to avoid some apparent problems the second syntactic approach faces, we will, for the purpose of the present fragment, opt for the first alternative, noting that the decision is more arbitrarily than grounded on some principle.5

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3. **Definite bare CNs.**

The notion definiteness\(^6\) seems to be associated with several types of syntactic constructions; the purpose of this section is to propose a translation for the definite bare CN that is more consistent than other approaches that are here considered.

3.0. **PNs and definite bare CNs.**

Since a PN is a definite noun in every sense of the term in that it can always pick up a particular individual at any index\(^7\), we might consider, for instance, *inu* in the second sentence to be a PN of some sort.

40) **Taro-o ga kado-o magaru to inu-ga hoetekita.**

   "When Taroo turned around a corner, a dog came barking."

   **Taro-o wa bikkurisite inu-o ketobasita**

   "Surprised, Taroo kicked off the dog."

Suppose we propose a function \(F_{50}\) that converts a CN *inu* to a PN (or rather T) and assign, via a translation rule, the following translation:
41) \( \lambda P^P(a) \), where \( a \) is a variable over individual dogs.

Suppose, furthermore, that the dog that Taroo kicked above is named Shiro. Then the second sentence in (40), omitting other details, would be equivalent to:

42) \( \text{ketobasu'}^*(t,s) \) \( (\text{ketobasu} \ "\text{kick off}" \).}

But such a translation misses the fact that Taroo kicked the dog that came barking at him — i.e., the contextual dependency of the reference of \text{inu} "dog" between the first and the second sentence; this is so because a PN can pick up its referent regardless of contexts. Thus it appears a definite bare CN must be considered something other than a PN. In fact, given the dependency of the preceding linguistic expression and what follows it, one might naturally wonder that it might be some kind of a pronoun, to which alternative interpretation I turn below.

3.1. Pronouns and definite bare CNs.

Before discussing the possibility of a definite bare CN being some sort of a pronoun, let us first see the usage of a deictic pronoun and briefly outline how its interpretation is effected.

Hanako came she was sick
"Hanako came. She was sick."

Since inter-sentential quantification is out of question, there being many cases where deictic pronouns appear discourse initially, the second sentence is best regarded as being equivalent to:

44) byookida'(x_i).

The value of x_i is then determined relative to a context. Its reference in other words depends on the contextual assignment of values to variables. This accords with our intuition since the second sentence of (43), if taken in isolation, is neutral as to who the referent of kanozyo "she" is.

Something similar is going on in (40). Thus if we take the second sentence in isolation, we cannot really tell which particular dog Taroo kicked; it is only through the help of the first sentence that we can get some idea as to which dog Taroo kicked. Although the possibility definitely exists that Taroo kicked an entirely different dog, the flow of discourse certainly points to the most likely situation; that is, Taroo kicked the dog that came barking at him. Thus,
instead of (42), we can come closer to the representation of the definite bare CN if we have the translation:

45) ketobasu'*(t,x_i).

Since x_i must be a dog, we can reflect this by assigning the translation like the following to the second sentence of (40).

46) inu'(x_i) & ketobasu'*(t,x_i).

Suppose then that a definite bare CN is in general derived from a sentence containing an occurrence of a subscripted pronoun in the following manner:

47) (Definite Bare CN)

If \( \alpha \in P_{CN} \), \( \phi \in P_t \) and \( \phi \) contains an occurrence of \( \text{PRO}_i \), then \( F_{51,i}(\alpha,\phi) \in P_t \), where \( F_{51,i}(\alpha,\phi) \) is the result of replacing every occurrence of \( \text{PRO}_i \) by \( \alpha \).

(Translation)

If \( \alpha \in P_{CN} \), \( \phi \in P_t \) and \( \alpha, \phi \) translate as \( \alpha' \), \( \phi' \) respectively, then \( F_{51,i}(\alpha,\phi) \) translates as \( \alpha'(x_i) \& \phi' \).

This approach can syntactically account for the termhood of the definite bare CN and semantically indicate the contextual dependency of its interpretation. Omitting details, the second sentence of (40) can be generated in the following manner.
48) \[
\text{Taroo-ga } \{[\text{[inu]}_{CN} T \text{ o}]_2 \text{ ketobasu} \quad : (47)
\]

\[\text{[inu]}_{CN} \quad \text{Taroo-ga } \{[\text{[\text{PRO}}_i T \text{ o}]_2 \text{ ketobasu} \quad :
\]

"dog" \quad "Taroo kicks \text{PRO}_i \text{ off.}"

Translation:

1. \text{Taroo-ga } \text{PRO}_i \text{-o ketobasu} \implies \text{ketobasu'}(t,x_i)

2. \text{Taroo-ga } \text{inu-o ketobasu} \implies
   \text{inu'}(x_i) \& \text{ketobasu'}(t,x_i) \quad : (47).

Note that the top line of the analysis tree (48) is equivalent to the tree:

49)

Some features of this approach to the treatment of the definite bare CN is 1) that the anaphoricity of the definite
bare CN is based on the anaphoricity of a deictic pronoun, 2) that the definiteness of the definite bare CN is grounded in the definiteness of a deictic pronoun, 3) that the bare CN acquires its termhood only derivatively by replacing a deictic pronoun, and 4) that the interpretation of a definite bare CN is completely parallel to the interpretation of a deictic pronoun. In this regard it is to be noted that the replacement of *inu* in the second sentence of (40) by the pronoun *sore* "it" results in a more or less synonymous discourse continuation. Thus the following discourse appears no different from (40) to describe the situation where Taroo kicked off the dog that came barking at him.

50) **Taroo-ga kado-o magaru to inu-ga hoetekita.**

   **Taroo-wa bikkurisite sore-o ketobasita.**

   *it*

   "When Taroo turned around a corner, a dog came barking. Surprised, Taroo kicked it off."

This treatment thus has a certain appeal both syntactically and semantically.

In spite of some attractive features of (47), it appears that this treatment is inadequate in at least two respects. First, there are cases where the definiteness of a definite bare CN does not seem to depend on the prior discourse; this
is especially true of relative clause constructions (cf. section 6.2.3, Chapter III). Thus the following sentence seems complete on its own.

51) **Taroo-ga tuki-ni saisyo-ni orita hito-o naguru**

  Taroo   moon-at first    landed person hit

"Taroo hits the person who first landed on the moon."

No contextual aid is necessary in evaluating the truth value of (51). But since an approach like (47) will assign a translation to (51) roughly like the following:

52) \([\text{hito}'(x_i) \& \text{tuki-ni saisyo-ni oriru}'(x_i) \] \& \[\text{naguru}^\times(t, x_i),\]

it makes (51) as if it were making a deictic reference to someone that occurs prior to (51).

While the above may not be too serious a problem, an example like the following poses an insurmountable difficulty for an approach like (47).\(^9\)

53) **kyonen gassyuuokoku daitooryoo-ga nihon-ni kita.**

  last year U.S. President         Japan-to came

"Last year the U.S. President came to Japan."
The U.S. President will come to Japan next year, too.

Disregarding the time adverbial, an approach like (47) will assign to the second sentence above a translation like the following, where $W$ is a future tense operator.

54) $W[daitooryoo'(x_i) \& nihon-ni'('kuru')(x_i)]$.

But note that while the translation (54) is fine so long as it is the same President that will be visiting Japan next year, this cannot express the meaning that the second sentence of (53) more normally has which may be paraphrased as:

55) Whoever is the U.S. President next year will visit Japan.

This is because a context of use can assign only one value at a time to a variable; hence $x_i$ in (54) must necessarily be assigned a particular individual for a given context of use. What is not expressed in (54), in other words, is the "whoever" sense. This, it seems to me, is a consequence of trying to treat a definite bare CN on a par with a deictic pronoun as in (47). What we need here is some appropriate quantification over individuals rather than a direct assignment of a particular individual to a variable relative to a given context.
It appears that whenever we have an intensional or opaque context, a similar problem will crop up; this is understandable because it is such a context where the traditional law of substitution of identicals fails, and hence at least in principle, no binding relation should obtain between the referent of an expression \( \alpha \) within such a context and that of the same expression \( \alpha \) outside it, while it is exactly such referential dependency a successful use of a deictic pronoun as an inter-sententially bound variable depends upon. Another similar example that points toward the inadequacy of an approach like (47) is:

56) Taroo-wa eigo-no wakaru zyosei-o sagasu si Hanako mo

\[\begin{align*}
\text{Taroo} & \quad \text{English understand woman seek and Hanako too} \\
\text{eigo-no wakaru zyosei-o sagasu} & \\
\text{English understand woman seek} & \\
\text{"Taroo seeks the woman who understands English, and} \\
\text{Hanako seeks the woman who understands English, too."}
\end{align*}\]

It is to be noted that (47) wrongly predicts that in (56) Hanako seeks a particular woman that, among other readings, is referentially bound with the woman Taroo seeks.
3.2. **Definite description and definite bare CNs.**

In order to express the meaning (55), it appears it is best to regard *gasshyūkoku daitooryoo* "U.S. President" in the second sentence of (53) as a definite description. This will yield a translation equivalent to:

57) \[ W[\text{nihon-}n\text{i'}(\text{'kuru'}) x[\text{dai}t\text{ooryoo'}(x)]\]

or

58) \[ W[\exists x(\forall y[\text{dai}t\text{ooryoo'}(y) x = y] \& n\text{ihon-}n\text{i'}(\text{'kuru'}) (x))] \]

(57) or (58) thus says that there will be one and only one person such that he is the U.S. President and he visits Japan. Such a translation will yield intensional reading to the second conjunct of (56), too. Moreover, treating a definite bare CN as a definite description also surmounts the first difficulty noted with respect to (51) about the approach (47) because, other things being equal, the interpretation of a sentence containing a definite description is not affected by a specific contextual assignment of values to variables.

As for the referentially bound cases like (40), this should be what we predict if we regard the second occurrence
of *INU* to be a definite description, for, omitting details\textsuperscript{12}, (40) will be equivalent to:

\begin{align*}
59) & 1. (\exists x) [INU'(x) \& HOERU'(x)] \\
& (INU "dog"; HOERU "bark") \\
& 2. (\exists x) [\forall y] [INU'(y) \iff x = y] \& KERU'_{\times}(t,x)] \\
& (KERU "kick")
\end{align*}

From these we can derive the conclusion:

\begin{align*}
60) & (\exists x) [[INU'(x) \& HOERU'(x)] \& KERU'_{\times}(t,x)]
\end{align*}

by familiar rules of logic.

It appears then that it is descriptively most adequate if we can regard a definite bare CN as semantically equivalent to a definite description. As was the case with an indefinite bare CN, we propose then the following category changing rule for deriving definite bare CNs for Japanese.

\begin{align*}
61) & S30. (Definite Bare CN) \\
& \text{If } \alpha \in \mathcal{P}_{\text{CN}}, \text{ then } F_{28}(\alpha) \in \mathcal{P}_T, \text{ where } F_{28}(\alpha) = [\alpha]_T. \\
& T30. \text{If } \alpha \in \mathcal{P}_{\text{CN}} \text{ and } \alpha \text{ translates as } \alpha', \text{ then } F_{28}(\alpha) \text{ translates as } \lambda p \forall p (\exists x [\alpha'(x)]).
\end{align*}

It is to be hoped that future research on the usage of bare
CNs in Japanese will reveal under what circumstances they may be used as indefinite or definite, a question that is beyond the scope of the present study.

3.3. Lazy pronouns and definite bare CNs.

Cooper (1979) notes that a sentence like the following exemplifies what is called a lazy pronoun (cf. footnote 9 above).

62) (= Cooper's (35a))

This year the president is a republican. Next year he will be a Democrat.

She says that (62) "can be interpreted in such a way that it does not require that the president (in 1976), Gerald Ford, is going to become a Democrat next year but rather that the next president of the United States will be a Democrat (p.73)." In other words, while an ordinary pronoun typically refers to some particular individual, he in (62) appears to be used as a substitute for the expression the president. Similarly Karttunen's well-known example (given as (47) in Cooper (1979: 77))13:

63) The man who gave his paycheck to his wife was wiser than
the man who gave it to his mistress.

exemplifies a parallel phenomenon; it in this sentence is not referring to any particular individual nor is it bound by any T phrase; it is simply the case that it, as it were, is used instead of the expression his paycheck. English thus seems to have a full-fledged use of a pronoun as a lazy pronoun. Japanese, which is often said to lack a "rich" pronom system, on the other hand, seems to have only a limited use of lazy pronouns. Note for instance that if we replace gassyuukoku daitooryoo "U.S. President" in the second sentence of (53) with kare "he", as in the following, we only get the bound reading:

64) kyonen gassyuukoku daitooryoo-ga nihon-ni kita.
    last year U.S. President Japan-to came

    "Last year the U.S. President came to Japan.

    rainen mo kare-wa nihon-ni kuru daroo
    next year too he Japan-to will come

    "He will come to Japan next year, too."

Suppose Jimmy Carter came to Japan in 1980 and that (64) is a mini-discourse that took place sometime in 1981. Then the second sentence is equivalent to "Jimmy Carter will come to Japan in 1982, too." Similarly, in the following example,
kanozyo "her" can only refer to the actress Taroo respects or someone deictically referred to but never the actress Ziroo respects, a possibility a lazy pronoun allows for\textsuperscript{14}.

65) 

\begin{quote}
Taroo-wa zibun-ga sonkeisuru zyoyuu-o nagutta.
\end{quote}

Taroo self respect actress hit

"Taroo hit the actress he respected.

Ziroo mo kanozyo-o nagutta.

Ziroo also her hit

"Ziroo also hit her."

Kanozyo "her" here cannot be sloppily or "lazily interpreted to be used for the expression zibun-ga sonkeisuru zyoyuu "actress self respects". In order to have the lazy reading, we have to use the CN zibun-ga (actually PRO\textsubscript{i}-ga) sonkeisuru zyoyuu; that is to say, we have to repeat the full expression. In general kare "he" and kanozyo "she", it seems, can only be used as bound pronouns or deictic pronouns, and whenever we need lazy reading as in (62), we have to repeat the full (definite) CN. Sore "it", on the other hand, does have a lazy pronoun reading as in:

66) (This is a slight variation of (63).)

\begin{quote}
Taroo-wa zibun no kyuuryoo-o tuma-ni watasita ga Ziroo-wa
Taroo self's paycheck wife-to gave but Ziroo
\end{quote}
sore-o mekake-ni watasita
it mistress gave
"Taroo gave his paycheck to his wife, but Ziroo gave it to his mistress."

