Referent identification for ellipted arguments in Japanese

Shigeko Nariyama

Submitted in total fulfilment of the requirements of the degree of Doctor of Philosophy

March 2000

Department of Linguistics and Applied Linguistics
The University of Melbourne
Australia
Abstract

Nominal arguments, such as the subject and the object, are not grammatically required to be overt in Japanese, and are frequently unexpressed, approximately 50% of the time in written narrative texts. Despite this high frequency of ellipsis, Japanese is not equipped with such familiar devices as the cross-referencing systems and verbal inflections commonly found in pro-drop languages for referent identification. Yet the mechanisms governing argument ellipsis have been little explicated. This thesis elucidates the linguistic mechanisms with which to identify the referents of ellipted arguments.

These mechanisms stem from three tiers of linguistic system. Each sentence is structured in such a way as to anchor the subject, (using Sentence devices following the principle of direct alignment), with argument inferring cues on the verbal predicate (using Predicate devices). These subject oriented sentences are cohesively sequenced with the topic as a pivot (using Discourse devices). It is this topicalised subject which is most prone to ellipsis. I develop an algorithm summing up these mechanisms, using naturally occurring texts. I demonstrate how it can detect the existence of ellipsis in sentences and track the referential identity of it.

A generalisation for ellipsis resolution and the way in which the algorithm is constituted is as follow. Sentence devices formulate sentences to make the subject most prone to ellipsis, discourse devices enable the interaction of wa (the topic marker) and ga (the nominative marker), which mark the majority of subjects, to provide the default reading for referent identification of ellipsis, and predicate devices furnish additional cues to verify that reading. Since Japanese is an SOV language, it is intuitively tenable from the perspective of language processing that the interplay of wa/ga representing subjects gives initial cues for anticipation of what may be the referent of the ellipsis, and this default interpretation is validated or disconfirmed (or even supplemented in the case of undercoded sentences) by cues from predicate devices. This multiple layering of mechanisms, therefore, can determine referents for ellipted arguments more accurately.
Acknowledgements

First and foremost, I would like to express my heartfelt thanks to Nick Evans, my thesis supervisor and friend, who has supported and encouraged me through many years of work. He has always shown me the utmost consideration and given me in-depth and inspiring counsel. Without his highly professional and thorough supervision, this thesis would not have come to fruition. I would also like to sincerely thank the other members of my PhD committee, Peter Austin, Lesley Stirling, and Dominique Estival, for their invaluable input.

SRI International (Artificial Intelligence Center) in California USA and NTT Communication Science Laboratories (Machine Translation Research Group) in Kyoto Japan provided the international fellowship which allowed me to advance my understanding in the fields of study outside linguistics. My special thanks go to Megumi Kameyama from SRI International and Francis Bond from NTT for being instrumental in organising the visits for me and for their invaluable comments.

I wish to thank the following friends and colleagues who have helped me in various ways in the course of my writing this thesis: Tim Baldwin, Susanna Cumming, Robert Di Nicolantonio, Nick Enfield, Yuko Grieve, Chie Hama, Ilana Mushin, Nick Nicholas, Hitomi Ono, Connal Parsley, Erich Round, Hideo Sawada, Tonya Stebbins. Finally, I thank my family for their emotional support.
# Table of Contents

## [Part 1: Japanese and argument ellipsis]

### Chapter 1 Introduction

1.1 Aims of thesis ................................................................. 2
1.2 Structure of thesis .......................................................... 5
1.3 Corpus and methodology ............................................... 6
1.4 Definition of argument ellipsis ........................................ 8
1.5 Taxonomy of argument ellipsis ........................................ 9
   1.5.1 Three types of referents ........................................... 9
   1.5.1.1 Deictic/indexical referents .................................... 11
   1.5.1.2 Generic referents ............................................... 12
   1.5.1.3 Anaphoric referents .......................................... 14
1.5.2 Location of referent in relation to its ellipsis ............... 20
1.6 Statistical aspects .......................................................... 20
   1.6.1 Genre differences in the rate of argument ellipsis ...... 23
1.7 Motivations for the use of argument ellipsis .................... 31
   1.7.1 Argument ellipsis for efficiency ............................. 31
   1.7.2 Diachronic aspects ............................................... 34
   1.7.3 Synchronic aspects .............................................. 37
   1.7.4 Cultural motivations ............................................ 39
1.8 Indirectness of the Japanese mechanisms for referent identification ............................................. 44

### Chapter 2 Literature review on anaphora

2.1 Discourse approaches to reference-tracking systems .......... 46
2.2 General typology of reference-tracking systems ................ 48
2.3 Syntactic approaches to coreference ................................ 51
2.4 Pragmatic approaches .................................................. 53
   2.4.1 Levinson ............................................................ 54
   2.4.2 Huang ............................................................... 62
2.5 Studies of argument ellipsis in Japanese ......................... 70
   2.5.1 Aspects of deletion ................................................ 71
   2.5.1.1 Parallels with English pronominalisation .................. 72
   2.5.1.2 The wa/ga distinction ....................................... 72
   2.5.1.3 Deletion criteria .............................................. 76
2.5.1.4 Deletion principles ................................................................. 78
2.5.2 Computational approaches: Kameyama ............................................. 82
  2.5.2.1 Lexical Functional Grammar ....................................................... 83
  2.5.2.2 Centering Theory ........................................................................ 85
  2.5.2.3 Remaining issues ................................................................. 92
2.5.3 Approaches in machine translation systems: Nakaiwa et al. ...................95
  2.5.3.1 ALT-J/E ...................................................................................... 96
  2.5.3.2 Problems with ALT-J/E ............................................................... 98

[Part 2: Linguistic devices]

Chapter 3  Predicate devices: Argument inferring morphemes

3.1 Verbal semantics .................................................................................. 105
  3.1.1 Morphological transitive-intransitive distinctions .............................. 106
  3.1.2 Selectional restrictions ................................................................. 109
  3.1.3 Valency dictionary ........................................................................ 112
  3.1.4 Detecting ellipsis ........................................................................... 112
3.2 Inverse verbs ....................................................................................... 113
  3.2.1 Benefactive verbs ........................................................................... 115
    3.2.1.1 In-group and out-group ............................................................. 118
    3.2.1.2 The relation of three benefactive verbs ..................................... 120
    3.2.1.3 Serialised use of benefactive verbs ............................................ 123
    3.2.1.4 Overtness and inverse marking ................................................. 125
  3.2.2 Directional verbs .............................................................................. 128
3.3 Honorification ....................................................................................... 131
  3.3.1 Honorifics on verbal predicates ....................................................... 133
    3.3.1.1 Subject honorific and non-subject honorific ............................... 135
    3.3.1.2 Honorific constructions .......................................................... 137
    3.3.1.3 Referent identification ............................................................. 141
    3.3.1.4 Intransitivity of honorific constructions ..................................... 142
  3.3.2 Honorifics on nouns ....................................................................... 143
3.4 Epistemic morphemes ......................................................................... 147
  3.4.1 Private predicates .......................................................................... 148
    3.4.1.1 Modality changing morphemes ............................................... 149
    3.4.1.2 Suppletive forms ..................................................................... 150
  3.4.2 Aspect .......................................................................................... 152
  3.4.3 Mimetic adverbs ........................................................................... 155
  3.4.4 Other epistemic morphemes ......................................................... 155
  3.4.5 Neutralising elements ................................................................... 158
Chapter 4  Sentence devices I: Principles of Direct Alignment

4.1  Argument structure ................................................................. 185
4.2  Principles of direct alignment ................................................... 186
4.3  Constraint 1: Person/animacy hierarchy .................................... 187
4.4  Comparison with the notion of word order ................................. 191
4.5  Restructuring inverse alignments of arguments .......................... 194
  4.5.1 Inverse verbs ................................................................. 194
  4.5.2 Passive constructions ....................................................... 196
  4.5.3 Intransitive constructions .................................................. 197
  4.5.4 Existential constructions ................................................... 201
4.6  Effects of restructuring: De-transitivization ................................. 205
  4.6.1 Low-transitive sentences .................................................. 207
  4.6.2 Constructions with inanimate arguments .............................. 213
4.7  Constraint 2: Discourse salience .............................................. 216
  4.7.1 Discourse salience in relation to Person/animacy Hierarchy ....... 217
  4.7.2 Two third person arguments .............................................. 219
  4.7.3 Definiteness ................................................................. 222
4.8  Summary of structures and their implications ............................ 225
4.9  Rigidness of the alignment of arguments ................................... 230
4.10 Overriding elements for Principles of direct alignment ................. 234
  4.10.1 Focus ................................................................. 234
  4.10.2 Empathy ................................................................. 236
  4.10.3 Difference between arguments ........................................ 237
  4.10.4 Type of verbs ........................................................... 239
  4.10.5 Overt arguments .......................................................... 240
7.2.1 Text analysis ................................................................. 316
7.2.2 Other examples ............................................................. 353
  7.2.2.1 Text 2: Epistemic morphemes ................................. 354
  7.2.2.2 Text 3: Honorifics ..................................................... 360
  7.2.2.3 Text 4: Reconstructed existential constructions .......... 362
7.2.3 Undercoded sentences .................................................. 365
7.2.4 World knowledge .......................................................... 368
7.3 Evaluation of the algorithm ................................................ 370
7.4 The generalisation for ellipsis resolution .............................. 373

Epilogue .............................................................................. 375

Reference ......................................................................... 377
Appendices: Algorithm ......................................................... 388
  Text 1 ................................................................................. 390
Notes for examples

1) References are noted below the examples. Wherever possible, examples are drawn from the corpus described in §1.3. However, owing to the lack of the structurally suitable examples in the corpus, examples are constructed and given no reference. These constructed examples are checked with other native speakers of Japanese.