Here sore "it" clearly refers to Ziroo's paycheck; hence it is being used as a mere substitute for the expression zibun no kyuuryoo "self's paycheck". I do not know why there is such an apparent hiatus in the lazy pronoun usage between sore "it" on one hand and kare "he" and kanozyo "she" on the other hand. One thing that is clear though is that where English employs he and she as lazy pronouns, Japanese repeats a full CN (or a T depending on the case), thereby enhancing the oft-noted tendency of Japanese to repeat, rather than pronominalize, nouns and noun phrases. Though we could perhaps analyze sore "it" as a lazy pronoun along the line of Cooper (1979), we will not integrate it into our grammar.15

4. Relative clauses.

4.0. Preliminaries.

As was noted on p.94, relative clauses in Japanese are basically CN-like; thus, formally, there is not much difference between bare CNs of the type we have been concerned with
and relative clause constructions. Since both are members of P_T, we might as well call them both bare CNs. The purpose of this section is to touch on the distinction of restrictive and nonrestrictive relative clauses in Japanese since the distinction bears on the way we formulate our rules of relative clause formation and their translations. Those concepts that have equally, if not more, important relevance to relative clauses, such as topic (cf. Kuno (1973; Chapter 21), Muraki (1974; Chapter IV)), tense and aspect (cf. Josephs (1972)), and other related constructions (cf. Teramura (1969)) cannot, unfortunately be discussed, these being, from the viewpoint of our grammatical framework, the toughest "toughies" and hence beyond the modest scope we originally set at the outset.\footnote{16} We will also ignore, regrettably, the important question on the conditions of relativization (cf. Inoue (1978)), noting simply that relativization in Japanese, if it is a deletion as opposed to pronoun-retention relativization\footnote{17}, seems to be controlled more or less by Keenan-Comrie hierarchy\footnote{18} and that Ross's complex NP constraint has only a limited applicability to relativization in Japanese.\footnote{19}

4.1. **Restrictive and nonrestrictive relative clauses.**

The standard position in Japanese linguistics may be represented by Kuno (1973: 235), who states:
67) Japanese has no phonological, morphological, or syntactic distinctions between restrictive and nonrestrictive relative clauses.

In evidence he gives examples like:

68) (= Kuno's (2))
   a. watakusi ni eigo o osiete-iru Mary (nonrestrictive)
      I to English teaching-is
      'Mary, who is teaching me English'
   b. watakusi ga sitte-iru Mary (restrictive)
      I knowing-is
      'the Mary that I know'.

Whether restrictive or nonrestrictive, the relative clause is placed before the head noun, and thus apparently we need only one structural source for the two, which is:

69)

```
NP
  S
```

Since ambiguity is inherent in this structure, it is yet to be seen, in any approach, how such distinction in the semantic
interpretation between the restrictive and the nonrestrictive readings is to be systematically effected.

4.2. On distinguishing restrictive clause from nonrestrictive clause.

In our grammar, since any syntactic structure that is a result of some syntactic rule is to be assigned a unique translation, the theory requires that restrictive and nonrestrictive relative clauses be syntactically different. This point was more or less taken for granted when we gave S31', p.94; note that this rule, revised below as S31, takes as the relative head noun an expression of category CN; hence no expression of category T (most typically PN) qualifies as an input argument of \( F_{29,n} \).

70) S31. (Relative Clause CN)

If \( \phi \in P_t \) and has the form \( \zeta [\text{PRO}_n.]_T \text{m} \xi \) (m = 1, 2, 3) and \( \alpha \in P_{CN} \), then \( F_{29,n}(\phi, \alpha) \in P_{CN} \), where \( F_{29,n}(\phi, \alpha) = [\zeta \xi \alpha]_{CN} \).

T31. If \( \phi \in P_t, \alpha \in P_{CN} \), and \( \phi, \alpha \) translate as \( \phi', \alpha' \) respectively, then \( F_{29,n}(\phi, \alpha) \) translates as \( \lambda x_m[\psi \& \alpha'(x_m)] \), where \( \psi \) is the result of replacing all occurrences of \( x_n \) in \( \phi' \) by occurrences of \( x_m \), where \( m \) is the least even number such that \( x_m \) has no occurrences in either \( \phi' \) or \( \alpha' \).
Thus expressions of (68) cannot be formed by this rule since Mary is a proper noun, hence of category T.

Aside from this theory requirement that restrictive and nonrestrictive relative clauses be syntactically different, there is some evidence that a uniform source for relative clauses like (69) is not enough for characterizing the syntactic structure of relative clauses. Before discussing this issue, let us first present our rule of Nonrestrictive Relative Clause Formation, which takes an expression of category t and an expression of category T and derives another expression of category T; semantically the translation effects conjoining of two clauses, which is probably no news to any of us.21

71) S32. (Nonrestrictive Relative Clause Formation)

If \( \phi \in P_t \) and has the form \( \zeta \ ([\text{PRO}_n]_T)^{-m} \xi \ (m = 1,2,3) \) and \( \alpha \in P_T \), then \( F_{30,n}(\phi,\alpha) \in P_T \), where \( F_{30,n}(\phi,\alpha) = [\zeta \xi \alpha]_T \).

T32. If \( \phi \in P_t, \alpha \in P_T \), and \( \phi, \alpha \) translate as \( \phi', \alpha' \) respectively, then \( F_{30,n}(\phi,\alpha) \) translates as \( \lambda P[\alpha'(^\lambda x_m[\psi & \forall P(x_m)])] \), where \( \psi \) is as in T31.

As an illustration of S32, I give the following abbreviated analysis tree and translation for the sample sentence below:
72) \textit{gakusei no Hanako-ga utau}

\textit{student is Hanako sing}

"Hanako, who is a student, sings."

\begin{center}
\begin{tikzpicture}
  \node {\textit{gakusei no Hanako-ga utau}}
    child {node {\textit{gakusei no Hanako}}
      child {node {\textit{PRO-ga gakusei da}}
        child {node {\textit{Hanako}}
          child {node {\textit{PRO is a student.""}}
            child {node {\textit{"Hanako"}}}}}}
      child {node {\textit{utau}}
        child {node {\textit{"sing"}}}}}
    child {node {\textit{utau}}}
  child {node {\textit{Hanako}}
    child {node {\textit{"Hanako"}}}}
\end{tikzpicture}
\end{center}

Translation:

1. \textit{PRO-ga gakusei da} $\implies$ \textit{gakusei'}($\lambda_{\exists}x_4$)

2. \textit{Hanako} $\implies$ $\lambda'Q'(h)$

3. \textit{gakusei no Hanako} $\implies$ $\lambda P[\lambda'Q'(h)(\exists \lambda x_6$

\hspace{1cm} [\textit{gakusei'}($x_6$) & $\exists P(x_6)$])]

\hspace{1cm} ;T32

4. $\implies$ $\lambda P[(\exists \lambda x_6[\textit{gakusei'}(x_6) & $\exists P(x_6)$])(h)]$ : $\lambda$-conversion

5. $\implies$ $\lambda P[\lambda x_6[\textit{gakusei'}(x_6) & $\exists P(x_6)$])(h)]$ : Down-Up

\hspace{1cm} Cancellation

6. $\implies$ $\lambda P[\textit{gakusei'}(h) & $\exists P(h)$]$ : $\lambda$-conversion

7. \textit{gakusei no Hanako-ga utau} $\implies$

\hspace{1cm} $\lambda P[\textit{gakusei'}(h) & $\exists P(h)$](\textit{\text"{utau}'}$)$

\hspace{1cm} ;T2

8. $\implies$ \textit{gakusei'}($h$) & $\exists\text{"utau'}(h)$ : $\lambda$-conversion

9. $\implies$ \textit{gakusei'}($h$) & $\text{"utau'}(h)$ : Down-Up

\hspace{1cm} Cancellation

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Thus (72) is semantically equivalent to:

73) Hanako-ga gakusei de Hanako-ga utau
    Hanako student is+and Hanako sing
    "Hanako is a student and Hanako sings."

Now I turn to the evidence that points toward the necessity of syntactically distinguishing restrictive and nonrestrictive relative clauses as we have done above.

4.2.1. Rodman's case.

Rodman (1976: 175) observes, of the following sentences:

74) (= Rodman's (34))

\[
\begin{cases}
\text{Every} \\
\text{Some} \\
\text{No} \\
\text{Any}
\end{cases}
\text{man, who is a mammal, walks.}
\]

which are judged to be all ungrammatical, that "The restriction seems to be that no term phrase that lacks a unique, identifiable referent can be modified by a nonrestrictive relative clause. The term phrases in (34) either have no referent at all or no unique one."22 Although I feel the
notion "a unique, identifiable referent" needs some further elaboration, something obviously similar is going on in Japanese, too. Observe:

75) a. *kimi-no sitteiru dareka gakusei-ga sinda
    you know some student died
    "Some student, whom you know, died."
   b. *kimi-no sitteiru daremo gakusei-ga ko-nai
       any come-not
       (lit.) "Any student, whom you know, does not come."
       "No student, whom you know, comes."

Note that the subject of these sentences consists of the sequence \([t \, \mathcal{T}]_\mathcal{T} \), that is, an output of our Nonrestrictive Relative Clause Formation S32. That these sentences are ungrammatical thus strongly suggests that whatever is responsible for the ungrammatical English sentences (74) is also responsible for (75), thereby suggesting that the sequence \([t \, \mathcal{T}]_\mathcal{T} \) represents a nonrestrictive relative clause in Japanese. Note, furthermore, that the following, unlike (75), are perfectly grammatical.

76) a. dareka kimi-no sitteiru gakusei-ga sinda
    some you know student died
    "Some student you know died."

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b. daremo kimi-no sitteiru gakusei-ga ko-nai
   any you know student come-not
(lit.) "Any student you know does not come."
"No student you know comes."

The subject of these sentences consists of the sequence \([Q [t \text{ CN}_{\text{CN}}]_T]\), that is, a combination of a Q and the output of Relative Clause CN S31, which, as you may recall, is a kind of a derived CN formation rule. Since this sequence yields a restrictive relative clause reading, a most natural conclusion to draw from the observations above is that in the case of Japanese, the sequence \([t T]_T\) corresponds to non-restrictive relative clauses while the sequence \([t \text{ CN}_{\text{CN}}]\), when further combined with some modifier like Q to form a sequence \([Q [t \text{ CN}_{\text{CN}}]_T]\), is the source for restrictive relative clauses. Without such formal distinction, the contrast between (75) and (76) is not easy to explain, or so it seems to me. We might further add that our Q-float SS4, with subsequent application of Scrambling SS5, can only float dareka or daremo in (76) to the pre-verbal position; (75) does not meet the structural description of Q-float. The Q-floated and scrambled versions of (76) are:

77) a. kimi-no sitteiru gakusei-ga dareka sinda
    b. kimi-no sitteiru gakusei-ga daremo ko-nai
As expected, these each mean (76) (a) and (b) respectively. Thus, both (76) and (77) confirm that the sequence \([t \ CN]_{CN}\) is a source for a restrictive relative clause in Japanese.

In addition to the above observations, if one did not syntactically distinguish restrictive and nonrestrictive relative clauses, there is a trivial question of how sentences like (76) are to be generated, given the uniform structure (69). If one is to say that a Q, for instance, is moved to the clause initial position if the reading assigned to the relative clause is restrictive in the following diagram:

78)

then, besides the difficulty of properly assigning a translation to this structure, such a position simply amounts to admitting a syntactic difference between restrictive and nonrestrictive relative clauses. Compared with the relative ease with which our rules can assign translations to both
restrictive and nonrestrictive relative clauses, it thus appears that the structural distinction that we posit for these is not an entirely useless one for the grammar of Japanese.

4.2.2. **Sono CN.**

Consider next a modifier like *sono* "the/that", which was alluded to in footnote 10 above. Though some other usage is possible\(^{23}\), given a sequence like:

79) a. *sono zyosei*
   \[\text{the woman}\]
   "the woman"
   b. *sono tetugakusya*
   \[\text{the philosopher}\]
   "the philosopher"

... it is most natural to take *sono* "the/that" to be a modifier that takes a CN and derives a T (cf. Chapter IV). Indeed, we also have expressions like:

80) a. *odotteiru sono zyosei*
   \[\text{is dancing the woman}\]
   "the woman, who is dancing"
b. *sono odotteiru zyosei
   the is dancing woman
   "the woman who is dancing"

where *sono "the/that" combines with the CN *zyosei "woman" in
(a) and the CN *odotteiru zyosei "woman who is dancing" in
(b) (the latter of which, as you may notice, is an output of
S31). But, as I have indicated in the gloss, (a) corresponds
to the nonrestrictive reading, while (b) corresponds to the
restrictive reading. That this is indeed the case may be
confirmed from the following mini-discourse, where the as­
terisked expression constitutes an infelicitous continuation:

81) a. kinoo henna oziisan-ni aimasita.
   "Yesterday I met a strange old man.
   yesterday strange old man met

{i. inu-o tureteita sono oziisan-wa ...
   dog was taking the old man

b. "The old man, who was walking with a dog ..."
ii. *sono inu-o tureteita oziisan-wa ...
   "The old man who was walking with a dog ... "

Since the function of a restrictive relative clause in a
conversation or discourse is to uniquely identify the refer­
ent by means of the characterization expressed in the
clause and in the head noun, it is impossible, or at least very strange, to use this construction to refer to what or who has been already uniquely identified in the same discourse. The nonrestrictive relative clause, on the other hand, has no such discourse function; rather the clause in this construction is merely an added or juxtaposed characterization that a speaker regards may be useful for his or her hearer to know about the referent of the head noun.

This difference in the discourse function manifests itself in the above type of situation, where a unique referent is introduced in the very beginning of the discourse; if an additional characterization is to be introduced later about such a uniquely identified referent by a relative clause, it must be done by means of a nonrestrictive relative clause. In other words, there is no need to re-identify such a uniquely identified individual.24 That the asterisked continuation is infelicitous thus strongly suggests that it is functioning as a restrictive relative clause in (81b) while the non-asterisked version is functioning as a non-restrictive relative clause.25 But if our rules S31 and S32 are correct, this is precisely what they predict, given that sono "the/that" is an expression that combines with a CN to derive a T. If we did not correlate the structural properties that we do in rules S31 and S32 with restrictive and nonrestrictive relative clauses, it would be difficult, it appears to me, to explain the contrast in acceptability.
between the two continuations as we see in (81) and similar cases.

4.3. **Conflation of restrictive and nonrestrictive relative clauses.**

In spite of the plausibility that (a) and (b) below are the sources for restrictive and nonrestrictive relative clauses respectively (in our Fragment of Japanese):

82) a. \[Q [t \text{CN}]_{\text{CN}}]_T; \[[t \text{CN}]_{\text{CN}}]_T
   b. \([t T]_T\)

a Q like **subete** "all" does not fit this pattern squarely. Observe, for instance:

83) a. **Hanako-wa subete-no nekutai-o siteiru dansei-to odotta**
   "Hanako danced with all men who were wearing a necktie."
   b. **Hanako-wa nekutai-o siteiru subete-no dansei-to odotta**
   i. "Hanako danced with all men who were wearing a necktie."
   ii. "Hanako danced with all men, who were wearing a necktie."
Following the patterns of (82), (a) should yield a restrictive reading, which it does, and (b) nonrestrictive. While (b) does have a nonrestrictive reading (cf. footnote 27), the dominant reading is (bi), the restrictive reading. Thus:

84) Hanako-wa nekutai-o siteiru subete-no dansei-to odotta
   Hanako  necktie is wearing all  man-with  danced
   ga nekutai-o sitei-nai dansei-to-wa odor-anakatta
   but necktie is not wearing man-with-topic dance-did not
   "Hanako danced with all men who were wearing a necktie,
   but (she) did not dance with men who were not wearing
   a necktie."

I simply do not have any even remotely plausible explanation for such apparent conflation of restrictive and nonrestrictive relative clauses. It is not simply the case that all Qs behave this way: dareka "some" or daremo "any", for instance, does not show such conflation – neither (75a) or (75b) can be understood to be restrictive relative clauses. Without any good explanation, I thus propose that this kind of case be treated by a transformation of the following sort.
85) SS11. (Q-t Swap)

X, e, Q no, t, CN, Y
1, 2, 3, 4, 5, 6 ----→
1, 4, 3, ∅ 5, 6

where 2+3+4+5 = T..

TT11. Identity mapping.

This rule converts the structure (a) below to (b).

86) a.

```
          T
           |
         Q   CN
          |
        no  t
          |
         CN
```

b.

```
          T
           |
         t   Q
          |
        no  CN
```

Since the intervening no does not appear when dareka "some(one)"

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or nanika "some(thing)" combines with a CN to form a T, SS11 does not apply when the Q is one of these indefinite Qs. It is not clear whether all Qs are subject to SS11 in Japanese, and I will leave the matter as it is. Thus, where Qs are concerned, (a) below always represents a restrictive reading, while (b) may be either nonrestrictive or restrictive (due to SS11).

87) a. \([Q \text{ no } [t \text{ CN}]]_T\]

b. \([t \text{ Q no } \text{ CN}]_T\).

4.4. Some remaining problems.

The way we have formulated our rules S31 and S32, we cannot possibly derive a restrictive reading for a relative clause with the head noun of category T (especially a PN). Thus the status of an expression like (68b) remains an open question. It is not even clear to me what kind of translation we should assign to such an expression. I do not know whether this is an inherent defect of an approach like ours, or, perhaps more likely, it is simply that we lack a good understanding about the semantic nature of T phrases, and PNs in particular. Note, for instance, that the referent of a PN like Mary or Taroo is fixed across indices in our grammar. In other words, we are saying that once you know the
referent of, say, Taroo at particular time in a particular world, you ought to be able to pick up the referent of Taroo in any capacity at any time in any world. But this is not the way we go about when we actually use a PN. Thus, in Kuno's example (68b), the referent of Mary is in some sense considered to be different from what "you" are familiar with; it is the one "I" am familiar with. Obviously then in an actual language use, a PN is used in such a way that it can have a different referent (?) depending on different indexicals. In this sense it has something in common with a CN, since the latter denotes a set of objects whose membership may differ across indices. Viewed from such an angle, the basic difference between the two seems to lie in the fact that while the denotation of a CN is a set of individuals, a PN denotes, given an indexical evaluation, a single individual. If we equate such a single individual with a set of one member, i.e., a singleton, then it seems that all that is required of a PN is that its denotation be a singleton at any index every one of which is in some sense united to constitute that something that we call, say, Taroo. But how this kind of idle reflection can be integrated into a grammar remains a puzzle for someone to solve. Carlson (1978), where he works with notions like abstract individuals and their indexical realizations, may in this respect be a promising approach though I cannot do anything more here than to point this out.
Another problem bearing on restrictive and nonrestric-
tive relative clauses that is urgently in need of solving
is the point brought up by Rodman about examples like (74)
or their counterparts in Japanese like (75). Why are these
bad? There is nothing in the way we have formulated our
Nonrestrictive Relative Clause Formation S32 that can show
that these are semantically strange or bad. If Rodman's
conjecture is correct that "no term phrase that lacks a u-
ique, identifiable referent can be modified by a nonrestric-
tive relative clause," what does it mean for a term phrase
to have "a unique, identifiable referent"? (Cf. footnote
22.) Why, for instance, is it that while English every is
not happy with the nonrestrictive relative clause (cf. (74)),
Japanese subete "all", as in (83iib), is all right? Could
this be because, even though these both relate to the total-
ity of a given set, Japanese subete "all" is an expression
that expresses or emphasizes the whole set of individuals
while English every emphasizes more the individual in the
whole set? Such contrast can be observed in paradigm cases
like the following:

88) i. English:

   a. ?Every man, who is a mammal, walks.
   b. ?Each man, who is a mammal, walks.
   c. ?Any man, who is a mammal, walks.
   d. All men, who are mammals, walk.

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ii. Japanese:

a. ?honyuurui dearu sorezore-no ningen-ga aruku
   mammal is each human walk
   (lit.) "Each man, who is a mammal, walks."

b. honyuurui dearu subete-no ningen-ga aruku
   mammal is all human walk
   "All men, who are mammals, walk."

Unless the notion "a unique, identifiable referent" can be narrowed down along this or some other line, we will not be able to characterize the strangeness of (75) or (88iia) based on Rodman's conjecture. Since we want to characterize a nonrestrictive relative clause with an indefinite bare CN head as also semantically odd or strange, some convincing explanation, whether along the line of Rodman's conjecture or something else, is urgently needed in order to block or mark as semantically ill-formed or characterize as pragmatically unacceptable sentences like (75).

5. Summary.

The main purpose of this chapter has been to show that bare CNs, or CNs that appear without any modifier in a sentence, whether basic or derived, must be treated as Ts. Semantically we seem to need two separate translations — one
corresponding to an existentially quantified CN (section 2) and one corresponding to a definite description (section 3). Though our particular proposal for generating these expressions may in the long run turn out to be ill-motivated, it appears to me that we have to have at least some kind of quantification built into the translations of both indefinite and definite bare CNs in order to explain some of the semantic facts noted in those sections. Since contextual factors seem to influence greatly the interpretations of bare CNs, it could be that rules like S29 and S30 are to be integrated as part of pragmatics (in the linguistic sense of this term). In section 4 we took up a special case of bare CNs, that is, restrictive relative clauses, and their related construction nonrestrictive relative clauses. We argued that it would be best to syntactically distinguish these two kinds of relative clauses (4.2) in spite of an apparent case of conflation of these structures (4.3) and some unresolved problems (4.4).
Footnotes to Chapter VI

1 The reason we have to have separate syntactic rules for T and CN is because their translations differ. Since each syntactic rule or the structural operation therein has to be uniquely translated, it follows we have to have different syntactic rules for Ts and bare CNs so long as their translations differ for each syntactic rule.

2 Again I am disregarding the translation for tense.

3 Recall, for instance, the feature specification approach based on the binary feature [±specific] in the transformational literature, where it was proposed, if my memory serves me right, that such a feature be assigned to a noun or a noun phrase — an approach that, from our viewpoint, seems to disregard an intensional context creating verb or construction.

4 Cf. the remark about nanika "some(thing)" in footnote 13, Chapter IV.

5 It might be well to note here that regarding an indefinite bare CN as an existentially quantified CN reveals the second reading that was suppressed from example (70), repeated below as (i), from the preceding chapter:
i) subete-no tetugakusya to ongakuka-ga kuru
   every philosopher and musician come

   (lit.) "Every philosopher and musician comes."

This sentence is actually ambiguous between the following two readings:

ii) a. Every philosopher and every musician comes.
    b. Every philosopher and a musician comes.

Note that Q-floated version of (i):

iii) tetugakusya to ongakuka-ga subete kuru
    philosopher and musician every come

only has reading (iiia) above. This should now be obvious because the way we have formulated SS4 (Q-float) and S16 (Identical Qs) there, (i) with reading (iib) never meets the "structural description" of S16, hence never feeds into SS4.

6 Unfortunately we will not discuss the conditions for definiteness; to do so would perhaps require another dissertation.

7 That is, if it is a rigid designator, the individual is invariable across indices; otherwise it may show cross-
index variation. For discussion, cf. section 4, Chapter III.

8 I remain non-committal as to the problem of gender. For a semantic treatment of pronoun genders, cf. Cooper (1975).

9 The following is an adaptation of example (35a) in Cooper (1979: 73).

10 This shows that no such paraphrase relation:

i) definite bare CN = sono CN

holds in Japanese despite the pedagogical emphasis that is placed in school grammar in Japan in translating English definite description into Japanese, where students are taught to substitute sono "the/that" for the definite article the. If we do this in the second sentence in the English translation of (53) for "the U.S. President", this will invariably mean (54) in Japanese. In general, sono CN is good as a translation of an English definite description if and only if there is referential binding between this and some preceding element. Otherwise, it appears a bare CN better serves the purpose of translating English definite descriptions. As for the usage of sono "the/that", see Kuno (1973: Chapter 24).
For the law of substitution of identicals and $\lambda$-conversion, cf. footnote 14, Chapter III.

We assume, of course, that the two sentences of (40) have the same referent point of time in the past.

According to Greg Lee (personal communication), Paul Postal discussed examples of this sort in a manuscript "Horrors of anaphora" back in '60's. One of Postal's examples that illustrates the same point was:

\begin{itemize}
  \item[i)] The alligator lost its tail, but then regrew it.
\end{itemize}

We will get a sloppy reading if, instead of the second sentence of (65), we use soo suru "do so" construction as in:

\begin{itemize}
  \item[i)] Ziroo mo soo sita
    \item Ziroo also so did
    \item "So did Ziroo."
\end{itemize}

Soo suru "do so" thus may be better regarded as a pronoun (or rather proverb) of laziness.

Though there are certain further complications, Cooper's (1979) point is that in the following discourse:
i) (= Cooper's (35a))

This year the president is a Republican. Next year he will be a Democrat.

The lazy pronoun reading of he can be derived if we give a lazy pronoun a translation that corresponds to a translation of a definite description so that a translation of the second sentence of (i) will come out as:

ii) (= Cooper's (41))

\[ W[\exists u[\forall v ([v P_0] (v) \equiv u = v)]A \text{ democrat'} (u)]. \]

This is tantamount to saying:

iii) It will be the case that the one with some property P_0 will be a Democrat.

She says, on page 75, of the above formal translation (ii) that "According to some contexts of use P_0 will denote the property of being a president and relative to such a context (41) will be true ..." She then goes on to say on the same page, "Other contexts of use will assign a different property to P_0 and we will obtain a nonanaphoric reading for the pronoun." The original motivation for this kind of treatment of lazy pronouns, it seems to me, is the fact that one can draw a parallel between a free property variable as
appears in the translation of a lazy pronoun (i.e., \(P_0\)) and a free individual variable as appears in the translation of ordinary pronouns (cf. (44) and (45) above). They both get assigned a value according to a context of use. This in a sense is an eclectic treatment which is at the same time semantic and pragmatic, but in view of the fact that pragmatic account is necessary any way at least in the case of deictic pronouns, there is no new formal mechanism added in the above treatment of lazy pronouns.

16 This is not to say that our approach is inherently inferior to the standard generative approach. So far as I know, no formally satisfactory account of these and other related topics has ever been proposed that meets syntactic and semantic adequacy.

17 Under some circumstances a pronoun may appear in the position of the relativized NP in Japanese:

i) \([[zibun\text{-}ga\ kaita]_t\ ronbun\text{-}o\ yabutta]_t\ gakusei

\([[\text{self}\quad\text{wrote}]_t\ \text{dissertation}\ \text{tore}]_t\ \text{student}

"a student who tore the dissertation he (lit. self) wrote".


Ross' complex NP constraint is:

i) (= Kuno's (20))

\[ \text{kite-iru yoohuku-ga ycgorete-iru} \text{ sinsi} \]

wearing-is suit dirty-is gentleman

"a gentleman who the suit (he) is wearing is dirty"

where the deepest embedded relative clause kite-iru "wearing-is" lacks both subject sinsi "gentleman" and object yoohuku "suit" due to relativization. On the other hand, an example like the following, which is taken from McCawley (1976: 297) with slight modification, is ungrammatical.

ii) *[[nonde-ita]_t hito-ni Taroo-ga hanasikaketa]_t nomimono

[[was drinking]_t person Taroo spoke to ]_t beverage

"the beverage which Taroo spoke to a man who was drinking".

As for the interesting correlation between themes and relative clauses that may have relevance to the acceptability of sentences like (ii), see Kuno (1973: Chapter 21).

20 The somewhat lengthy translation rule pertaining to the variable X_m is necessary to avoid collision of variables; the translation is based on that given in footnote 12 (Editor's note) to PTQ. I also assume the morphological adjustment of the form the copula da takes in the relative clause:
that is, *no* if it follows a predicate nominal CN or T, and

*na* if it is part of a nominal adjective. Cf. (72).

21Cf. Rodman (1976) about restrictive and nonrestrictive
relative clauses within the framework of MG.

22But Greg Lee (personal communication) finds a sentence
like the following perfectly grammatical:

i) No student, who would have had to have an ID to enter,
   could possibly have gotten in.

If this is so, then obviously there must be something more
going on about sentences like (74) than what it is made to
look like by Rodman's observation.

23That is, *sono* may combine with a T as in:

i) *sono sannin-no zyosei*
   
   the three woman
   "the three women".

Though there is no doubt that this usage is related to the
one we are discussing now, it is not clear how such relation
may be captured within our framework.

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For arguments along these lines, Vendler (1967: "On singular terms") is very instructive.

John Haig (personal communication) has pointed out to me that if one has a comma intonation after *sono*, (81bii) is also a good continuation. I agree with this observation. At present I do not know what to do with the effects of pause or certain intonation vis-à-vis our grammatical framework.