2) Brackets in translation denote unexpressed entities. Square brackets [ ] in Japanese sentences denote subordinate clauses.

3) The subject is predominantly marked either by the nominative marker *ga* or the topic marker *wa*. For simplicity and consistency, *ga* is used on all subjects, except for first person, to mark subjects, unless the marking itself causes unacceptability of the sentence (see §4.7.1).

4) The acceptability of sentences varies, and is noted as - '*', '(*), '??', '?', in ascending order of acceptance, which may be on the basis of grammaticality or semantic ambiguity of the sentence (see §5.5.2). In §4.10, I discuss the factors responsible for the variation.

5) Japanese example sentences and words are notated in italic using the Hepburn orthography (phonetically transcribed style which represents a closer pronunciation to how native speakers pronounce it), instead of the more traditional *kunrei* style. Hence, although the reflexive pronoun is commonly spelt 'zibun' in the literature, it is notated as 'jibun' in this thesis.
List of Abbreviations

1=first person  2=second person  A=agent
Acc=accusative  Abl=ablative  Abs=absolutive
Adj=adjective  AdjN=adjectival noun  Alla=allative
Caus=causative  Comp=complementizer  Cop=copula
Dat=dative  DatSB=dative subject  DS=different subject
Dur=durative aspect  Emp=emphatic particle  Erg=ergative
F=feminine  Gen=genitive  H=human
Hon=honorific form  Humb=humble form  IA=inanimate
IG=in-group  Impf=imperfect aspect  IO=indirect object
Loc=locative  LT=low transitive sentence/clause
M=masculine  Neg=negative  NFP=non first person
Nom=nominative  NomOB=nominative object  Nomz=nominaliser
NP=noun phrase  OB=direct object  Obl=oblique
OG=out-group  P=patient/undergoer  Pass=passive
Perf=perfect aspect  pl=plural  Pol=polite
Prog=progressive aspect  Purp=purposive  Q=interrogative marker
rc=relative clause  SB=subject  SFP=sentence final particle
sg=singular  SS=same subject  Top=topic
TopSB=topicalised subject  Vi=intransitive verb  Voli=volitional
Vt=transitive verb  ø=ellipsis (zero anaphor)

The italic subscripts, $h$ (high), $m$ (medium), and $l$ (low), denote the arguments' relative values on the person/animacy hierarchy and in discourse salience, i.e. $h>m>l$ (see Chapter 4).
List of tables

Table 1: The proportions of ellipted subject §1.5.1
Table 2: Rates of ellipted subjects by different genres §1.6
Table 3: Rates of omitted particles by different genres §1.6
Table 4: Five factors related to genre differences §1.6.1
Table 5: Rates of ellipsis §1.6.2
Table 6.1: Changes in the proportion of ellipted subject (The tale of Genji) §1.7.2
Table 6.2: Changes in the proportion of ellipted subject (school texts) §1.7.2
Table 7: Referential progression for character introductions §2.5.1.4
Table 8: Verbal semantic restrictions on the type of referents §3.1.2
Table 9.1: Forms of Direct, Inverse and Converse verbs §3.2.2
Table 9.2: Forms of Direct, Inverse and Converse verbs §4.5.3
Table 10: Sppletive forms of honorification §3.3.1.2
Table 11: Referential forms by in-group and out-group §3.3.2
Table 12: Summary of referent reflection on verbal predicates §3.4.2
Table 13.1: Correlation of structure of wa/ga and DS/SS (tentative) §3.5.2.1
Table 13.2: Correlation of structure of wa/ga and DS/SS (revised) §3.5.4 & §6.2.2
Table 14: Distribution and ratios of complex sentences by wa, ga, and ellipsis §3.5.2.2
Table 15.1: Restructuring formula (stage 1) §4.5.1
Table 15.2: Restructuring formula (stage 2) §4.6
Table 16: Proportion of sentence structures in Japanese and English §4.6
Table 17: Basic formula of argument structures in Japanese §4.8
Table 18: Basic sentence structures and ellipsis §5.1.2
Table 19: Proportion of ellipted subject §5.1.2
Table 20: Acehnese: percentage of ellipsis for actors and undergoers §5.1.2
Table 21: Proportion of argument ellipsis §5.4
Table 22: Basic patterns of argument structures and ellipsis in Japanese §5.6
Table 23: Essence of argument structures and ellipsis in Japanese §5.6
| Figure 1: Referent diagram | §1.5.1 |
| Figure 2: The semantic content hierarchy | §2.4.1 |
| Figure 3: Assumed familiarity and particle selection | §2.5.1.2 |
| Figure 4: Japanese grammar of referential coherence as mental processing instructions | §2.5.1.2 |
| Figure 5: Referential progression in relation to animacy and discourse salience | §2.5.1.4 |
| Figure 6: C-structure and f-structure for Katta. 'ø bought ø.' | §2.5.2.1 |
| Figure 7: Arguments in a proposition | §2.5.2.1 |
| Figure 8: Preference order of shared property | §2.5.2.2 |
| Figure 9: Configuration of auxiliaries | §3.1 |
| Figure 10.1: Person/animacy hierarchy | §3.2 |
| Figure 10.2: Person/animacy hierarchy with direct/inverse alignment | §3.2 & §4.3 |
| Figure 10.3: Person/animacy hierarchy with proximate and obviative systems | §4.7.2 |
| Figure 11: Relation of three benefactive verbs | §3.2.1.2 |
| Figure 12: Honorification systems | §3.3.1 |
| Figure 13: Phrase structure for example (107) | §3.5.3.2 |
| Figure 14: Two types of di-transitive verbs | §4.5.3 |
| Figure 15: Discourse salience in relation to Person/animacy Hierarchy | §4.7.1 |
| Figure 16: Correlation between unmarked subject markers and the animacy hierarchy / discourse salience | §4.7.1 |
| Figure 17.1: Transitivity of structures | §4.8 |
| Figure 17.2: Transitivity of structures and ellipsis | §5.1.2 & §5.6 |
| Figure 18: The basic mechanism of referent identification | §6.1 |
| Figure 19: Wa, ga, and ellipsis in relation to continuity of referent | §6.1 |
| Figure 20: Salient referent order list | §6.3 |
| Figure 21: The mechanisms of ellipsis resolution | §6.4 |
Part 1: Japanese and argument ellipsis

三千の 俳句を閲し、柿二つ

SB 3000-Gen haiku-OB pore and SB persimmon-OB two pieces Verb
'After (I)'d pored over 3000 haiku, (I earned) two persimmons.'

Haiku poem by Masaoka Shiki (1867-1902) (see §1.7.4)
Chapter 1  Introduction

1.1  Aims of thesis

Nominal arguments, such as the subject and the object, are not grammatically required to be overt in Japanese, and they are frequently unexpressed. For example, the following sequence of sentences involves a number of unexpressed arguments. However, the meanings of such sentences are unambiguous to native speakers of Japanese, who will incontrovertibly interpret the sentences as the given translation:

"ו ø Yame yoo ka." ø ø Tsuma to kodomo no koto-o kangaeru. SB OB quit Voli Q SB Gen wife and children Gen things-OB think
... ø ø Tsuma-ni hanasu to, ø ø kantanni dooishi te kureta. SB Gen wife-IO say when SB IO easily agree and gave 'Shall (I) quit (the job)? (I) think about (my) wife and children. .... When (I) told (my) wife, (she) agreed (with me) easily.'

The main aim of this thesis is to elucidate the linguistic mechanisms with which to identify the referents of unexpressed arguments; namely to answer the question 'how do speakers of Japanese construct the given interpretation for sentences like (1), when sentences contain so many unexpressed arguments?' This question is finally answered in Chapter 7, after the various sub-mechanisms have been explicated and integrated.

These unexpressed arguments will be referred to as 'ellipsis' (see §1.4 for a proper definition) in this thesis. In the linguistic literature, the term 'ellipsis' generally has a wider reference, including both VP ellipsis and NP (nominal and pronominal) ellipsis, but this thesis is restricted to dealing with the ellipsis of nominal arguments, and 'ellipsis' here is understood as 'NP ellipsis'.