The point brought up in this section is also pointed out by Kamio (1976: 42). I am grateful to John Haig for bringing this paper to my attention.

For some reason that I do not understand, the non-restrictive reading is dominant if we change the tense of the relative clause to the past:

i) Hanako-wa nekutai-o siteita subete-no dansei-to odotta

Hanako necktie was wearing all man-with danced

"Hanako danced with all men, who were wearing a necktie."

Josephs (1972) discusses similar and other tense related phenomena of relative clauses in Japanese.
CHAPTER VII

THE FRAGMENT

0. Introduction.

The fragment will be presented in four sections, following the format of PTQ. Section 1 presents the syntax of Japanese. Section 2 is a presentation of a syntax and an interpretation of the intensional logic. The rules for translating the Japanese expressions into intensional logic will then be given in section 3. Section 4 is an enumeration of those meaning postulates deemed appropriate for constraining the interpretation of the translations. Conventions on variables and certain other symbols are listed in the appendix though some are overtly specified in the following sections.


Let e and t be two fixed objects that are distinct and neither ordered pairs nor ordered triples. The set of categories of Japanese CAT is to be the smallest set X such that 1) e and t are in X, and 2) whenever A and B are in X, A/B, A//B, A///B are in X.
1.0. **Basic categories.**

The set of basic phrases $B_A$ of the categories of Japa­nese are characterized as follows.

$$B_T(=t/IV) = \{ [\text{Taroo}]_{+\text{human}, \ +\text{male}, \ -\text{plural}} \text{T},
[\text{Hanako}]_{+\text{human}, +\text{female}, \ -\text{plural}} \text{T},
[\text{Kyasarin}]_{+\text{human}, \ +\text{female}, \ -\text{plural}} \text{T},$$

$$[\text{Ziroo}]_{+\text{human}, \ +\text{male}, \ -\text{plural}} \text{T},
[\text{Boo}]_{+\text{human}, +\text{female}, \ -\text{plural}} \text{T},
[\text{Misu Zyapan}]_{+\text{human}, \ +\text{female}, \ -\text{plural}} \text{T},
[\text{PRO}_n]_T \}$$

$$B_IV(=t/e) = \{ [[\text{hasir-Pres}]_V]_IV, [[\text{odor-Pres}]_V]_IV,$$
$$([\text{run}], \ "dance"),$$

$$[[\text{utaw-Pres}]_V]_IV, [[\text{sin-Pres}]_V]_IV,$$
$$("sing", \ "die"),$$

$$[[\text{waka-Pres}]_A]_IV, [[\text{ao-Pres}]_A]_IV,$$
$$("be young", \ "be blue"),$$

$$[[\text{genki} \ (\text{da-Pres})_C]_A]_IV, [[\text{sizuka} \ (\text{da-Pres})_C]_A]_IV \}$$

"be healthy", \ "be quiet"  

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\[ B_{TV}(= IV/T) = \{[\text{nagur-Pres}]_{TV}, [\text{ker-Pres}]_{TV}, \]
\begin{align*}
( & \text{"hit/slap"}, \quad \text{"kick"}, \\
& [\text{mituke-Pres}]_{TV}, [\text{seme-Pres}]_{TV}, \\
& \text{"find"}, \quad \text{"accuse"}, \\
& [\text{sagas-Pres}]_{TV}, [\text{kowa-Pres}]_{TV}, \\
& \text{"seek"}, \quad \text{"be afraid of"}, \\
& [\text{kirai} \ [\text{da-Pres}]_{A}]_{TV} \\
& \text{"hate"} \}) \]
\end{align*}

\[ B_{TTV}(= TV/T) = \{[\text{atae-Pres}]_{TTV}, [\text{syookaisu-Pres}]_{TTV} \}
\begin{align*}
( & \text{"give"}, \quad \text{"introduce"} ) \]
\end{align*}

\[ B_{CN}(= t//e) = \{[\text{dansei}]_{CN}, [\text{zyogakusei}]_{CN}, [\text{zyoyuu}]_{CN}, \\
\begin{align*}
( & \text{+human} \quad \text{+human} \quad \text{+human} \quad \text{+human}, \\
& \text{+male} \quad \text{+female} \quad \text{+female} \quad \text{+female}, \\
& \text{"man"}, \quad \text{"girl-student"}, \quad \text{"actress"}, \\
& [\text{syoonen}]_{CN}, [\text{syoozyo}]_{CN}, [\text{kappa}]_{CN}, \\
& \text{+human} \quad \text{+human} \quad \text{+human} \quad \text{+human}, \\
& \text{+male} \quad \text{+female} \quad \text{+female} \quad \text{+female}, \\
& \text{"boy"}, \quad \text{"girl"}, \quad \text{"kappa"}, \\
& [\text{heya}]_{CN}, [\text{inu}]_{CN}, [\text{hito}]_{CN}, [\text{mono}]_{CN}, \\
& \text{\text{"room"}, \quad \text{"dog"}, \quad \text{"person"}, \quad \text{"thing"}} ) \]
\end{align*}

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\[
B_{CN/CN} = \{[\text{moto}]_{CN/CN}, [\text{mirai no}]_{CN/CN}, [\text{mukasi no}]_{CN/CN}\}
\]
("former", "future", "former")

\[
B_{CN//CN} = \{[\text{yoi}]_{CN//CN}, [\text{rippa na}]_{CN//CN}\}
\]
("good", "fine")

\[
B_{Q(< T/CN)} = \{[\text{minna}]_Q, [\text{subete}]_Q, [\text{dareka}]_Q, [\text{nanika}]_Q, [\text{syosuu}]_Q, [\text{tasuu}]_Q, [\text{takusan}]_Q\}
\]
("every", "all", "some(one)", "some(thing)", "a small number of", "a large number of", "many", "n-people of")

\[
B_{IV/IV} = \{-\text{itagar-Pre}, -\text{yoo to su-Pres}\}
\]
("want (to)", "try (to)")

\[
B_{TV/IV} = \{-\text{sase}_{1}\text{-Pres}, -\text{sase}_{2}\text{-Pres}\}
\]
("cause", "cause")

\[
B_{IV//t} = \{[\text{omow-Pres}]_{IV//t}\}
\]
("think")

\[
B_{IV/t} = \{-\text{rare-Pres}\}
\]
("(Indirect Passive)"
\[ B_{\hat{T}} = (IV/TV)/T = \{ni, niyotte\} \]
((agentive) by'', (agentive) by'')

\[ B_{IV/IV} = \{[wazato]_{IV/IV}, [zibun-de]_{IV/IV}\} \]
(on purpose'', by oneself'' )

\[ B_{(IV//IV)/T} = \{de\} \]
(in/at'')

\[ B_{(T//CN)/T} = \{no\}^2 \]
(of (genitive''))

\[ B_{(IV//t)/T} = \{[[yakusokusu-Pres]_V]_{IV//t}/T, [[tikaw-Pres]_V]_{IV//t}/T\}^3 \]
("promise to (someone) that'', swear to (someone) that'')

\[ B_{TV/t} = \{[[settoku_Pres]_V]_{TV/t}, [[nozom-Pres]_V]_{TV/t}\}^3 \]
("persuade (someone) that'', desire of (someone) that'')

\[ B_A = \Lambda \text{ if } A \text{ is not one of the categories above.} \]
1.1. Syntax.

By $P_A$ is understood the set of phrases of CAT $A$. This set is introduced by the following rules. Parentheses, except when used to indicate the arguments of a syntactic operation, indicate optionality in description of form. Auxiliary syntactic notions as discussed in the preceding chapters are assumed. Certain syntactic operations recur, two of which we give special names, which are:

\[ \text{STRIP}(\alpha) = \beta, \text{ where } \alpha = [\beta]_A \text{ for any category } A. \]

\[ \text{REPLACE}(\alpha, \beta) \text{ is the result of replacing the main verb tense } -\text{Pres} \text{ in } \beta \text{ by } \alpha. \]

We add a mnemonic name after each rule number in parentheses.

S1. (Lexicon)

$B_A \subseteq P_A$ for every category $A$.

S2. (Subject-Verb)

i. If $\alpha \in P_T$ and has the form $[\text{PRO}_n]_T \ (n \geq 0)$, $\beta \in P_{IV}$, then $F_0(\alpha, \beta) \in P_T$, where $F_0(\alpha, \beta) = [[\alpha -]_1 \text{ STRIP}(\beta')]_T$, where $\beta'$ is the result of replacing every occurrence of $[\text{PRO}_n]_T \ (n \geq 0)$ in $\beta$ by $[\text{zibun}_n]_T$. 

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ii. If $\alpha \in P_T$ and does not have the form $[\text{PRO}_n]_T$ ($n \geq 0$), $\beta \in P_{IV}$, then $F_1(\alpha, \beta) \in P_t$, where $F_1(\alpha, \beta) = [[\alpha \ -_1 \ \text{STRIP}(\beta)]]_t$.

S3. (DO-Verb)

If $\alpha \in P_T$, $\beta \in P_{TV}$, then $F_2(\alpha, \beta) \in P_{IV}$, where $F_2(\alpha, \beta) = [[\alpha \ -_2 \ \text{STRIP}(\beta)]]_{IV}$.

S4. (IO-Verb)

If $\alpha \in P_T$, $\beta \in P_{TTV}$, then $F_3(\alpha, \beta) \in P_{TV}$, where $F_3(\alpha, \beta) = [[\alpha \ -_3 \ \text{STRIP}(\beta)]]_{TV}$.

S5. (Predicate Nominal T)

If $\alpha \in P_T$, then $F_4(\alpha) \in P_{IV}$, where $F_4(\alpha) = [\alpha \ [\text{da-Pres}]]_{IV}$.

S6. (Predicate Nominal CN)

If $\alpha \in P_{CN}$, then $F_4(\alpha) \in P_{IV}$.

S7. (Derived CN)

If $\alpha \in P_{CN/CN}$ or $P_{CN//CN}$, $\beta \in P_{CN}$, then $F_5(\alpha, \beta) \in P_{CN}$, where $F_5(\alpha, \beta) = [\alpha \ \beta]_{CN}$.

S8. (Q-CN)

i. If $\alpha \in P_Q$ and does not have the form $[\text{dareka}]_Q$ or $[\text{nankika}]_Q$, $\beta \in P_{CN}$, then $F_6(\alpha, \beta) \in P_T$, where $F_6(\alpha, \beta) = [\alpha \ \text{no} \ \beta]_T$. 

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ii. If $\alpha = \text{[dareka -plural]}_Q$ or $\text{[nanika -plural]}_Q$, \( \beta \in P_{CN} \), then

$$F_7(\alpha, \beta) \in P_T,$$

where $F_7(\alpha, \beta) = [\alpha \beta]_T$.

S9. (Quantification)

If $\alpha \in P_T$ and $\alpha \neq [\text{PRO}_m]_T$, $\phi \in P_t$ and $\phi$ contains an occurrence of $[\text{PRO}_n]_T$, then $F_8, n(\alpha, \phi) \in P_T$, where $F_8, n(\alpha, \phi)$ comes from $\phi$ by replacing the first occurrence of $[\text{PRO}_n]_T$ by $\alpha$ and all the other occurrences of $[\text{PRO}_n]_T$ by $[\text{PRO}]_T$, where $\gamma$ is a feature specification of $\alpha$.

S10. (t-conjunction)

i. If $\phi, \psi \in P_t$, then $F_9(\phi, \psi) \in P_T$, where $F_9(\phi, \psi) = [\phi \text{ si } \psi]_T$.

ii. If $\phi, \psi \in P_t$ and are of the same tense, then

$$F_{10}(\phi, \psi) \in P_T,$$

where $F_{10}(\phi, \psi) = [\text{REPLACE(-te,} \phi) \psi]_T$.

S11. (t-disjunction)

If $\phi, \psi \in P_t$, then $F_{13}(\phi, \psi) \in P_T$, where $F_{13}(\phi, \psi) = [\phi \text{ ka } \psi]_T$.

S12. (IV-conjunction)

If $\alpha, \beta \in P_{IV}$, then $F_{11}(\alpha, \beta) \in P_{IV_T}$, where $F_{11}(\alpha, \beta) = [\text{REPLACE(-te,} \alpha) \beta]_{IV}$.
S13. (IV-disjunction)

If $\alpha, \beta \in P_{IV}$, then $F_{14}(\alpha, \beta) \in P_{IV}$, where $F_{14}(\alpha, \beta) = [\alpha \text{ ka } \beta]_{IV}$.

S14. (T-conjunction)

If $\alpha, \beta \in P_{T}$, then $F_{12}(\alpha, \beta) \in P_{T}$, where $F_{12}(\alpha, \beta) = [\alpha \text{ to } \beta]_{T}$.

S15. (T-disjunction)

If $\alpha, \beta \in P_{T}$, then $F_{15}(\alpha, \beta) \in P_{T}$, where $F_{15}(\alpha, \beta) = [\alpha \text{ ka } \beta]_{T}$.

S16. (Identical Qs)

If $\xi \in P_{T}$ and has the form $[[\alpha] Q \ (\text{no}) \ [\beta]_{CN}]_{T}$ to $[[\alpha] Q \ (\text{no}) \ [\gamma]_{CN}]_{T}$, where $[\alpha] Q$ is not a numeric expression $Q$, then $F_{16}(\xi) \in P_{T}$, where $F_{16}(\xi) = [[\alpha] Q \ (\text{no}) \ [\beta]_{CN} \ \text{to} \ [\gamma]_{CN}]_{T}$.

S17. (TV-conjunction)

If $\alpha, \beta \in P_{TV}$, then $F_{35}(\alpha, \beta) \in P_{TV}$, where $F_{35}(\alpha, \beta) = \text{REPLACE}(-\text{te}, \alpha \ beta)_{TV}$.

S18. (Derived IV)

If $\phi \in P_{T}$ and has the form $[[\text{PRO}_{n}]_{T} \ -]_{1} \delta]_{T}$, then $F_{17,n}(\phi) \in P_{IV}$, where $F_{17,n}(\phi) = [\delta]_{IV}$.
S19. (TV-disjunction)
If \( \alpha, \beta \in P_{TV} \), then \( F_{36}(\alpha, \beta) \in P_{TV} \), where \( F_{36}(\alpha, \beta) = [\alpha \text{ ka } \beta]_{TV} \).

S20. (Negation)
If \( \phi \in P_t \) and does not contain any coordinate node, then \( F_{19}(\phi) \in P_t \), where \( F_{19}(\phi) \) is i) REPLACE(-ana-Pres,\( \phi \)) if \( \phi \) contains no occurrence of an indefinite Q, and ii) if \( \phi \) contains an occurrence of an indefinite Q, the result of replacing every such occurrence of an indefinite Q by its negative form in REPLACE(-ana-Pres,\( \phi \)).

S21. (Subject-Equi)
If \( \alpha \in P_{IV/IV} \), \( \beta \in P_{IV} \) and \( \beta \) has a verb as its main verb (i.e., neither adjectival nor copulative), then \( F_{20}(\alpha, \beta) \in P_{IV} \), where \( F_{20}(\alpha, \beta) = \text{REPLACE}(\alpha, \beta) \).

S22. (Causative or Object-Equi)
If \( \alpha \in P_{TV/IV} \), \( \beta \in P_{IV} \), then \( F_{37}(\alpha, \beta) \in P_{TV} \), where \( F_{37}(\alpha, \beta) = [\text{STRIP}(\text{REPLACE}(\alpha, \beta))]_{TV} \).

S23. (Indirect Passive)
If \( \alpha \in P_{IV/t} \), \( \phi \in P_t \) and \( \phi \) has a verb as its main verb and has the form \([- \beta]_t \delta \)\( \text{t} \), then \( F_{21}(\alpha, \phi) \in P_{IV} \), where \( F_{21}(\alpha, \phi) = [[\beta \text{ ni}] \text{t} \text{ REPL} \text{ACE}(\alpha, \delta)]_{IV} \).
S24. (Agentive ni)

If \( \alpha \in P_T, \beta \in B_{1/T}, \) then \( F_{22}(\alpha, \beta) \in P_{1} \), where \( F_{22}(\alpha, \beta) = [\alpha \beta]_{1} \).

S25. (Direct Passive)

If \( \alpha \in P_{1}, \delta \in P_{TV} \) or \( P_{DTV} \) and \( \delta \) is a nonadjectival transitive, then \( F_{23}(\alpha, \delta) \in P_{IV}, \) where \( F_{23}(\alpha, \delta) = [\alpha \text{STRIP(REPLACE(-rare-Pres,\delta))}]_{IV} \).

S26. (IV-adverbial)

If \( \alpha \in P_{IV}/_{//IV}, \delta \in P_{IV}, \) then \( F_{24}(\alpha, \delta) \in P_{IV}, \) where \( F_{24}(\alpha, \delta) = [\alpha \text{STRIP}(\delta)]_{IV} \).

S27. (Locative)

If \( \alpha \in P_{(IV)//IV}/T, \beta \in P_T, \) then \( F_{25}(\alpha, \beta) \in P_{IV}///IV, \) where \( F_{25}(\alpha, \beta) = [\beta \alpha]_{IV//IV} \).

S28. (Dative TV)

If \( \delta \in P_{TTV}, \alpha \in P_T, \) then \( F_{26}(\alpha, \delta) \in P_{DTV}, \) where \( F_{26}(\alpha, \delta) = [[\alpha \_2 \_1 \_2 \text{STRIP}(\delta)]_{DTV} \).

S29. (Indefinite Bare CN)

If \( \alpha \in P_{CN}, \) then \( F_{27}(\alpha) \in P_T, \) where \( F_{27}(\alpha) = [\alpha]_T \).

S30. (Definite Bare CN)

If \( \alpha \in P_{CN}, \) then \( F_{28}(\alpha) \in P_T, \) where \( F_{28}(\alpha) = [\alpha]_T \).
S31. (Relative Clause CN)
If $\phi \in P_t$ and has the form $\zeta [[\text{PRO}_{n}T^{-}]_{m}} \xi$ (m = 1, 2, 3) and $\alpha \in P_{CN}$, then $F_{29,n}(\phi, \alpha) \in P_{CN}$, where $F_{29,n}(\phi, \alpha) = [\zeta \xi \alpha]_{CN}$.

S32. (Nonrestrictive Relative Clause T)
If $\phi \in P_t$ and has the form $\zeta [[\text{PRO}_{n}T^{-}]_{m}} \xi$ (m = 1, 2, 3) and $\alpha \in P_{T}$, then $F_{30,n}(\phi, \alpha) \in P_{T}$, where $F_{30,n}(\phi, \alpha) = [\zeta \xi \alpha]_{T}$.

S33. (Genitive no)
If $\alpha \in P_{(T///CN)/T'}$, $\beta \in P_{T}$, then $F_{31}(\alpha, \beta) \in P_{T///CN}$, where $F_{31}(\alpha, \beta) = [\beta \alpha]_{T///CN}$.

S34. (Past Tense)
If $\phi \in P_t$ and $\phi$ does not have the form $[[\psi]_{T} \text{ si} [\omega]_{t}]_{t}$ or $[[\psi]_{T} \text{ ka} [\omega]_{t}]_{t}$, then $F_{32}(\phi) \in P_t$, where $F_{32}(\phi) = \text{REPLACE}(-\text{Past}, \phi)$.

S35. (Optional Subject-Equi)$^3$
If $\alpha \in P_{T'}$, $\delta \in P_{(IV///t)T}$, then $F_{33}(\alpha, \delta) \in P_{IV///t}$, where $F_{33}(\alpha, \delta) = [[\alpha \text{ ni}]_{3} \delta]_{IV///t}$.

S36. (Optional Object-Equi)$^3$
If $\phi \in P_{t'}$, $\delta \in P_{TV/t}$, then $F_{34}(\phi, \delta) \in P_{TV}$, where $F_{34}(\phi, \delta) = [\phi-\text{yoo ni} \delta]_{TV}$.
S37. (IV//t Complement)

If $\phi \in P_{t}$, $\delta \in P_{IV//t}$ or $P_{IV//t}$, then $F_{38}(\phi, \delta) \in P_{IV}$,
where $F_{38}(\phi, \delta) = [\phi \to \delta]_{IV}$.

S38. (Derived T)

If $\alpha \in P_{T//CN}$, $\beta \in P_{CN}$, then $F_{7}(\alpha, \beta) \in P_{T}$.

Transformations: All transformations are optional and apply on the t cycle.

SS1. (Predicate Nominal CN Shift)

T, -, CN, C

1, 2, 3, 4 ----> 3, 2, 1, 4

SS2. (hito-deletion)

X, Q, (no) hito, Y

1, 2, 3, 4 -----> 1, 2, 0, 4

where i) no $\neq (T//CN)/T$, and

ii) Q = minna or dareka.
SS3. (mono-deletion)

\[ X, Q, (\text{no}) \text{ mono}, Y \]

\[ 1, 2, 3, 4 \quad \rightarrow \]

\[ 1, 2, \emptyset, 4 \]

where i) no \( \neq (T//CN)/T \), and

ii) \( Q = \text{subete or nanika} \).

SS4. (Q-float)

\[ X, e, Q, (\text{no}), \text{CN}, \left\{ \begin{array}{l} g \alpha \\ o \end{array} \right\} Y \]

\[ 1, 2, 3, 4, 5, 6 \quad \rightarrow \]

\[ 1, 3, \emptyset, \emptyset, 5, 6 \]

where i) no \( \neq (T//CN)/T \), and

ii) \( 3+4+5 = T \).

SS5. (Scrambling)

\[ X, A, B, Y \left\{ \begin{array}{l} V \\ A \\ \text{CN} \\ T \end{array} \right\} \]

\[ 1, 2, 3, 4 \quad \rightarrow \]

\[ 1, 3, 2, 4 \]

where i) \( t \) directly dominates \( A \) and \( B \),

and

ii) if \( A \) (or \( B \)) is \( Q \), then \( B \) (or \( A \))

may not contain any \( Q \), nor is

there any \( Q \) in \( Y \) (or \( X \)) directly dominated by \( t \).

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SS6. (Q-CN Interchange)
\[X, Q, \text{no}, CN, Y\]
\[1, 2, 3, 4, 5 \longrightarrow 1, 4, \emptyset, 2, 5\]
where no \(\neq (T/\text{CN})/T\).

SS7. (Right Conjunct Identical Node PRO Deletion)
\[X, \text{PRO}_n -, Y, (\text{si} \quad \text{ka}), W, \text{PRO}_n -, Z\]
\[1, 2, 3, 4, 5, 6, 7 \longrightarrow 1, 2, 3, 4, 5, [\emptyset], 7\]
where i) 1+2+3 and 5+6+7 are coordinate nodes, and
ii) 2 and 6 are each dominated directly by \(m (m = 1, 2, 3)\).

SS8. (Conjunction Particle Insertion)
\[X, T, A, T, B, Y\]
\[1, 2, 3, 4 \longrightarrow 1, 2, 3, 2, 4\]
where i) A = to or ka, and
ii) B \in \{ga, o, ni, niotte, e\}

SS9. (Copula Complementation)
\[t\]
\[1 \longrightarrow 1 \# \text{no} \quad \text{[da-Pres]}\]
where 1 does not dominate any \(\text{PRO}_n\).
SS10. (Agent Deletion)

\[
X, \text{ PRO}_n \text{ niyotte}, Y
\]

\[
1, \quad 2 , \quad 3 \quad \rightarrow
\]

\[
1, \quad \emptyset , \quad 3
\]

SS11. (Q-t Swap)

\[
X, e, Q \text{ no}, t, \text{ CN}, Y
\]

\[
1, 2, 3, 4, 5, 6 \quad \rightarrow
\]

\[
1, 3, 4, \quad \emptyset , \quad 5, \quad 6
\]

where \(2+3+4+5 = T\).

SS12. (Raising)\(^6\)

If \(\phi \in P_t\) and has the form \([\alpha]_1 [\beta \gamma]_t \to [\delta]_{IV//t}^t\),

where \(\gamma\) is analyzable as \(X\{ \text{ A } \}_t \)

then \(F_{12'}(\phi) \in P_t\), where

\[
F_{12'}(\phi) = [\alpha]_1 [\beta \gamma]_2 [\gamma]_t \to [\delta]_{IV//t}^t.
\]

SS13. (Equi-NP Deletion)\(^3\)

i. \(X, \text{ PRO}_n \text{-, PRO}_n \text{-, Y-yoo ni, TV/t}\)

\[
1, \quad 2 , \quad 3 , \quad 4 , \quad 5 \quad \rightarrow
\]

\[
1, \quad 2 , \quad \emptyset , \quad 4 , \quad 5
\]

where i) \(3+4 = t, \quad 3 = 1\) (Subject),

and

ii) \(2 = 2\) (Direct Object).
ii. \textit{PRO}_n \rightarrow X, \textit{zibun}_n \rightarrow Y \text{-to}, (IV//t)/T

\begin{align*}
1, 2, & \quad 3, 4, \quad 5 \quad \rightarrow \\
1, 2, & \quad \emptyset, \quad 4, \quad 5
\end{align*}

where i) $3 = 1$ (Subject), and

\[ \text{ii) } 3 + 4 = t. \]

2. \textbf{Intensional logic.}

In this section we present a syntax and an interpretation of intensional logic. We follow Montague's presentation of intensional logic almost exactly except for a few additions necessary to account for cases involving numeric Qs, relative size Qs and causation.\footnote{\textsuperscript{7}}

2.0. \textbf{Syntax of intensional logic.}

Corresponding to the syntactic categories of Japanese, we have the types of intensional logic. Let $s$ be a fixed object distinct from $e$ and $t$ and not an ordered pair or triple. The \textit{TYPE}, or the set of \textit{types of intensional logic}, is to be the smallest set $Y$ such that 1) $e, t \in Y$, 2) whenever $a, b \in Y$, $<a,b> \in Y$, and 3) whenever $a \in Y$, $<s,a> \in Y$. 

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The letters of the intensional logic are: [ ], ( ), ~, &,, v, \rightarrow, \leftrightarrow, ~@, \forall, ], T, S, =, K, \square, \mathcal{B}, \mathcal{W}, \lambda, \lor, \exists, \neg, numerals 0,1,\ldots,9, numerical superscripts 0,1,\ldots,9, together with the symbols \(v_n, a\) and the sets of symbols \(\text{CON}_a\) for each nonnegative integer \(n\) and each \(a \in \text{TYPE}\). We understand by \(v_n, a\) the \(n\)th variable of type \(a\), and by \(\text{CON}_a\) the set of constants of type \(a\). Thus the vocabulary of intensional logic contains for each type \(a\) a denumerably infinite number of variables and infinitely many constants. An expression of intensional logic is any finite concatenation of the letters of intensional logic.

By \(\text{ME}_a\) is understood the set of meaningful expressions of type \(a\); this notion is characterized by the following recursive definition.

(1) If \(\alpha \in \text{VAR}_a \cup \text{CON}_a\), then \(\alpha \in \text{ME}_a\).

(2) If \(\alpha \in \text{ME}_a\) and \(u \in \text{VAR}_b\), then \(\lambda u \alpha \in \text{ME}_{<b,a>}\).

(3) If \(\alpha \in \text{ME}_{<a,b>}\) and \(\beta \in \text{ME}_a\), then \(\alpha(\beta) \in \text{ME}_b\).

(4) If \(\alpha, \beta \in \text{ME}_a\), then \(\alpha = \beta \in \text{ME}_a\).

(5) If \(\phi, \psi \in \text{ME}_a\) and \(u \in \text{VAR}\), then \(\neg \phi, [\phi \wedge \psi], [\phi \vee \psi],
\[\phi \rightarrow \psi], [\phi \leftrightarrow \psi], (\forall u)\phi, (\exists u)\phi, (\exists u)\phi,
(T^n u)\phi, (S^n u)\phi, \dot{\lambda} \phi, \square \phi, \mathcal{B} \phi, \mathcal{W} \phi \in \text{ME}_a\).

(6) If \(\alpha \in \text{ME}_a\), then \([\hat{\alpha}] \in \text{ME}_{<s,a>}\).

(7) If \(\alpha \in \text{ME}_{<s,a>}\), then \([\hat{\alpha}] \in \text{ME}_a\).

(8) Nothing is in a set \(\text{ME}_a\) except as required by (1)-(7).
By a meaningful expression of intensional logic is understood a member of $\bigcup_{a \in \text{TYPE}} \text{ME}_a$.