Argument ellipsis is frequent in Japanese. The rates of ellipsis vary according to the type of texts (see §1.6.1). As will be discussed in detail in §1.6.2, it has been reported that in written narrative approximately 50% of arguments are ellipted (Watanabe 1989) and in conversation over 70% of arguments are ellipted (The
National Language Research Institute of Japan 1955, Shibamoto 1983, Hinds 1983, Mizutani 1985). Despite this high frequency of ellipsis, Japanese is not equipped with grammaticalised devices such as cross-referencing systems and verbal inflections commonly found in pro-drop languages for referent identification, and yet the mechanisms of ellipsis remain little explicated in the literature (Shibatani 1990:391). Hence, it is the general view in the current literature that referential identification of ellipsis is sought in 'context', 'mutual knowledge', 'sociolinguistic variables', or even 'intuition' (e.g. Hinds 1978:137, Foley and Van Valin 1984, Tsujimura 1996, see §2.2). Consequently, Japanese is sometime perceived as 'vague' or 'illogical' by non-native speakers of Japanese (Mikami 1970, Shibatani 1990).

The mechanisms for referential identification of ellipted arguments are extremely intricate but by no means as elusive as the commonly held view would have it. No matter how vague or illogical Japanese may look to non-native speakers of Japanese, since speakers of Japanese have little trouble communicating among themselves, there must be concrete linguistic mechanisms with which they identify referents of ellipted arguments. This presumption is easily vindicated from the way in which learners of Japanese as a second language make mistakes in expressing arguments when they should be ellipted, or vice versa. For example, the following passage was composed as a postcard to a friend by a learner of Japanese who had studied Japanese for two years at university:

(2) シドニーに行った。とても良い所だ。行かなければならない。

SB Sydney to went SB very good place Cop SB go must
'I went to Sydney. (It) is a very nice place. (You) must visit (there too).'

The first sentence is perfectly acceptable. However, the second sentence takes an extra inference to understand the meaning, and the third is incomprehensible. The reasons for this outcome are explained in §7.2.3, after the mechanisms have been explicated.

Learners of Japanese are generally quick to learn from the frequency of ellipsis which they encounter that nominal arguments are often absent in Japanese.
But they learn this without formal instructions. This is only natural, given that the mechanisms of ellipsis have not been fully explicated, with the result that their teachers cannot explain the relevant mechanisms to them explicitly. Consequently, learners of Japanese employ zero expressions randomly or work out their own model of ellipsis. Some elide all arguments, all first and second person, or all subjects, as in (2). The fact that these strategies generate unacceptable sentences shows that making of zero expressions is not a random process, but is strictly constrained by some concrete mechanisms around which Japanese grammar is organised and which govern how ellipsis operates. The commonly held view in the present literature mentioned above represents a clear indication of deficient knowledge on this subject within linguistics, and it is these mechanisms that are the subject of this study.

The investigation of ellipsis resolution in Japanese may also be of interest for study of anaphora from a cross-linguistic perspective. Chomsky (1982:19) states his view that anaphora reflects underlying principles of innate universal grammar. If he is correct in saying that anaphora has universal implications, this study may be of interest in further explicating the anaphoric systems of other languages. Even with common means of referent identification, such as cross-referencing and pronominals, if there exists more than one potential referent available in a given context, there will be problems in determining the exact referent for a clitic and pronominal, and hence we must conclude that other means contribute to successful referent identification (see Shibatani 1990:390, Foley and Van Valin 1984:325, see also §2.2). Japanese exploits anaphora to an extreme degree by abundantly using ellipsis without such devices as cross-referencing systems and verbal inflections. It is expected, therefore, that it will offer a number of different devices for referent identification, and these may shed light in exploring and providing a more comprehensive explanation for anaphoric resolutions in other languages.

Furthermore, the investigation of mechanisms for ellipsis resolution is a subject of interest not only in anaphora and theoretical syntax, but also in other areas of study. Ellipsis causes a barrier to mastering the Japanese language for non-native
speakers, as explained above. The investigation is also vital for computational research on translating Japanese into another language. This is particularly difficult when translating into a language like English whose syntax strictly requires arguments to be overt for well-formedness; the extensive use of dummy subjects in English highlights this point. The corresponding ellipted arguments in Japanese must be retrieved and specified in order to translate them into grammatical English.

After a while, learners of Japanese seem to intuitively acquire the unstated mechanisms of ellipsis to a certain level depending on the individual, similar to the way in which native speakers of Japanese master the mechanisms of ellipsis intuitively without formal instruction. This suggests that humans have the faculty of unpacking and acquiring language mechanisms, even if they cannot spell them out. In terms of machine translation systems from and into Japanese (see §2.5.3), however, because machines do not have the faculty that humans do and cannot rely on intuition as such, they require explicit procedures for deducing the referents of ellipted arguments. The major goal of this thesis is to provide concrete and precise procedures which are not only comprehensible to humans but are also suitable for machine translation systems.

1.2 Structure of thesis

This thesis is divided into three parts.

Part 1, entitled ‘Japanese and argument ellipsis’, provides a basis for the domain of inquiry in this thesis. The remainder of Chapter 1 describes the taxonomy of ellipsis in Japanese including statistical aspects, the definition of ellipsis, and a brief look at motivations for the use of ellipsis; why ellipsis is frequently used and what enables this. Next comes a literature review (Chapter 2) which presents various approaches to understanding anaphora and then more specifically the domain of argument ellipsis in Japanese.

Part 2 explicates the linguistic mechanisms for referent identification of ellipted arguments utilised in Japanese. These mechanisms stem from three tiers of
linguistic information: firstly, the use of argument-inferring morphemes on verbal predicates (*Predicate devices*, discussed in Chapter 3); secondly, tightly constrained argument structures which anchor the subject (*Sentence devices*, Chapter 4) and which induce patterns of ellipsis (Chapter 5); and thirdly, cohesively sequenced discourse structures with the topicalised subject as a pivot and the distinction of *wa* (the topic marker) and *ga* (the nominative marker) (*Discourse devices*, in Chapter 6). The interplay over these three tiers of morphology/semantics, syntax, and discourse devices is the key to determining the referential identity of ellipted arguments.

Finally, in part 3, I devise an algorithm summing up these mechanisms, and demonstrate using naturally occurring texts how it can both detect the existence of ellipsis in sentences and track referential identity.

In short, the aims of this study are two-fold: firstly, to present a detailed description of linguistic mechanisms for ellipsis resolution, and secondly, to formulate an algorithm based on these mechanisms that shows how referents of ellipted arguments are identified.

### 1.3 Corpus and methodology

As will be discussed in §1.5.1, the frequency of ellipsis and the mechanisms used to resolve referential identification for ellipsis are greatly influenced by genres and the written/spoken distinction. To achieve coherence, I focus my investigation on one text type, but I note different features attributed to other types of texts where possible and appropriate. I focus on written narrative monologue texts as the main corpus. As the primary corpus, I chose ‘PHP’ (Peace and Happiness through Prosperity) a monthly magazine containing collections of short stories and essays about a range of everyday topics written by various writers - most of whom are non-professional. In this way, the possible bias due to idiosyncratic writing styles and the type of topic is minimised. A text similar in nature is *Jinken* (Human rights), an article in a local newspaper *Seikachoo Shinbun* (2.1999). This is used as the main text with which to test the algorithm in Chapter 7. Note that novels are not included
in these texts, because, as will be discussed in §1.5.1, they consciously use special writing techniques for effect, which do not represent natural/ordinary language. As a secondary text to PHP, I also use written expository texts from 'Nihon shakai saikoo' (Japanese society: An update, 1991) which is a collection of short texts dealing with different current issues in Japanese society. Two kinds of benefit are attained through the use of the latter texts; 1) we can see that the different text type (narrative versus expository) makes differences in the patterning of ellipsis, 2) good English translations are available for comparison.

Note that spoken language is not examined in this thesis for a number of reasons, discussed in more detail in §1.5.1. Spoken texts have linguistically very different structural organisations from written texts; they often include incomplete sentences (more than two-thirds of the utterances reported in Niyekawa (1984:70) in analysing a script of television drama) and shorter sentences (55% of the 527 utterances consisted of fewer than five words reported in Niyekawa (1984:70)). Furthermore, spoken texts rely greatly on extra-linguistic information, such as gesture and visual cues. These elements of spoken texts will distract the aim of this thesis, which is to investigate the purely linguistic mechanisms for ellipied referent identification. In addition, the phonological input attributed to spoken texts by itself is very convoluted. Since the behaviour of ellipsis varies greatly from one genre to another, considering all these variables would cause confusion; above all, it would be well beyond the scope of a single thesis. Hence, I restrict my focus to written narrative monologue texts.