The symbols $\neg$, $\&$, $\lor$, $\rightarrow$, $\leftrightarrow$, $\forall$, $\exists$, $=$ are to be understood in the usual way. The symbol $\rightarrow^\ast$ may be read "causes"; the symbols $K$, $\Box$, $\square$, $\square$ may be read "it has been the case that", "it is necessarily always the case that", "it is always the case that", "it is necessarily the case that" respectively. If $u$ is a variable of type $a$, then $\lambda u \alpha$ is to be understood as denoting that function from objects of type $a$ which takes as value, for any such object $x$, the object denoted by $\alpha$ when $u$ is understood as denoting $x$. The expression $\alpha(\beta)$ is to be understood as denoting the value of the function denoted by $\alpha$ for the argument denoted by $\beta$. If $\alpha \in \text{ME}_a$, then the expression $[^\alpha]$ is regarded as denoting the object of type $<s,a>$ which is the intension of $\alpha$. If $\alpha \in \text{ME}_{<s,a>}$, then the expression $[^\alpha]$ is regarded as denoting the corresponding extension, which is an object of type $a$.

When writing expressions of intensional logic, brackets may be freely omitted or gratuitously inserted for perspicuity in the actual presentation.
2.1. Interpretation of intensional logic.

Let $A$, $I$, $J$ be any sets, which are to be regarded for our purpose as the set of possible individuals, the set of possible worlds, and the set of moments of time respectively. By $X^Y$ is to be understood the set of all functions with domain $Y$ and range included in $X$; and by $X \times Y$ is understood the Cartesian product of $X$ and $Y$, that is, the set of all ordered pairs $<x, y>$ such that $x \in X$, $y \in Y$. Further we identify the truth values falsehood and truth with the numbers 0 and 1 respectively.

$D_{a,A,I,J}$, or the set of possible denotations of type $a$ corresponding to $A, I, J$ is characterized by the following recursive definition.

\[
\begin{align*}
D_{e,A,I,J} &= \{0, 1\} \\
D_{t,A,I,J} &= A \\
D_{<a,b>,A,I,J} &= D_{b,A,I,J} D_{a,A,I,J} \\
D_{<s,a>,A,I,J} &= D_{a,A,I,J} I \times J
\end{align*}
\]

By an interpretation of intensional logic (or intensional model) is understood a quintuple $<A, I, J, \preceq, F>$ such that 1) $A, I, J$ are non-empty sets, 2) $\preceq$ is a linear ordering imposed on $J$, 3) $F$ is a function having as its domain the set of all constants,
or $\cup a \in \text{TYPE} \cap \text{CON}_a$, and 4) whenever $a \in \text{TYPE}$, $a \in \text{CON}_a$, $F(a) \in D_{s,a}, A, I, J$.

Let $\mathfrak{A}$ be an interpretation that has the form $<A, I, J, \leq, F>$. Also let $g$ be an $\mathfrak{A}$-assignment of values to variables such that whenever $u \in \text{VAR}_a$, $g(u) \in D_{a, A, I, J}$. Suppose further that $f(\phi, i) \in I$ whenever $\phi \in \text{ME}_a$ and $i \in I$; intuitively $f(\phi, i)$ selects that $i'$ such that $i' \in I$ and $i'$ is most like $i$ with the possible exception that $\phi$ is the case. Further let $h$ be a plurality assignment, which is a function from nonnegative integers to a set of 2-place sequences of nonnegative integers $<h(n)(0), h(n)(1)>$ such that $2 \leq h(n)(0)$ and $h(n)(0) < h(n)(1)$; intuitively, $h$ associates with each occurrence of a relative size $Q$ a sequence of nonnegative integers that specifies what constitutes $\text{tasuu}$ "a large number of", $\text{syoosuu}$ "a small number of", etc. for the occasion designated by $n$. Let, furthermore, $k$ be a function such that whenever $\alpha \in \text{ME}_{a, \tau}$, $k(\alpha)$ yields the cardinal, a nonnegative integer, of the set corresponding to $\alpha$.

By a point of reference is to be understood an ordered pair $<i, j> \in I \times J$. If $\alpha \in \text{ME}_a$, then $\mathfrak{A}, i, j, g, h$ is the extension of $\alpha$ with respect to an interpretation $\mathfrak{A}$, a point of reference $<i, j>$, an $\mathfrak{A}$-assignment (of values to variables) $g$, and a plurality assignment $h$. This notion is characterized by the following recursive definition.
(1) If $\alpha \in \text{CON}_a$, then $\alpha^{\otimes,i,j,g,h}$ is $F(\alpha)(<i,j>)$.

(2) If $\alpha \in \text{VAR}_a$, then $\alpha^{\otimes,i,j,g,h}$ is $g(\alpha)$.

(3) If $\alpha \in \text{ME}_a$, and $u \in \text{VAR}_b$, then $[\lambda u]^{\otimes,i,j,g,h}$ is that function $h'$ with domain $D_{b,A,I,J}$ such that whenever $x$ is in that domain, $h'(x)$ is $\alpha^{\otimes,i,j,g',h}$, where $g'$ is the $A$-assignment like $g$ except for the possible difference that $g'(u) = x$.

(4) If $\alpha \in \text{ME}_{<a,b>}$ and $\beta \in \text{ME}_a$, then $[\alpha(\beta)]^{\otimes,i,j,g,h}$ is $\alpha^{\otimes,i,j,g,h}/\beta^{\otimes,i,j,g,h}$ (that is, the value of the function $\alpha^{\otimes,i,j,g,h}$ for the argument $\beta^{\otimes,i,j,g,h}$).

(5) If $\phi \in \text{MET}$, then $[\neg]\theta^{\otimes,i,j,g,h}$ is 1 if and only if $\theta^{\otimes,i,j,g,h}$ is 0; and similarly for $\land$, $\lor$, $\rightarrow$, $\leftrightarrow$.

(6) If $\phi$, $\psi \in \text{MET}$, then $[\phi \rightarrow \psi]^{\otimes,i,j,g,h}$ is 1 if and only if $[\phi \land \psi]^{\otimes,i,j,g,h}$ is 1 and $[\neg \psi]^{\otimes,i,j,g,h}$ is 1.

(7) If $\phi \in \text{MET}$ and $u \in \text{VAR}_a$, then $[(\exists u)\phi]^{\otimes,i,j,g,h}$ is 1 if and only if there exists $x \in D_{a,A,I,J}$ such that $\phi^{\otimes,i,j,g',h}$ is 1, where $g'$ is as in (3); and similarly for $(\forall u)\phi$.

(8) If $\phi \in \text{MET}$, $u \in \text{VAR}_a$, and $n$ is a nonnegative integer, then $[(\exists n)u]\phi^{\otimes,i,j,g,h}$ is 1 if and only if $k([\lambda u]^{\otimes,i,j,g,h}) = n$.

(9) If $\phi \in \text{MET}$, $u \in \text{VAR}_a$, and $n$ is a nonnegative integer, then $[(\exists n)u]\phi^{\otimes,i,j,g,h}$ is 1 if and only if $k([\lambda u]^{\otimes,i,j,g,h}) \geq h(n)(1)$.

(10) If $\phi \in \text{MET}$, $u \in \text{VAR}_a$, and $n$ is a nonnegative integer, then $[(S^n)u]\phi^{\otimes,i,j,g,h}$ is 1 if and only if $k([\lambda u]^{\otimes,i,j,g,h}) \leq h(n)(0)$. 

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(11) If \( \phi \in \text{ME}_t \), then \([K\phi]_{\mathfrak{A},i,j,g,h} \) is 1 if and only if \( \phi_{\mathfrak{A},i,j',g,h} \) is 1 for some \( j' \) such that \( j' < j \); 
\([\square \phi]_{\mathfrak{A},i,j,g,h} \) is 1 if and only if \( \phi_{\mathfrak{A},i',j',g,h} \) is 1 for all \( i' \in I \) and \( j' \in J \); 
\([\bigcirc \phi]_{\mathfrak{A},i,j,g,h} \) is 1 if and only if \( \phi_{\mathfrak{A}',i,j,g,h} \) is 1 for all \( j' \in J \); 
\([\text{ml} \phi]_{\mathfrak{A},i,j,g,h} \) is 1 if and only if \( \phi_{\mathfrak{A}',i',j,g,h} \) is 1 for all \( i' \in I \).

(12) If \( \alpha, \beta \in \text{ME}_a \), then \([\alpha = \beta]_{\mathfrak{A},i,j,g,h} \) is 1 if and only if \( \alpha_{\mathfrak{A},i,j,g,h} = \beta_{\mathfrak{A},i,j,g,h} \).

(13) If \( \alpha \in \text{ME}_a \), then \([\wedge \alpha]_{\mathfrak{A},i,j,g,h} \) is that function \( h' \) with domain \( I \times J \) such that whenever \( <i,j> \in I \times J \), \( h'(<i,j>) = \alpha_{\mathfrak{A},i,j,g,h} \).

(14) If \( \alpha \in \text{ME}_{<s,a>} \), then \([\forall \alpha]_{\mathfrak{A},i,j,g,h} \) is \( \alpha_{\mathfrak{A},i,j,g,h}(<i,j>) \).

If \( \phi \in \text{ME}_t \), then \( \phi \) is true with respect to \( \mathfrak{A},i,j,h \) if and only if \( \phi_{\mathfrak{A},i,j,g,h} \) is 1 for every \( \mathfrak{A} \)-assignment \( g \).

3. Translating Japanese into intensional logic.

We first introduce a mapping from the categories of Japanese to the types of intensional logic. Thus, \( f \) is to be a function with \( \text{CAT} \) as its domain such that:

\[
\begin{align*}
\text{f}(t) &= t. \\
\text{f}(\text{IV}) &= \text{f}(\text{CN}) = <e,t>. \\
\text{f}(A/B) &= \text{f}(A/B) = F(A//B) = <<s,f(B),f(A)> > \text{ whenever } A, B \in \text{CAT}.
\end{align*}
\]
The actual translation into the intensional logic is to be accomplished by a fixed biunique function \( g \) from the basic expressions of the categories of Japanese to expressions of the intensional logic; not all of the translations, however, are into constants of the logic, but rather into complex expressions. The rules of translation for the syntactic rules are as follows. 8

1. a. Taro, Hanako, Kyasarin, Ziroo, Boo, Misu Zyapan translate as \( \lambda P \forall P(\alpha) \), where \( \alpha \) is t,h,k,z,b,m respectively.
   b. PRO translates as \( \lambda P \forall P(x_n) \).
   c. minna, subete translate as \( \lambda P \exists Q(\forall x) [\forall P(x) \rightarrow \forall Q(x)] \).
   d. dareka translates as \( \lambda P \exists Q(\exists x)[\text{hito}'(x) \& [\forall P(x) \& \forall Q(x)]] \).
   e. nanika translates as \( \lambda P \exists Q(\exists x)[\text{mono}'(x) \& [\forall P(x) \& \forall Q(x)]] \).
   f. takusan, tasuu translates as \( \lambda P \exists Q(\exists x)[\forall P(x) \& \forall Q(x)] \).
   g. syoosuu translates as \( \lambda P \exists Q(\exists x)[\forall P(x) \& \forall Q(x)] \).
   h. n-nin translates as \( \lambda P \exists Q(\exists x)[\forall P(x) \& \forall Q(x)] \).
   i. -sase_1-Pres translates as
      \( \lambda P \forall x \exists x \exists P \exists \lambda x \text{saseru'}(x, \forall P(x) \& \exists \lambda x P(x)) \).
   j. -sase_2-Pres translates as \( \lambda P \forall x \exists x \exists P \exists \lambda x \text{saseru'}(x, \forall P(x)) \).
   k. ni, niyotte translates as
      \( \lambda P \forall x \forall y \forall \lambda x \forall P(\forall \lambda y \forall P(y, \forall P(x))) \).
1. \( \text{no} \) translates as \( \lambda x \lambda y \lambda Q(x)[(\forall y)[\forall P(y) \& \exists \{\forall w R(w, y)\}] \leftrightarrow x = y] \& \forall Q(x)]. \)

m. Any expression of a basic category of Japanese not above is in the domain of \( g \) such that if \( \alpha \) is in its domain, \( \alpha \) translates as \( g(\alpha) \).

T2. If \( \alpha \in P_T, \beta \in P_{TV} \), and \( \alpha, \beta \) translate as \( \alpha', \beta' \) respectively, \( F_0(\alpha, \beta), F_1(\alpha, \beta) \) translate as \( \alpha'(\beta') \).

T3. If \( \alpha \in P_T, \beta \in P_{TV} \), and \( \alpha, \beta \) translate as \( \alpha', \beta' \) respectively, then \( F_2(\alpha, \beta) \) translates as \( \beta'(\alpha') \).

T4. If \( \alpha \in P_T, \beta \in P_{TTV} \), and \( \alpha, \beta \) translate as \( \alpha', \beta' \) respectively, then \( F_3(\alpha, \beta) \) translates as \( \beta'(\alpha') \).

T5. If \( \alpha \in P_T \), and \( \alpha \) translates as \( \alpha' \), then \( F_4(\alpha) \) translates as \( \lambda x \lambda y \lambda P(\alpha'(\alpha')) \).

T6. If \( \alpha \in P_{CN} \), and \( \alpha \) translates as \( \alpha' \), then \( F_4(\alpha) \) translates as \( \alpha' \).

T7. If \( \alpha \in P_{CN/CN} \) or \( P_{CN/CN} \), \( \beta \in P_{CN} \), and \( \alpha, \beta \) translate as \( \alpha', \beta' \) respectively, then \( F_5(\alpha, \beta) \) translates as \( \alpha'(\beta') \).

T8. If \( \alpha \in P_Q, \beta \in P_{CN} \), and \( \alpha, \beta \) translate as \( \alpha', \beta' \) respectively, then \( F_6(\alpha, \beta), F_7(\alpha, \beta) \) translate as \( \alpha'(\beta') \).
T9. If $\alpha, \phi \in \mathbb{P_T}$, $\phi \in \mathbb{P_t}$, and $\alpha, \phi$ translate as $\alpha', \phi'$ respectively, then $F_{9,9}^{\alpha, \phi}$ translates as $\alpha'(\lambda x_n \phi')$.

T10. If $\phi, \psi \in \mathbb{P_t}$ and translate as $\phi', \psi'$ respectively, then $F_9(\phi, \psi), F_{10}(\phi, \psi)$ translate as $\phi' \& \psi'$.

T11. If $\phi, \psi \in \mathbb{P_t}$ and translate as $\phi', \psi'$ respectively, then $F_{13}(\phi, \psi)$ translates as $\phi' \lor \psi'$.