Note that although my ideal would have been to use only naturally occurring sentences in this thesis, as they undoubtedly provide the most convincing evidence for the phenomenon, it was not always possible to find the exact or most pertinent sentences in the corpus to illustrate the point of argument. Hence, constructed sentences had to be used in such cases, but they were checked with native speakers of Japanese. However, the arguments and claims which are made using these examples, regardless of whether they are constructed or from the corpus, are ultimately tested
against naturally occurring texts in Chapter 7. Note also that this thesis studies reference-tracking, hence the focus is on how to interpret sentences, rather than on how to generate sentences. The differences between the two approaches are discussed in Chapter 2.

I do not strictly follow any established theoretical framework in explaining my proposals, for example, one computational model or pragmatic model. Instead, I attempt to tackle this topic by utilising elements from a number of established works that are beneficial and complement each other in a discussion of ellipsis resolution.

1.4 Definition of argument ellipsis

So far I have used the term 'ellipsis' for unexpressed arguments without a rigorous definition. An ellipsis in this thesis is defined as an argument which is syntactically required, but not realised overtly (i.e. morphologically and phonologically), and which is interpreted by virtue of information contained elsewhere in the linguistic context (Halliday & Hasan 1976:144, Hinds 1986:106, Stirling and Huddleston (to appear)). This thesis deals with elliptical expressions (an expression with a syntactic gap) and their gaps (which may be anaphoric, deictic or generic, and which may be interpretable by virtue of the surrounding linguistic context). As mentioned in §1.1, the term ellipsis generally has a wider reference, but this thesis only deals with ellipsis of nominal arguments.

An ellipted argument is often referred to as a 'zero anaphor', though the term ellipsis has a wider reference encompassing non-anaphoric expressions (i.e. deictic and generic, see §1.5.1). As the name suggests, zero anaphors are one type of anaphor, which have a zero morphological form but are syntactically required. An anaphor, from a Greek word meaning ‘above carrying’ (Matthews 1981:43), is an expression which is used to refer to an entity introduced elsewhere in the discourse by a full referring expression called 'antecedent', as an alternative to repeating the full referring expression. The antecedent can be a word, phrase, sentence, or even a paragraph. The pointing back device which relates an anaphor with its antecedent is
called 'anaphor'. The term 'reference' refers to the real world entity which the expression refers to, which an anaphoric expression and an antecedent expression may both refer to. The term 'referent' is one such entity that is a NP, and hence is of direct relevance to this thesis.

A number of traditional Japanese grammarians (Mikami 1960, 1963, 1970, Ohno 1978, Yanabu 1982, inter alia) have strong dissenting views regarding the labelling of unexpressed arguments as ellipses. They argue that since it is a principle of Japanese grammar that arguments are to be unexpressed if not required and that unexpressed arguments are not required syntactically, this phenomenon is not the same as the deletion implied by the term ellipsis, and that the idea must have originated in a myopic view based on English. I have no space to refute or support this argument in this thesis. In this thesis, I use the term 'ellipsis' on the grounds that one of the purposes of my research is to identify referents of unexpressed arguments which are required to be overt when translated into English. For this reason, when arguments required in English are absent in Japanese, I regard them as ellipses and note them as 'ø' in the examples, although some traditional Japanese grammarians may still object to this account.

1.5 Taxonomy of argument ellipsis

1.5.1 Three types of referents

Halliday and Hasan (1976:33) classify reference (hereafter only referent is referred to) into two types according to whether or not they are anaphoric. One type is called 'exophora' which is non-anaphoric. Exophora is manifested in deictic/indexical referents and generic referents, where there is no mention of their referents anywhere in the text. The other type is called 'endophora' which has an

---

1 The difference between anaphora and anaphor is often ignored, and the term 'zero anaphor' is rather widely used in the literature to refer to a word or phrase instead of a device (see Chapter 2). 'Zero anaphor' is thus a misuse. Furthermore, ellipsis includes non-anaphoric referents, i.e. generic and deictic. Hence, in this thesis I do not wish to use the term 'zero anaphora'. Instead I use 'ellipsis' (sometimes 'unexpressed argument', or 'zero form'), unless when I am quoting literature which specifically use 'zero anaphora'.

overt referent in the text. This represents the relation of a referent with another nominal entity. Endophora is further divided into two subtypes according to the location of the referent. When the antecedent appears before an endophoric expression, the latter is called an anaphor and the device is called anaphora, whereas when the endophoric expression appears before the full identifying expression, it is called a cataphor and the device is called cataphora. This is illustrated as follows (slightly modified from Halliday and Hasan 1976:33):

```
referent

[Non-anaphoric, situational]  [Anaphoric, textual]
exophora  endophora

Deictic/indexical referents  Generic referents

[Deictic/indexical referents]  [Generic referents]

[Antecedent]  [Endophoric expression]

[In preceding text]  [In following text]

anaphora  cataphora
```

**Figure 1: Referent diagram**

Thus, there are three types of referential realisations: deictic/indexical referents, generic referents, and endophors. As stated earlier, this thesis examines endophors as well as making some reference to generic referents and deictic referents of unexpressed first and second person, in view of the fact that these exophors naturally become anaphoric after the first implicit appearance in the text.

'Null-subject' in certain expressions may also represent a syntactic gap. But here the unexpressed subject has no particular referent. This is found in expressions denoting such notions as ambient conditions, state, and time, which are represented by a dummy subject in English.² These tend to be expressed in Japanese by 'de aru / (ni) naru' often preceded by an adverbial phrase, for example (Mikami 1970):

(3) ある日のことである。

---

² Shibatani (1990:361) calls these 'zero-argument predicates'. He also states that meteorological expressions in other languages typically lack a subject.
Aru hi no koto de aru.
some day of Nomz Cop exist
'(It happened) one day.'

(4) 夜になる。
Yoru ni naru.
night become
'(lit.) (It) becomes night. -> It was at night.'

Conventionalised expressions, such as various forms of greeting and set expressions, also often include null-subjects; for example, Kamawanai '(It) doesn't matter', Sumanai'ø Sorry', Arigatoo ø Thank you', and Murimo nai'(One) can't help (it)', in all of which English can also elide the subjects in conversation.3

Following Martin's (1975:183-4) classification of four types of subject, which is comparable to Halliday and Hasan's classification (1976) above with null-subject in expressions, Shibamoto (1983:247) reports the following proportions of ellipted subjects according to the four types, based on an analysis of Japanese conversations:

<table>
<thead>
<tr>
<th>Type</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. mutual knowledge (endophor)</td>
<td>41.3%</td>
</tr>
<tr>
<td>2. deictic referents (first and second person)</td>
<td>32.9%</td>
</tr>
<tr>
<td>3. non-specific</td>
<td>18.4%</td>
</tr>
<tr>
<td>4. null-subject</td>
<td>7.0%</td>
</tr>
</tbody>
</table>

The first type 'mutual knowledge' parallels endophor in Halliday and Hasan's classification, and it comprises 41.3%. The third type 'non-specific' is comparable to generic referents, and it comprises 18.4%. These results are based on dialogue, so that in written monologue texts (the type of text used for this thesis), it is anticipated that there will be fewer deictic referents, particularly of second person (see §1.6).

In what follows, I briefly look at each of the three types of unexpressed referents: deictic/indexical referents, generic referents, and endophors. Note that

3 Sumanai literally means 'It's not finished.' Arigatoo 'Thank you' is an interesting example, in that the derivative form arigatai literally means 'That act you did for me) is hard to exist.' This leads to the meaning 'Therefore it is precious and I thank you.' In English, not only the subject but the object and the verb are ellipted in ø Thanks ' as 'I offer you thanks'.
hereafter I use 'anaphor' loosely by encompassing cataphor instead of 'endophor' for simplicity and familiarity, particularly since it is the prototypical type of endophor.

1.5.1.1 Deictic/indexical referents

Deictic/indexical referents are often left without explicit mention anywhere in the texts, as shown by the figure of 32.9% in Table 1. The identity of these ellipses is mainly retrieved through situational, including visual, contexts. Zero expression of speech act participants (first and second person) is common in conversation, and first person in both oral and written narrative. In conversation, subjects in declarative sentences are often omitted from the start, because they are strongly identifiable as the speaker, viz. first person. Analogously, the ellipted subjects of interrogatives or imperative sentences are understood as the addressee, viz. second person (see §2.5.1.3). In written narratives, ellipsis of this type is strongly associated with first person; my examination of initial sentences in 62 written narrative texts (PHP) reveals that 27.4% of arguments are ellipted and all the ellipses have the writer, i.e. first person as the referent (see §7.1). Apart from first and second person, deictic referents which can be pointed to and are visually recognisable by the addressee, are often unexpressed in conversation. For example, the speaker is sitting at a dinner table and looking at a dish which he is just about to eat, and he may say, 'œ Oishi soo' (tasty look), as in English 'œ Looks good!'. The identity of the ellipsis is easily understood as 'That food that I am looking at', and it cannot be understood as anything else.