T12. If $\alpha, \beta \in \mathbb{P_{TV}}$ and translate as $\alpha', \beta'$ respectively, then $F_{11}(\alpha, \beta)$ translates as $\lambda x[\alpha'(x) \& \beta'(x)]$.

T13. If $\alpha, \beta \in \mathbb{P_{TV}}$ and translate as $\alpha', \beta'$ respectively, then $F_{14}(\alpha, \beta)$ translates as $\lambda x[\alpha'(x) \lor \beta'(x)]$.

T14. If $\alpha, \beta \in \mathbb{P_T}$ and translate as $\alpha', \beta'$ respectively, then $F_{12}(\alpha, \beta)$ translates as $\lambda P[\alpha'(P) \& \beta'(P)]$.

T15. If $\alpha, \beta \in \mathbb{P_T}$ and translate as $\alpha', \beta'$ respectively, then $F_{15}(\alpha, \beta)$ translates as $\lambda P[\alpha'(P) \lor \beta'(P)]$.

T16. If $\zeta \in \mathbb{P_T}$ and translates as $\zeta'$, then $F_{16}(\zeta)$ translates as $\zeta'$.

T17. If $\alpha, \beta \in \mathbb{P_{TV}}$ and translate as $\alpha', \beta'$ respectively, then $F_{35}(\alpha, \beta)$ translates as $\lambda P \lambda x[\alpha'(P)(x) \& \beta'(P)(x)]$. 

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T18. If $\phi \in P_T$ and translates as $\phi'$, then $F_{17,n}(\phi)$ translates as $\lambda x.\phi'$.

T19. If $\alpha, \beta \in P_{TV}$ and translate as $\alpha'$, $\beta'$ respectively, then $F_{36}(\alpha, \beta)$ translates as $\lambda \exists \lambda x[\alpha'(E)(x) \lor \beta'(E)(x)]$.

T20. If $\phi \in P_T$ and translates as $\phi'$, then $F_{19}(\phi)$ translates as $\neg \phi'$.

T21. If $\alpha \in P_{IV/IV}, \beta \in P_{IV}$ and $\alpha, \beta$ translate as $\alpha'$, $\beta'$ respectively, then $F_{20}(\alpha, \beta)$ translates as $\alpha'(\neg \beta')$.

T22. If $\alpha \in P_{TV/IV}, \beta \in P_{IV}$ and $\alpha, \beta$ translate as $\alpha'$, $\beta'$ respectively, then $F_{37}(\alpha, \beta)$ translates as $\alpha'(\neg \beta')$.

T23. If $\alpha \in P_{IV/T}, \phi \in P_T$ and $\alpha, \phi$ translate as $\alpha'$, $\phi'$ respectively, then $F_{21}(\alpha, \phi)$ translates as $\alpha'(\neg \phi')$.

T24. If $\alpha \in P_T, \beta \in P_{TV/T}$, and $\alpha, \beta$ translate as $\alpha'$, $\beta'$ respectively, then $F_{22}(\alpha, \beta)$ translates as $\beta'(\neg \alpha')$.

T25. If $\alpha \in P_{1}, \delta \in P_{TV}$, and $\alpha, \delta$ translate as $\alpha'$, $\delta'$ respectively, then $F_{23}(\alpha, \delta)$ translates as $\alpha'(\neg \delta')$.

T26. If $\alpha \in P_{IV/IV}, \delta \in P_{IV}$, and $\alpha, \delta$ translate as $\alpha'$, $\delta'$ respectively, then $F_{24}(\alpha, \delta)$ translates as $\alpha'(\neg \delta')$. 

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T27. If $\alpha \in \mathcal{P}(\mathcal{L})$, $\beta \in \mathcal{P}(\mathcal{L})$, and $\alpha, \beta$ translate as $\alpha', \beta'$ respectively, then $F_{25}(\alpha, \beta)$ translates as $\alpha'(\neg \beta')$.

T28. If $\delta \in \mathcal{P}(\mathcal{L})$, $\alpha \in \mathcal{P}(\mathcal{L})$, and $\delta, \alpha$ translate as $\delta', \alpha'$ respectively, then $F_{26}(\alpha, \delta)$ translates as $\lambda \mathcal{P}(\lambda x \delta'(\mathcal{P})(\neg \alpha')(x))$.

T29. If $\alpha \in \mathcal{P}(\mathcal{L})$ and translates as $\alpha'$, then $F_{27}(\alpha)$ translates as $\lambda \mathcal{P}(\lambda x [\alpha'(x) \& \forall \mathcal{P}(x)]$.

T30. If $\alpha \in \mathcal{P}(\mathcal{L})$ and translates as $\alpha'$, then $F_{28}(\alpha)$ translates as $\lambda \mathcal{P} \forall \mathcal{P}(\lambda x [\alpha'(x)])$.

T31. If $\phi \in \mathcal{P}(\mathcal{L})$, $\alpha \in \mathcal{P}(\mathcal{L})$, and $\phi, \alpha$ translate as $\phi', \alpha'$ respectively, then $F_{29}(\phi, \alpha)$ translates as $\lambda x \psi [\psi \& \alpha'(x)]$, where $\psi$ is the result of replacing all occurrences of $x_n$ in $\phi'$ by occurrences of $x_m$, where $m$ is the least even number such that $x_m$ has no occurrences in either $\phi'$ or $\alpha'$.

T32. If $\phi \in \mathcal{P}(\mathcal{L})$, $\alpha \in \mathcal{P}(\mathcal{L})$, and $\phi, \alpha$ translate as $\phi', \alpha'$ respectively, then $F_{30}(\phi, \alpha)$ translates as $\lambda \mathcal{P}[\alpha'(\neg \lambda x \psi [\psi \& P(x_m)])$, where $\psi$ is as in T31.

T33. If $\alpha \in \mathcal{P}(\mathcal{L})$, $\beta \in \mathcal{P}(\mathcal{L})$, and $\alpha, \beta$ translate as $\alpha', \beta'$ respectively, then $F_{31}(\alpha, \beta)$ translates as $\alpha'(\neg \beta')$. 

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T34. If $\phi \in P_T$ and translates as $\phi'$, then $F_{32}(\phi)$ translates as $K\phi'$.

T35. If $\alpha \in P_T$, $\delta \in P_{(IV//t)/T}$, and $\alpha$, $\delta$ translate as $\alpha'$, $\delta'$ respectively, then $F_{33}(\alpha, \delta)$ translates as $\delta'('\alpha')$.

T36. If $\phi \in P_T$, $\delta \in P_{TV/t}$, and $\phi$, $\delta$ translate as $\phi'$, $\delta'$ respectively, then $F_{34}(\phi, \delta)$ translates as $\delta'(\phi')$.

T37. If $\phi \in P_T$, $\delta \in P_{IV//t}$ or $P_{IV///t}$, and $\phi$, $\delta$ translate as $\phi'$, $\delta'$ respectively, then $F_{38}(\phi, \delta)$ translates as $\delta'(\phi')$.

T38. If $\alpha \in P_{T//CN}$, $\beta \in P_{CN}$, and $\alpha$, $\beta$ translate as $\alpha'$, $\beta'$ respectively, then $F_{7}(\alpha, \beta)$ translates as $\alpha'(\beta')$.

TT1. – TT9. Identity mapping.

TT10. If $\phi \in P_T$ and translates as $\phi'$, then the result of applying SS10 to $\phi$ translates as $(\exists x_n)\phi'$.

TT11 – TT13. Identity mapping.

MP1. $(\exists x)[x = \alpha]$ where $\alpha = t, h, k, z$.

MP2. $(\exists x)[x = \alpha]$ where $\alpha = b$.

MP3. $(\exists S)(\forall x)(\forall y)[\delta(x, P) \leftrightarrow P(\lambda y[S(x, y)])]$, where $\delta$ translates naguru, keru, mitukeru, sem eru, kowai, kirai da.

MP4. $(\exists O)(\forall x)(\forall y)(\forall z)[\delta(O)(Q)(x) \leftrightarrow Q(\lambda y[P(\lambda w[O(x, y, w)])])]$, where $\delta$ translates ataeru, syookaisuru.

MP5. $[\alpha(\beta)(x) \rightarrow \beta(x)]$ where $\alpha$ translates yoi, rippa na (i.e., expressions of category CN//CN), and $\beta$ translates expressions of category CN.

MP6. $[\text{saseru}'(x, P) \rightarrow (\exists P)(\forall x)(\forall y)[\gamma P(x) \rightarrow \gamma P]]$.

MP7. $[\gamma(P)(x) \rightarrow P(x)]$ where $\gamma$ translates expressions of category IV//IV.

MP8. $[\delta(x, P) \rightarrow \gamma P]$ where $\delta = \text{saseru}', \text{rareru}'$.

MP9. $[\text{saseru}'(x, P(\text{zibun-de}'(P))) \rightarrow \text{saseru}'(x, (P(P)))]$.
where \( \delta \) translates de.

MP1 guarantees rigid designation of certain PNs. MP2 ensures t-rigidity of some PNs. MP3 guarantees the extensionality of certain transitive verbs with respect to the object. MP4 guarantees the extensionality of di-transitive verbs with respect to both indirect and direct objects. MP5 guarantees that, for instance, if \( \text{Hanako-ga rippa na zyoyuu da} \) "Hanako is a fine actress," then \( \text{Hanako-ga zyoyuu da} \) "Hanako is an actress." MP6 guarantees that if someone stands in saseru "cause" relation to a certain proposition, then that someone's doing (or being) something causes the event expressed by the proposition. MP7 guarantees that, for instance, if \( \text{Hanako-ga zibun-de hasiru} \) "Hanako runs by herself," then \( \text{Hanako-ga hasiru} \) "Hanako runs." MP8 ensures that if someone stands in either saseru "cause" or rareru "(Indirect Passive)" relation to some proposition, then that proposition is true at the given index. MP9 guarantees that the ni-causative always entails the corresponding o-causative. MP10 requires the extensionality of adverbial case particles.
Footnotes to Chapter VII

1N-nin "n-people of" is a schematic form for Japanese expressions that consist of numeric expressions and classifiers; for the actual forms, cf. section 2.3, Chapter IV, esp. p.150.

2No is tentatively included in the Fragment since the genitive of reflexive pronoun zibun-no "(lit.) self's" often occurs in our discussion on reflexivization.

3See Appendix C.

4In particular, the auxiliary syntactic notions that are most important are: "is a feature specification of" as appears in S9 (cf. footnote 16, Chapter V), "a main verb of" (footnote 24, Chapter V), "contains" (footnote 27, Chapter IV), and "coordinate nodes" (cf. section 2.6, Chapter V). Also assumed is a surface constraint like Surface RCC, p.216, and double-o constraint (p.323). Rules of morphological and morphophonemic interpretations are also assumed.

5Here REPLACE(-te,ϕ) is to be understood in such a way that -te replaces either -Pres or -Past of the main verb of ϕ; REPLACE thus probably should be made a function with three arguments such that, for instance, REPLACE(-te,-Pres,ϕ) is an
operation that substitutes -te for -Pres that occurs in a specified position in φ.

6 See Appendix B.

7 That is, the format of presentation follows that of PTQ. Additional semantic apparatuses pertaining to Qs and causation are borrowed respectively from Bennett (1975: Chapter 3) and Dowty (1976: 208); neither treatment, however, is not completely satisfactory: the former substitutes clarity for vagueness when we actually want "vague talk", and the latter leaves much to be desired as to the characterization of the notion of causation, as Dowty (loc. cit.) comments about it. McCawley (1976) examines a number of paradigm cases of causation. Since our discussion does not crucially depend on the precise characterization of the notion of causation, I will follow Dowty's relatively simple account in which -@* "causes" is a simple sentence connective.

8 In what follows, I omit the feature specification of ω ∈ {T, CN, Q}.

9 Strictly speaking, the translation should be as follows (cf. also footnote 1 above).

h. n-nin translates as λP:λQ(∃f(n)x)[∀P(x) & ∃Q(x)], where
n is a standard name in Japanese of any finite cardinal, and \( f \) is a mapping from the expressions of Japanese to finite cardinals such that \( f(n) \) is the finite cardinal denoted by \( n \) if \( n \) is a standard Japanese name of a finite cardinal.
APPENDIX A

i. A selected list of symbols of intensional logic.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation or definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>t, h, k, z, b, m</td>
<td>distinct constants of individuals</td>
</tr>
<tr>
<td>x, y, w; x_n</td>
<td>variables over individuals; v_1, e, v_3, e, v_5, e; v_2, n, e</td>
</tr>
<tr>
<td>P, Q</td>
<td>variables over properties of individuals; v_0, &lt;s, &lt;e, t&gt;&gt;, v_1, &lt;s, &lt;e, t&gt;&gt;</td>
</tr>
<tr>
<td>P, Q</td>
<td>variables over properties of properties of individuals; v_0, &lt;s, f(T)&gt;, v_1, &lt;s, f(T)&gt;</td>
</tr>
<tr>
<td>P(x)</td>
<td>x has the property P; abbreviation for ( \forall P(x) )</td>
</tr>
<tr>
<td>R</td>
<td>( v_0, &lt;s, f(T)&gt; )</td>
</tr>
<tr>
<td>R</td>
<td>a constant between individuals indicating the &quot;genitive&quot; relation</td>
</tr>
<tr>
<td>S</td>
<td>a variable over relations-in-intension between individuals; ( v_0, &lt;s, &lt;e, &lt;e, t&gt;&gt; &gt; )</td>
</tr>
</tbody>
</table>
\( O \) a variable over 3-place relations-in-intension between individuals; \( \nu_0, <s, <e, <e, t> > > \)

\( G \) \( \nu_0, <s, <e, f(IV//IV) > > \)

\[ \lambda P \nu P(\exists x \forall Q(x)) = _{\text{def.}} \lambda P(\exists x)[(\forall y)[\forall Q(y) \leftrightarrow x = y] \& \forall P(x)] \]

\( K \) past tense operator

\( ^\wedge \) intension operator; if \( a \) is of type \( a \), then \( ^\wedge a \) is of type \( <s, a> \)

\( v \) extension operator; if \( a \) is of type \( <s, a> \), then \( v a \) is of type \( a \).

\[ \delta \star = _{\text{def.}} \lambda y \lambda x[\delta(\lambda P[P(y)])(x)) \] where \( \delta \in \text{ME}_f(TV) \)

\[ = _{\text{def.}} \lambda w \lambda y \lambda x[\delta(\lambda P[P(w)])(\lambda Q[Q(y)])(x)) \] where \( \delta \in \text{ME}_f(TTV) \)

ii. Terminological convention.