1.5.1.2 Generic referents

Generic referents are often ellipted, as the figure of 18.4% shows in Table 1. They are found in sentences which express general concepts, propositions, or old sayings where the referents are not targeted to a particular individual (Shibatani 1990,
Tsunoda 1991). These referents are often expressed in English by unstressed 'they', 'we', 'you', 'one', 'people', 'someone', and the like.\(^4\)

It is often difficult to know whether a sentence with ellipsis is generic or anaphoric (Kameyama 1985:290). Differences in aspect seem to be a good distinguishing element for generic and anaphoric referents. The use of imperfective aspect by its nature tends to denote customary behaviour and consequential / natural outcome, and hence it tends to represent generic uses (see Comrie 1976). On the other hand, the use of perfective aspect expresses a particular rather than a customary event, hence presupposes the existence of a particular referent associated with the event, and therefore it is interpreted as anaphoric.\(^5\) The following sets of sentences demonstrate this factor; the (a) sentences have imperfective aspect and they denote generic referents, while the (b) sentences have perfective aspect and they denote anaphoric referents:

\[\text{(5a) 薬で病気を治す。} \]

\[\text{\textit{The sun rises from the east.}}\]

\[\text{(b) 薬で病気を治す。} \]

\[\text{\textit{The sun rises from the east.}}\]

\[\text{(c) 薬で病気を治す。} \]

\[\text{\textit{The sun rises from the east.}}\]

\[\text{(d) \textit{One} confirms (it) with \textit{own} eyes.}\]

\(^4\) Shibatani (1990:361) uses the term 'Proarb', meaning arbitrary pronoun to describe such generic referents. He also states that cookery recipes often lack a subject.

\(^5\) Shibatani (1990:362) made a similar point, except he regards the difference as tense not aspect (see Comrie (1976) for the discussion of aspect and Comrie (1985) for tense). The distinction of tense and aspect is problematic in modern Japanese, in that its morphological difference has been lost. Both functions are now represented by single form `-ta`, although there used to be two forms of tense `-ki` and `-keri` and four forms of aspect `-nu`, `-tu`, `-tari` and `-ri` until round about the 15th century (Ema et al. 1977:333, see §1.7.2).

Putting aside the issue of ellipsis, the general characteristics of generic sentences seem to be also related with the \textit{wa}/\textit{ga} distinction (see §2.5.1.2, §3.5.2 and §6.1). In addition to having imperfective aspect, generic sentences have a strong tendency to mark the subject by the topic marker \textit{wa} rather than the nominative marker \textit{ga}, and they are stative rather than action-oriented. In the following sentences, (a) which is marked by \textit{wa} and imperfective aspect represents a generic statement; (b) which is marked by \textit{ga} connotes that it is depicting a one-off scene, and the use of imperfective aspect connotes that it is happening right before the speaker's eyes at this moment; (c) which is marked by \textit{wa} and perfective aspect refers to a particular event which happened in the past. Since the proposition of the sentence that the sun rises from the east is impeccable and eternally true, (b) and (c) sound weird and require contexts to be acceptable.

(a) \textit{Taiyo-\textit{wa} higashi kara nobo-\textit{ru}.}  
\textquoteleft\textquoteleft The sun rises from the east.\textquoteright\textquoteright

(b) \textit{Taiyo-\textit{ga} higashi kara nobo-\textit{ru}.} 
\textit{The sun rises from the east.}

(c) \textit{Taiyo-\textit{wa} higashi kara nobot-\textit{ta}.}  
\textquoteleft\textquoteleft The sun rises from the east.\textquoteright\textquoteright

(d) \textit{\textit{Jibun-no me-de} tashikameru.}  
\textquoteleft\textquoteleft (One) confirms (it) with own eyes.\textquoteright\textquoteright
(5b) 薬で病気を治した。
'o Kusuri-de byooki-o naoshi-ta.
medicine-with sickness-OB cure-Perf
'(I) cured (my) illness by taking the medicine.'

(6a) 年をとると、忘れっぽくなる。
'o Toshio toru to, wasureppoku nar-u.
age gain when forgetful become-Impf
(lit.) 'As (we) get old, (we) become forgetful.'

(6b) 年をとって、忘れっぽくなった。
'o Toshio tot te, wasureppoku nat-ta.
age gain and forgetful become-Perf.
(lit.) 'As (I) got older, (I) have become forgetful.' -> Having become old, I am forgetful'

(7a) 疲れたら、休む。
'o Tsukare-ta-ra, o yasum-u.
tired-Perf-if rest-Impf
'If (one) gets tired, (one should) rest.'

(7b) 疲れたから、休んだ。
'o Tsukare-ta kara, o yasun-da.
tired-Perf because rest-Perf
'Because (I) got tired, (I) had a rest.'

Nominalised clauses can be seen as one type of these generic sentences, in that they often imply generic referents, for example:

(8) 子供の成長を見るのは楽しい。
'Kodomo-no seichoo-o miru-no-wa tanoshii.
child-Gen growth-OB see-Nomz-Top enjoyable
(lit.) 'Seeing a child grow is enjoyable.'

English also has many semantically equivalent generic sentences, like 'Seeing is believing' and 'Clear writing demands clear thinking', where the actor-like subject is not expressed but merely implied as a generic referent. In contrast, sentences such as 'Seeing you leave was sad' is not generic, but specific. In these sentences, the nominalised clause is the subject of the sentence, so that the grammatical subject is present, but the actor of the proposition, an underlying subject, is unexpressed. This issue will be elaborated in §4.6.

---

6 'Da' is an allomorph of 'ta'. 
1.5.1.3 Anaphoric referents

The possible realisations of anaphors in Japanese are basically lexical NPs, pronouns, reflexives and ellipsis. Although lexical NPs are not usually treated as one type of anaphor, there are various types of lexical NPs which are anaphoric.7 Lexical NPs may be demonstrative NPs such as 'ano hito' (that person) and anaphoric NPs such as 'do-sha' (the same/above mentioned company), or a repetition of the same NP, for example;

(9) 学生は佳文を読んでいる。私は心配だった。先生は読み終わると、うまいと言った。
Sensei-wa sakubun-o yondeiru. Watashi-wa shinpai datta.
'the teacher is reading (my) essay. I was anxious. When the teacher finished reading (it), (she) said that (it) was good.'

The second mention of 'sensei' is coreferential with the first mention of the same, and there is no marked meaning involved in the repetition of the NP. In fact, 'sensei' is constantly used anaphorically throughout the text without resorting to other forms of anaphors. Such anaphorically used NPs are commonly address terms, such as kinship terms, titles and personal names, which can be regarded as social pronominals.

In terms of intrasentential anaphors, there are basically three situations which allow repetition, i.e. anaphoric use of full NPs.

Firstly, a generic use of lexical NP, as shown in the following example (see §2.5.1.2, §3.5.2 for the wa/ga distinction):

(10) 子供が三歳に満たない時期に、その状態が続くと、子供は当たり前と思ってしまう。
Kodomo-ga san-saini mitanai jikini, sono jyootai-ga tsuzuku to,
'When a child is less than three years of age and if that environment continues, the child will take it as normal.'
Secondly, Ohso (1976:58) states that a lexical NP can be repeated within a sentence, after an answer to a wh-question:

(11) 誰が食べたの。太郎がそこにいたから、きっと太郎が食べたのよ。

(Wh-question) Dare-ga tabeta-no.

who-SB ate-Q

‘Who ate (it)?’

(Answer) Taro-ga sokoni ita kara, kitto Taro-ga tabeta noyo.

-SB there was because, probably -SB ate Emp

‘Because Taro was there before, probably Taro must have eaten (it).’

Thirdly, a full NP tends to be repeated when an anaphor (the second mention) is the subject but the antecedent (first mention) is non-subject (Kameyama p.c.):

(12) 私が山田を推薦したのは、山田がずばぬけているからだ。

Watashi-ga yamada-o suisenshita no wa, yamada-ga zubanuketeiru kara da.

1sg-SB -OB recommended Nomz Top -SB outstanding because Cop

'The reason why I recommended Yamada is because Yamada is outstanding.'

Next, I consider the reflexive pronoun 'jibun'. This makes no morphological distinction of person and gender, but sometimes of number, as in jibun-tachi (plural) (see Kuno 1973:291, Hinds 1986:116). The antecedent of jibun is the subject, i.e. jibun is coreferential with the subject, as shown below (Kuno 1973, Shibatani 1990, inter alia, see §2.5.2 and §6.4.4). It is well known that although reflexives are clausemates with their antecedents in English, they can be controlled at long distance in Japanese, as in (14) (see §2.3, §2.4.1 and §6.4.4).

(13) ジョンがビルに自分のことを話した。

Johni-ga Bill-ni jibun no koto-o hanashita.

SB IO self Gen matter-OB talked

'John talked to Bill about his matter.'

8 Apart from jibun, there are other reflexive pronouns such as jibunjishin, jishin, jiko, jitai, onore, homin, toonin, ware, mizukara. 'Ji' means 'self', consequently, there are many reflexives with that as the prefix, depending on the selectional restrictions and animacy of the referent and honorificity that the speakers wishes to present (Kameyama 1985:309). The referent of jibun is restricted to human. See Hinds (1986:116) for a list of reflexives with that prefix. In addition, many Sino-Japanese verbs (see §3.1.1) are lexically reflexive predicates with the prefix ji, such as ji-haku-suru 'confess oneself', ji-nin-suru 'admit oneself', and ji-man-suru 'boast oneself'.
Moving on to pronouns more generally, pronouns in Japanese do not exactly parallel those in English, in that one type of Japanese pronoun is anaphoric but others are not. Demonstrative pronouns are anaphoric, for example, 'kore' (this) and 'sore' (that) which refer to the previous word, sentence or paragraph in the text, but they seldom refer to humans (Murata & Nagao 1997). Personal pronouns in Japanese are not generally used anaphorically, particularly intra-sententially. For example, in an English sentence with coreferential subjects such as 'As soon as Hanako came in, she shut the door', or the reverse as in 'As soon as she came in, Hanako shut the door', a personal pronoun is used as the anaphor. Japanese, on the other hand, uses ellipsis for this, and the use of personal pronoun results in a disjoint reading. To illustrate this point, the direct translation of that English sentence into Japanese is shown in (15).

(15) 花子が入ってくるなり、彼女は戸を閉めた。

Hanako-ga haitte kuru nari, kanojo-wa to-o shimeta.

As soon as Hanako came in, she shut the door.'

Although the two NPs in English are coreferential (provided that 'she' is unstressed, Kameyama 1994, see §2.4.1), the Japanese equivalent gives the reading that the two

---

9 Personal pronouns in Japanese sometime flout person, for example, the first person pronoun is used to mean 'you', as shown in the first example, and third person pronoun is used as 'you', as in the second example:

Talking to a little boy on the street who is in tears;

Boku doo shita no.

1sgM what did Q

'What's wrong with you, (little boy),'

Or a man would talk to an unknown woman on the street in a hope for a date:

Kanojo doko iku no.

3sgF where go Q

'Where are you going, Miss?'

There are a number of such examples, but just one more which is also seen in English. Third person pronoun is used to refer to first person in writing by saying Hissawa ... 'The author considers ...'

Hence in such cases of flouting person, even if the referent is overt, it does not work exactly as a means of referent identification. This is not the study of this thesis, and requires future research.
subjects are different. This is because personal pronouns are generally not used anaphorically, particularly intra-sententially in Japanese (see §2.4.1). Interestingly, though, personal pronouns in Japanese can occur without antecedents. In this respect, they function more like deixis or lexical NPs than pronouns.

It is indeed the case that the majority of personal pronouns in Japanese originated as deictics. The third person pronouns have two forms: kare (he) which literally means 'that' and kanojo (she) 'that woman'. In sharp contrast with the third person pronouns and the personal pronouns in English, there are a number of morphologically different forms of first and second pronouns. For example, for second person pronouns, there are anata (over that side), socchi (that side), omae (in front of me), otaku (your residence), and kimi (originally meant 'lord'). All except the last two words are deictics.

The choice of pronoun is pragmatically determined, for example, by the formality of the situation, and the relationship between the speech act participants. Apart from first person pronoun, the use of personal pronouns is often seen as contemptuous or implying a clear line of distance between the speaker and the addressee. Instead, personal names, kinship terms, occupational terms (e.g. nikuya-san 'Mr butcher man', okyaku-san 'customer/visitor'), and titles (e.g. sensei 'teacher/professor/doctor') are preferred. They are often used as vocatives, and the subjects following the vocative are ellipted. When they need to be referred to again, these terms are either repeated or omitted but not usually replaced by personal pronouns, as seen in (9). Another example is in the following dialogue between a teacher and a young student; sensei (teacher) is used as second person by the student and first person by the teacher, but not replaced by personal pronouns. In fact for the student's part, the teacher cannot be referred to by personal pronouns, because

10 The same goes for the reflexive pronoun. One such example was shown in (d) footnote 5.

The same phenomenon is found in English where pronouns in song lyrics can appear without antecedents (Hama 1996). These pronouns are stressed and have marked meaning like the case of Japanese.
personal pronouns imply that the student is placing himself equal or superior to the teacher, which consequently sounds extremely disrespectful.\textsuperscript{11}

(16) 先生、これどう思いますか。先生はこう思うよ。
でも先生はこの前そうじゃないって言ったと思いますが。

Student: \textit{Sensei, kore doo omoi masu ka.}  
teacher, this how think Pol Q
'Mr/s.... what do (you) think about this?'

Teacher: \textit{Sensei-wa koo omoo-yo.}  
teacher-Top this way think-Emp
'I see it this way.'

Student: \textit{Demo sensei/*anata-wa konomae so janait-te itta to omoi masu ga.}  
But teacher/2nd-Top the other day so Neg-Comp said Comp think Pol but
'But (I) think \textbf{you} said the other day that's not right.'

The reasons for only two forms of third person pronouns in contrast with the numerous forms of first and second person in Japanese relate greatly to the history of Japan. Suzuki (1996:116) claims that the Altaic languages, which includes Japanese in his view, did not make gender distinctions in third person pronouns, and that the notion of third person pronouns came into the Japanese language in the late 19th century for the purpose of translating literature from European languages into Japanese (also Yanabu 1982, Yamashita 1986, Fujii 1991). This was the time of the Meiji restoration (1867) when Japan was making an enormous endeavour to modernise its country by absorbing western civilisation, after having secluded itself from foreign contact (except for Dutch and Chinese on one small island) for almost 260 years. Translating European literature into Japanese was one such measure, and the use of third personal pronouns was limited to the world of translated foreign literature. Otherwise, the use of third person pronouns is generally avoided in Japanese, because of their impersonal connotations mentioned above. When third person pronouns are used, they are generally pragmatically marked and conventionalised; for example for third person, 'kare (he)' generally refers to a

\footnotesize\textsuperscript{11} Analogous to the point made in footnote 9, this use of occupational terms rather than anaphors poses a problem in reference-tracking, though it is not a concern for this thesis, as this thesis deals with ellipsis not overt forms of anaphors.
'boyfriend' or a male person with a special relationship and semantic implication, similarly 'kanjo (she)' refers to a particular female, generally 'girlfriend'.\(^{12}\) Hence, kare and kanojo behave like lexical NPs rather than anaphors, particularly intra-sententially.

The anaphoric use of personal pronouns is now, however, becoming prevalent among young people and the literati (Suzuki 1996), and this trend is deemed to have been influenced by the grammar of English and its culture. I was deeply astonished and felt uneasy, when I heard a Japanese man referring to his son as kare. This speaker had lived in the English speaking world for a long time. Even with the increase in the use of third person pronouns, they are not normally used anaphorically, particularly intra-sententially, as shown in (15). Supporting evidence for this view comes from Hinds (1983). He analysed three Japanese texts and investigated which forms of NP are used to maintain topic continuity. The results showed that the use of personal pronouns is infrequent; no pronouns are used in the folktale of Momotaro (written narrative) involving 105 clauses; 6 out of 134 clauses used pronouns in the interview between females; 25 out of 164 clauses used pronouns in the conversation between males. Most of these pronouns are not anaphoric, but used in the same way as lexical NPs.

Thus, apart from the reflexive pronouns, nominal anaphors in Japanese have, roughly speaking, two realisations - lexical NP or ellipsis, whereas in English, there are three: lexical NP, pronoun, and to a much lesser extent ellipsis. Hence, it is easy to deduce that where a referential pronoun is used in English, either a lexical NP or (more generally) ellipsis is used in Japanese (Kuroda 1965, Martin 1975:1075, Kameyama 1985). This is the topic of discussion in §2.5.1.1 and §2.5.2.2.

1.5.2 Location of referent in relation to its ellipsis

\(^{12}\) Similarly, the use of second person pronoun anata is associated with a special implication 'darling' used by a wife to address to her husband, though it can be used in other contexts.
Referents can also be classified in terms of the location of ellipsis in relation to the referent. Accordingly, they are divided into three types of relations: intrasentential, intersentential, and extrasentential. Intrasentential relations occur when ellipsis appears within the same sentence as its referent, so that it mostly occurs in a complex sentence. Intersentential relations occur where ellipsis appears outside the sentence in which its referent appears. Extrasentential relations occur where ellipsis, or an unexpressed argument to be more precise, has no overt mention of its referent in the text, so that the referent must be retrieved situationally or contextually - this is the same as 'exophoric' in Halliday and Hasan's classification (1976). Extrasentential referents are manifested as deictic/indexical referents and generic referents, as discussed in §1.5.1. On the other hand, intrasentential and intersentential referents are anaphoric.

1.6 Statistical aspects

In this section, I examine how frequently ellipsis occurs in actual texts in Japanese.