<table>
<thead>
<tr>
<th>Term</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>set</td>
<td>The denotation of an expression of type ( &lt;a, t&gt; ) is called a <strong>set</strong> of whatever is denoted by expressions</td>
</tr>
</tbody>
</table>
of type $a$; e.g. an expression of type $<e,t>$ denotes a set of individuals; an expression of type $<s,t>,t>$ denotes a set of propositions.

An expression of type $<s,<a,t>>$ is said to denote a property of whatever is denoted by expressions of type $a$; e.g. an expression of type $<s,<e,t>>$ denotes a property of individuals; expressions of type $<s,<s,<e,t>>,t>>$ denote properties of properties of individuals.
APPENDIX B

ON RAISING AND PASSIVE

Kuno (1976) argues convincingly for the existence of (optional) Subject Raising, the formulation of which we have given tentatively as SS12, which raises a complement subject to a major clause object, converting (a) sentences below to the corresponding (b) sentences.

1) i. a. Hanako-wa Taroo-ga baka da to omou
   Hanako Taroo fool is comp. think
   "Hanako thinks Taroo is a fool."
   b. Hanako-wa Taroo-o baka da to omou
   "Hanako thinks Taroo to be a fool."
ii. a. Hanako-wa Taroo-ga kasikoi to omotta
   Hanako Taroo clever comp. thought
   "Hanako thought Taroo was clever."
   b. Hanako-wa Taroo-o kasikoi to omotta
   "Hanako thought Taroo to be clever."

(For details and examination of alternatives to the Raising analysis, see Kuno (1976).) Kuno gives ample evidence showing that in each (b) sentence above Taroo-o behaves like a major clause object. But there is one respect in which it
does not behave like an ordinary object. To quote Kuno (1976: 44), "... in Japanese, it seems that the raised subject cannot appear in pure passive sentences (i.e., our direct passive sentences/TS)." Thus the apparent passive versions of (b) sentences above all have the connotation of adversity; hence they are all indirect passives. Thus:

2) a. Taroo-wa Hanako-ni baka da to omow-areru  
   (lit.) "Taroo is thought to be a fool by Hanako."
   
   b. Taroo-wa Hanako-ni kasikoi to omow-areta  
   (lit.) "Taroo was thought to be clever by Hanako."

Or to use Kuno's way of glossing, (a) and (b) above may be glossed as (a) and (b) below (cf. Kuno's (101), (102)).

3) a. "To Taroo's chagrin, Hanako thinks that he is a fool."
   b. "To Taroo's chagrin, Hanako thought that he was clever."

The question naturally arises as to why (b) sentences of (1) do not passivize to become direct passives. (John Haig (personal communication) observes that this is true only for a specific agent; a sentence like Taroo-wa minna-ni kasikoi to omow-areteiru "Taroo is thought to be clever by everyone." does not necessarily have the connotation of adversity. Though a verb aspect also seems to be involved here, I agree with Haig on this judgment. At present I do not know what to do with examples like Haig's, and I would like to tentatively
exclude them from discussion.) Kuno (1976: footnote 22) tentatively hypothesizes that "pure passivization (i.e., direct passive formation /TS) does not apply to the object noun phrase that was not in the same position in the underlying structure." He notes that his observation is consistent with at least one other phenomenon in Japanese that has to do with the passive of causative sentences; taking an o-causative approach to causatives (cf. section 4.2.1, Chapter V), he argues that the passive of causative sentences can be only interpreted to have the o-causative reading, based on the basic semantic distinction that the o-causative indicates a sort of coercion while the ni-causative indicates permission; ergo the above generalization about passivization and the raised subject. But since the semantic distinction between the o-causative and the ni-causative that Kuno seems to be basing his argument upon may not be correct, as shown by Tonoike (1979: Chapter 4, especially section 4.1), Kuno's point that the passive of a causative sentence comes only from the o-causative may not be correct, either. We maintained in section 5.2.5.1, Chapter V that there is in general no way of determining whether a direct passive comes from a ni-causative or an o-causative except some cases where the verb involved requires an o-causative source. (But cf. the second paragraph of footnote 62, Chapter V for Kuno's more recent position on causative constructions.)
This again brings us to the question: why do sentences in (2) have only the indirect passive reading? or why is it impossible to form a direct passive from (b) sentences of (1)? Given our formulation of direct passive S25, which forms an expression of category IV from an expression of category TV, it is simply the case that a sentence like (lib) or (liib) cannot possibly become a direct passive, for note that Raising SS12 operates on a sentence and generates another sentence, raising the complement subject to a major clause object; therefore the output of Raising, which is of category t, cannot feed into the direct passive formation S25, which requires as input an expression of category TV. Thus the fact that sentences like (2) can only be interpreted to be instances of indirect passives lends further support for our analysis of direct and indirect passives; the former operates on an expression of category TV, and the latter operates on an expression of category t. If passives are analyzed along this line, then there is nothing unusual to an observation like Kuno's that newly-created objects via a sentential operation do not passivize to become the subjects of direct passives.
APPENDIX C

OPTIONAL EQUI

Observe first the following sentences.

1) i. a. ?Taroowawa Hanako-ni Hanako-ga utau yoo ni nozonda
     Taroo Hanako Hanako sing comp. desired
     "Taroo desired of Hanako that Hanako sing."

   b. Taroowawa Hanako-ni kanozyo-ga utau yoo ni nozonda
      she
     "Taroo desired of Hanako that she sing."

   c. Taroowawa Hanako-ni ø utau yoo ni nozonda
      (lit.) "Taroo desired of Hanako that ø sing."

ii. a. ?Taroowawa Hanako-ni Hanako-ga utau yoo ni settokusita
     Taroo Hanako Hanako sing comp. persuaded
     "Taroo persuaded Hanako that Hanako sing."

   b. Taroowawa Hanako-ni kanozyo-ga utau yoo ni settokusita
      she
     "Taroo persuaded Hanako that she sing."

   c. Taroowawa Hanako-ni ø utau yoo ni settokusita
      (lit.) "Taroo persuaded Hanako that ø sing."

Verbs like nozomu "desire of someone that" and settokusuru
"persuade someone that" may optionally delete the coreferential
complement subject under identity with the main clause object. Note that in these cases the only item effected is the complement subject; other parts remain unaffected. Specifically the complement verb and the complementizer remain unaffected. This is in sharp contrast to the case of obligatory Equi-NP Deletion in the standard treatment, where the deletion of the complement subject results in the subsequent obligatory raising of the complement verb to the main clause verb; moreover, the element thus raised must be the stem of the complement verb. To take one example, compare the sample derivation of a causative sentence within the standard treatment that utilizes both obligatory Equi-NP Deletion and Verb Raising below (cf. section 4.0, Chapter V).

2) Taroo Hanako [Hanako \(\text{utaw-?}\) \(S\) saseru

\hspace{1cm} \downarrow \text{Equi-NP Deletion}

Taroo Hanako [ \(\emptyset\) \(\text{utaw-?}\) \(S\) saseru

\hspace{1cm} \downarrow \text{Verb Raising}

Taroo Hanako [ \(\emptyset\) \(\emptyset\) \(\text{utaw-?-saseru}\)

\hspace{1cm} \downarrow \text{Tree pruning}

Taroo Hanako \(\text{utaw-?-saseru}\)

"Taroo causes Hanako to sing."

Compared with cases of optional Equi as in (1), a derivation like (2) significantly differs from them in that 1) Equi must be applied, 2) Verb Raising must be applied, 3) only the stem...
of the complement verb is to be raised, and 4) saseru "cause" and the like are the only verbs that do not require any complementizer. In other words, subsequent to the application of obligatory Equi, every feature that is associated with a clause-hood must be destroyed in order to arrive at a surface structure. Since the deletion of a clause element, whether by optional Equi as in (1), or by discourse deletion, or by some other identity deletion as by our SS7, does not affect other parts of the clause, it is indeed very strange that only those cases that require an obligatory application of Equi (in the standard treatment) should affect the internal and external clause structures so much so that no trace of a clause would be left on the surface save for the verb stem of the original complement verb. One might naturally call in question the adequacy of obligatory Equi and Verb Raising as possible rules of a grammar. Indeed if a grammar is properly constrained, as our grammar is, an analysis like (2) simply becomes an impossible analysis within the grammar. Thus in our grammar, in which all syntactic rules are optional and unordered, the case of optional Equi is completely parallel to other cases of deletion — such deletion is not operationally bound with any other syntactic rules. In this respect I believe our syntactic analysis is more appropriately constrained than the standard analysis, and hence is to be preferred.
As for the actual formulation of (optional) Equi, I have given it as SS13, which is more tentative than definitive. The only point I wanted to make clear in this rule is that the deletion must be effected under referential identity of subscripted pronouns because of a contrast like the following.

3) a. *Taroo-wa subete-no nihonzin-ni subete-no nihonzin-ga
    Taroo all Japanese all Japanese
    utau yoo ni nozonda
    sing comp. desired
    "?Taroo desired of every Japanese that every Japanese
    sing."

b. Taroo-wa subete-no nihonzin-ni karera-ga utau yoo ni
    they
    nozonda
    "Taroo desired of every Japanese that he (lit. they)
    sing."

I am at present unable to offer anything substantially interesting in the way of stating the like-subject constraint a verb like nozomu "desire of someone that" seems to require other than a by-fiat declaration, as in the standard approach, that verbs like nozomu require PRO for their complement subject and main clause object while verbs like yakusokusuru
"promise to someone that" require $\text{PRO}_n$ for their complement subject and main clause subject at the time these form expressions of categories IV and t, respectively. (Recall that our analyses of obligatory equi-NP predicates in section 4, Chapter V made like-subject constraints unnecessary in those cases.) Given this, a sentence like (lib) may be generated as follows, omitting minor details.

4) Taroo-ga Hanako-ni kanozyo-ga utau yoo ni nozomu :S9

    Hanako Taroo-ga $\text{PRO}_4$-ni $\text{PRO}_4$-ga utau yoo ni nozomu :S2

    "Hanako"

    Taroo $\text{PRO}_4$-ni $\text{PRO}_4$-ga utau yoo ni nozomu :S3

    "Taroo"

    $\text{PRO}_4$ $\text{PRO}_4$-ga utau yoo ni nozomu :S36

    "$\text{PRO}_4$"

    $\text{PRO}_4$-ga utau :S2 nozomu

    "desire of someone that"

    $\text{PRO}_4$ utau

    "$\text{PRO}_4$" "sing"

If we apply optional Equi SS13i prior to the application of S9 above, we get (lic). As the rules stand, a sentence like (lia) is not generated in our grammar. Should (lia) be better generated as a grammatical sentence, the most natural way would be to relax the like-subject constraint in such a way
that all members of \( E_n \) be included in the statement of this constraint (cf. also (3)). It appears to me, however, that this as well as other aspects pertaining to the like-subject constraint must be explainable in terms of a more fundamental semantic principle having to do with verbs like nozomu "desire of someone that" or yakusokusuru "promise to someone that" though this, I admit, is easier said than done.
APPENDIX D

NOTES ON GENERICS

There are many respects in which generic statements cannot be treated in a parallel manner that we treat individual level sentences in this dissertation. I shall outline some of them here and leave its integration to a future research.

0. Generic statements are always non-reportive, while the present tense examples we have been concerned with are reportive; thus the latter describes, or reports, on-going events while the former does not imply that an event is taking place at the time and world the statement is evaluated at.

1) a. kappa-wa zyoozu-ni oyogu
   kappa well swim
   "Kappas swim well."

   b. Taroo-ga Ziroo-o osu
   Taroo Ziroo push
   "Tarloo pushes Ziroo."

Even if (a) is true, it does not follow that kappas are
actually swimming, but if (b) is true, it does follow that Taroo actually pushes Ziroo at the index it is evaluated at.

1. Universality seems to be claimed to hold of a subject of a generic statement with respect to the property expressed by the predicate even though there is apparently no quantifier present.

2) *inu-wa hoeru*
   
   dog bark
   "Dogs bark."

   Though it is often remarked that a sentence like (2) means something like:

3) "Dogs typically bark."

unless some kind of universal quantification is assumed, it is difficult to see why the following has a very odd ring to it.

4) *inu-wa hoeru ga uti-no Shiro-wa hoenai*

   dog bark but our Shiro bark-not
   "Dogs bark, but our (dog) Shiro does not bark."

   Compare with this the following perfectly normal statement,
in which the first clause more closely corresponds to (3).

5) inu-wa hoeru mono da    ga uti-no Shiro-wa hoe-nai
    dog    bark is generally so but our Shiro    bark-not
    "Dogs generally bark, but our (dog) Shiro does not bark."

What then is the semantic difference between (2) and the first clause of (5)?

2. The generic subject is not necessarily extensional with respect to a designated world-time in which it is evaluated. Yet such a statement can be true. Thus (1a) is true in our world although there exists no such thing as kappa in our world so far as we know. In non-generic statements, the appearance of such a noun in the subject position immediately renders the sentence false due to the extensionality of subjects; thus the following, which is clearly non-generic because of the present progressive, is false if evaluated in a world like ours.

6) kappa-ga oyoide-iru
   kappa    is swimming
   "A kappa is swimming."

3. Similarly, the object is not necessarily extensional in generic statements with respect to a designated world in which the sentence is evaluated even when the verb in the predicate
is an ordinary extensional verb.

7) **uma-wa ninzin-o taberu**

- horse carrot eat

"Horses eat carrots."

(7) could be true even if it turns out that there is no carrot at the index the sentence is evaluated at.

4. A generic statement with a bare CN subject and that with a PN subject show syntactic asymmetry that probably derives from their basic semantic differences. Compare (i) and (ii) below.

8) i. a. **inu-wa hoeru**

- dog bark

"Dogs bark."

b. **inu-wa hoeru mono da**

- is generally so

"Dogs generally bark."

ii. a. **Hanako-wa tabako-o suu**

- Hanako smoke

"Hanako smokes."

b. **Hanako-wa tabako-o suu mono da**

- is generally so

"Hanako generally smokes."
((8iib) is acceptable if understood to mean "It is generally the case that people named Hanako smoke.") Why should this be so? What semantic effects does mono da, which literally means "thing is", have on what aspects of generic statements? Note that the following, in which the generic verb has been changed to the past tense, are both grammatical.

9) a. inu-wa hoeta mono da
   "Dogs used to bark."

   b. Hanako-wa tabako-o sutta mono da
   "Hanako used to smoke."

   Why?
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