First, let us consider some figures in the literature. Shibamoto (1983:244) reported that 67.3% (61.3% by male speakers and 73.3% by female speakers) of subjects are ellipted in multiparty conversational interactions, and 54.5% of subjects are ellipted in two interviews about society in Japan. Hinds (1983:59~69) reported that 47.5% of subjects are ellipted in the folktale of Momotaro, 73.9% in interviews between females and 60.4% in interviews between males. Mizutani (1985:59) reported that 77% of subjects are ellipted in discourse among friends and family members. Watanabe (1989:75) reported that 42% of subjects are ellipted in written narratives from primary school textbooks. My examination shows that 56.3% of subjects are ellipted in written narratives and 27.4% of subjects in expository texts (see §1.3 for the detail of texts).13

Nakaiwa et al. (1995:100) reported that only 12.5% of subjects are ellipted, but I do not think this is representative. Their texts are independent sentences, i.e. sentences in isolation and do not form a paragraph or text, taken from a 'variety of texts' which included newspaper articles, conventionalised
Two aspects are apparent by now in relation to these figures. Firstly, all these figures pertain to subject ellipsis, not to other nominal ellipsis. §1.6.2 will argue that this is probably because the great majority of nominal ellipses do involve the subject and non-subject ellipses are infrequent. Chapters 4 and 5 will explain the reasons for the dominance of subject ellipsis. Secondly, the frequency of ellipsis varies considerably and these variations are greatly influenced by the type of texts examined.

The National Language Research Institute of Japan (1955) reports the following rates for subject ellipsis which consider text differences:

Table 2: Rates of ellipted subjects by different genres

<table>
<thead>
<tr>
<th>Genre</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>conversation</td>
<td>74%</td>
</tr>
<tr>
<td>expository such as news and broadcasts</td>
<td>37%</td>
</tr>
<tr>
<td>novels</td>
<td>20%</td>
</tr>
<tr>
<td>English in comparison: type of texts unspecified</td>
<td>2%</td>
</tr>
</tbody>
</table>

[The National Language Research Institute of Japan (1955)]

By taking an overview of the above figures, we can draw a rough generalisation of the rates of subject ellipsis according to the type of texts: over 70% for conversation, 42~56% for narratives, 27~37% for expository texts, and 20% for novels. These differences in the rate of ellipsis are due to differences in the nature of genres. The type of texts forms a scalar relation according to the rate of ellipsis; conversation is the top end of the scale which uses ellipsis most frequently, followed by narratives, expository texts, and novels use ellipsis least frequently. The next subsection looks at more detailed genre differences as well as other types of text differences which influence the frequency of ellipsis and the mechanisms with which to resolve referential identity of ellipsis.

expressions, and conversation. They selected sentences which require no contextual information to make sense, as test sentences for the purpose of their experiment in machine translation systems.

14 It should be noted that where explicitness is required, Japanese does specify references overtly, for example, in legal documents, court hearings, contracts, and to some extent counselling. Legal documents and contracts use technical terms (ko, otu) which are both third person and which do not make differences in person, number or gender.
As a separate but related phenomenon, the case particles and the topic marker are often omitted, resulting in a bare nominal. Because such a nominal can be of any grammatical relation without the marker, its case function (though not the referent) needs to be identified just like nominal ellipsis.\(^{15}\) The National Language Research Institute of Japan (1955) also provides figures for this:

<table>
<thead>
<tr>
<th>Genre</th>
<th>Omitted Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>spoken language</td>
<td>29%</td>
</tr>
<tr>
<td>newspaper</td>
<td>10%</td>
</tr>
<tr>
<td>news</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 3: Rates of omitted particles by different genres

[The National Language Research Institute of Japan, 1955]

Table 3 shows that 29% of particles in spoken language are ellipted. The fact that omitted particles are frequent suggests that whether or not a nominal expression is identified as a subject is determined not merely by the presence of the nominative case marker, but by other linguistic devices, which are the focus of this thesis.

My final comment in this subsection is a comparison with English. Subject ellipsis in English is insignificant at the rate of 2%, as shown in Table 2 (the type of texts here are unknown; see Nariyama 1996). Mizutani (1995:34) reports an interesting and somewhat related issue in examining NHK (a Japanese TV station, which is equivalent of ABC in Australia and BBC in UK) news to see how many phrases (NPs and VPs) it takes before one overt grammatical subject appears. The results were: on average it took 6.5 phrases in Japanese, while in the English translation of the Japanese news it took on average 1.2 phrases, and for non-translated news in English 0.57 phrases.

### 1.6.1 Genre differences in the rate of argument ellipsis

The last section showed that differences in the rate of subject ellipsis are associated with the genre differences between conversation, narratives, expository

\(^{15}\) In some cases, implicit case marking is the unmarked form and explicit case marking makes the sentence inappropriate. Shibatani (1990:368) states that the topic marker is ellipted when the sentence expresses a basic human emotion, for example, *Watashi-ø/*wa samishii. 'I am lonely.'
texts, and novels. I view these differences as being constituted by five interrelated factors: 1) the amount of shared (extra-linguistic) knowledge, 2) the content of the message (e.g. diversity in the topic of message and amount of new information), 3) to whom the message is addressed (directed to a particular addressee or a vast and generalised audience), 4) written or spoken text, and 5) monologue or dialogue. These five factors are examined in this subsection. Note that novels are exceptional, in that they deliberately use third person pronouns for the stylistic and other reasons described in §1.5.1.3. Hence, the rate of ellipsis is the lowest in this genre, but this low rate is not necessarily the product of the five factors mentioned above.

Register and formality may be suggested as further factors. Shibatani (1990:360) states that the level of ellipsis is lower in formal speech than in daily, colloquial speech. In my view, however, his use of the term formality has more to do with the contents of messages than with the register of speech per se. Formal speech generally conveys more complex messages involving more abstract notions and referents, and hence it uses less ellipsis to disambiguate the meaning. If it is purely a matter of formality as register, formal speech will be expected to use more ellipses with the help of honorific codings, since the norm of showing respect in Japanese is to be indirect and unspecific (see §3.3). Hence, the factor of formality can be subsumed in the content of the message.

I now examine in more detail the five interrelated factors that characterise the genre differences which induce differences in rate of ellipsis, the figures for which were presented earlier.

First, genre differences greatly reflect both the amount of shared knowledge and the content of the message. The top end of the scale is conversation, which utilises ellipsis most frequently. In conversation, the amount of shared knowledge tends to be very high among the speech act participants; the closer the relationship of the speech act participants is, the more shared knowledge they have. An extreme example is where a long-married couple can often "read each others' minds" and communicate nonverbally. Therefore, it is plausible to assume that the closer the
relationship between the speech act participants is, the higher the rate of ellipsis will be. The other end of scale is expository texts (approximately 30% of the time) which utilise ellipsis much less than conversation (over 70%) and narratives (approximately 50%). In expository texts compared with conversation, the amount of shared knowledge is small. In addition, the content of the message in expository texts is generally much more complex and abstract, involving more diverse referents (much fewer first and second person referents), and the topics are more diverse, than that in conversation. News is likewise intended to report new information, and shared knowledge plays a diminished role in comprehending such utterances. Consequently, the rate of ellipsis in expository texts is low.

Related to the amount of shared knowledge and the content of the message are two further factors: to whom the message is addressed, and the difference between written language and spoken language. Mizutani (1985) points out that the difference between written language and spoken language is not simply a matter of whether messages are written or spoken, but whether they are targeted to a particular addressee or not. For example, news on radio and TV is verbally delivered, but the type of language has the structure of formal written style. This is because it is verbally read from written materials and is addressed to a vast and generalised audience. News by its nature reports facts in which the speaker has no involvement, hence first and second person pronouns are rarely used unless quoting speeches. Further, news is delivered to a potentially infinite number of listeners where shared knowledge is hardly expected. On the other hand, a letter written to a close friend or a family member often has a similar, if not identical, type of language to conversation. This is despite the fact that it is written. In other words, news is essentially expository texts expressed in spoken language, while a letter to a close friend is colloquial conversation expressed in written language.

Nonetheless, there is also a considerable divergence between written language and spoken language. One of the most salient differences in Japanese is the fact that spoken texts tend to use sentence final particles denoting subjective emotions of the
speaker, whereas written expository texts never do. This divergence is said to have originated in the historical reason that Japanese adopted Chinese characters to write Japanese (Shibatani 1990:357-360, Fujii 1991:6). Because Chinese is radically different from Japanese syntactically and morphologically, written texts have undergone a different path of development from spoken texts (ibid). Even though there have been efforts to bring the two closer, many differences remain.

The prototypical spoken language genre is conversation. Spoken language in conversation often includes errors and ungrammatical elements due to its spontaneous nature. This is because in spoken language there is typically no time to plan and edit so that thinking and speaking are carried out more or less simultaneously. This can induce changes in structure, for example, in word order. Japanese is known to be a strictly verb final language, but non-verb final sentences do occur in conversation (Miyake 1983:292). Spontaneous conversation also includes incomplete sentences due to a number of reasons, such as interruptions, politeness and hesitation (see §1.7.4 for examples). Statistically, Niyekawa (1984:70) reports in analysing a script of television drama that less than one-third of the utterances were complete sentences. Despite the high frequency of incomplete sentences, hearers can rely on phonological cues and extra-linguistic information, such as deixis and visual cues, which are not available to readers. For example, stress plays a major role in interpreting a pronoun as coreferential or disjoint in English complex sentences; a stressed pronoun denotes a disjoint reading, while an unstressed pronoun gets a coreferential reading (see §2.4.1, Kameyama 1994). In addition, spoken texts tend to be simpler in their syntactic structures than written texts. According to Niyekawa (1984:70), 55% of the 527 utterances in 25-minute episode of television drama consisted of fewer than five words; only 5% consisted of more than 25 words. Sentences with just a verbal predicate without any overt arguments often appear in spoken texts, for example, *Mitsuketa* ‘ø found ø’ and *Kita* ‘ø came.’ They are unambiguous and acceptable, because the referents in these sentences can be easily identified by deixis and visual cues. However, these sentences are particular to spoken texts and do not constitute
prototypical sentences. Hence, spoken texts have linguistically very different structural organisation from written texts.

The last factor is the difference between monologue and dialogue. Dialogue is generally observed only in conversation and is rare in other types of texts. What is most different about dialogue with regard to ellipsis is the elliptical use of second person pronoun. In dialogues the unmarked referent for elipted subjects of interrogative is second person, whereas in monologue interrogatives are rare for one thing, and for another the unmarked referent for elipted subjects in interrogatives can be first person.

The following table summarises the factors of genre differences discussed in this subsection. It is arranged according to the frequency of ellipsis for each genre.

**Table 4: Five factors related to genre differences**

<table>
<thead>
<tr>
<th></th>
<th>conversation</th>
<th>narrative</th>
<th>expository</th>
<th>novel</th>
</tr>
</thead>
<tbody>
<tr>
<td>shared knowledge</td>
<td>high</td>
<td>---</td>
<td>low</td>
<td>medium</td>
</tr>
<tr>
<td>content of message</td>
<td>limited</td>
<td>---</td>
<td>diverse/abstract</td>
<td>medium</td>
</tr>
<tr>
<td>to whom the message is addressed</td>
<td>targeted</td>
<td>---</td>
<td>generalised</td>
<td></td>
</tr>
<tr>
<td>spoken/written</td>
<td>spoken</td>
<td>---</td>
<td>written</td>
<td>written</td>
</tr>
<tr>
<td>monologue/dialogue</td>
<td>dialogue</td>
<td>---</td>
<td>monologue</td>
<td>mostly</td>
</tr>
<tr>
<td>frequency of ellipsis</td>
<td>high</td>
<td>---</td>
<td>---</td>
<td>low</td>
</tr>
</tbody>
</table>

The discussion of the five factors which influence the rate of ellipsis in different genres makes it apparent that when describing the type of texts under analysis, it is not precise enough to say 'conversation', or 'written texts', so that more specific description should be provided.

**1.6.2 Predominance of subject ellipsis**

The majority of the figures presented in §1.6.1 pertain to subject ellipsis in particular, but not to other nominal ellipsis. Among the studies presented, only two (Hinds 1983, Shibamoto 1983) noted rates for non-subject ellipses. It is not
coincidental that the majority of the studies only reported subject ellipses, though none of them explained why they examined only subjects; perhaps they were not even aware that this is an issue. In this subsection, I look at rates of ellipsis for non-subject as well as subject, and show that the great majority of ellipsis involves subjects, and provide an explanation for this phenomenon. I present the results from three analyses in the following order: Hinds (1983), Shibamoto (1983), and my own analysis.

Hinds (1983) examined three texts: a written narrative of the folktale 'Momotaro', an interview between females, and a conversation between males. He analysed the texts according to the grammatical relations of subject, object, indirect object, and oblique NPs. Because the occurrence of oblique NPs is low and the rate is insignificant, I will not quote it here. He also considered animacy and provided the results on the basis of whether the NP is animate or inanimate. His results show the following rates for ellipsis. 'N/S' and '?' mean 'not stated' in Hinds. Next to the rate of ellipsis is the actual number of occurrence; '48/101' denotes the number of ellipses under the relevant grammatical relations over total number of occurrence of the relevant grammatical relations, in this case there were 48 subject ellipses out of 101 animate subjects, i.e. the remaining 53 subjects were overt.

<table>
<thead>
<tr>
<th></th>
<th>Momotaro</th>
<th>Interview (females)</th>
<th>Conversation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Animate</td>
<td>Inanimate</td>
</tr>
<tr>
<td>SB ellipsis</td>
<td>48%</td>
<td>50%</td>
<td>85.6%</td>
</tr>
<tr>
<td>OB ellipsis</td>
<td>N/S</td>
<td>?/48</td>
<td>25.0%</td>
</tr>
<tr>
<td>IO ellipsis</td>
<td>N/S</td>
<td>?/32</td>
<td>0</td>
</tr>
</tbody>
</table>

I point out three implications drawn from these results: the predominance of subject ellipsis, the effects of genre difference, and the effects of animate/inanimate distinction on rates of ellipsis. Firstly, subject ellipsis is a lot more frequent than object and indirect object ellipses in terms of rates and number of occurrence, and object ellipsis is more frequent than indirect object ellipsis. In other words, objects
occur much less frequently and they are less likely to be ellipted than subjects, although the ratios of subjects and objects vary according to the texts in Hinds' analysis. The same parallel is found between objects and indirect objects. Secondly, these results confirm what was discussed in §1.6.1 that genre differences make a difference in the rate of ellipsis. The written narrative 'Momotaro' has a lower rate for subject ellipsis than the interview or the conversation, which are both spoken. The differences between the interview and the conversation appear to be mostly due to the differences in gender. The rate of ellipsis in interviews is normally expected to be lower than that in conversation because of the content of messages; generally interviews are more formal (and perhaps diverse) topics than conversation. The figures in Table 5.1, however, show a higher rate of ellipsis in the interview than the conversation. This may be the result of gender differences. Shibamoto (1983) reports from her text analysis that in spoken conversation female speakers tend to use more ellipsis than male speakers, because female speakers tend to refer to the same topic for longer. Thirdly, the difference between animate and inanimate referents in the rates of ellipsis is significant in terms of subject ellipsis (the occurrence of object and indirect object ellipses is too infrequent to draw a generalisation), except for Momotaro. That is to say, animate subjects are more prone to be ellipted than inanimate subjects are. Reasons for this are offered in Chapter 5 in the introduction of the principle of argument ellipsis.

Further, the frequency of occurrence shows that inanimate subjects are less likely to be expressed as the subject, particularly in the written narrative text Momotaro. On the contrary, the object is a lot more likely to be inanimate than animate. Reason for these outcomes is explained in Chapter 5 in the discussion of the principle of direct alignment. This difference between animate and inanimate ellipsis

---

16 A similar parallel exists in English, in that the subject can be ellipted but not always the object. 'I met Mary and Øi told her ...'

17 It is uncertain as to whether or not the result from Momotaro should be treated as exceptional, since there is no comparable analysis found.
only applies to subject ellipsis, and the figures for object and indirect ellipses are too sporadic to draw a generalisation.

Shibamoto (1983:237) examined an interview with a focus on gender difference. However, since the result shows a relatively insignificant gender difference and since difference in gender is not a concern for this thesis, I present the average figures here for simplicity. Her results were that 64% of subjects are ellipted and 41.6% of objects are ellipted. The actual numbers of occurrence are not provided by her.

My corpus consists of five written narrative texts from three written expository texts drawn from “Nihon shakai saikoo” (Japanese society: An update, 1991) and PHP magazines (see §1.3 for details). The results are as follows, and the results from Shibamoto are incorporated here for comparison, with the Hinds' results also repeated here for convenience:

| Table 5.2: Rates of ellipsis (Nariyama 1999, Shibamoto 1983) |
|---------------------------------|-----------------|-----------------|
| **expository**                  | **written narrative** | **interview** |
| **(Nihon shakai saikoo)**      | **(PHP)**        | (Shibamoto)     |
| subject ellipsis                | 27.4% 23/84      | 56.3% 179/318   | 64% N/S |
| object ellipsis                 | 16.7% 4/24       | 11.1% 10/90     | 41.6% N/S |

<table>
<thead>
<tr>
<th>Table 5.1: Rates of ellipsis (Hinds 1983)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Momotaro</strong></td>
</tr>
<tr>
<td><strong>Interview</strong> (females)</td>
</tr>
<tr>
<td><strong>Conversation</strong> (males)</td>
</tr>
<tr>
<td>[Animate] [Inanimate]</td>
</tr>
<tr>
<td>[Animate] [Inanimate] [Animate] [Inanimate] [Animate] [Inanimate]</td>
</tr>
<tr>
<td>SB ellipsis 48% 48/101 50% 2/4 85.6% 83/97 43.2% 16/37 65.4% 83/127 43.2% 16/37</td>
</tr>
<tr>
<td>OB ellipsis N/S ?/48 N/S ?/19 25.0% 1/4 26.7% 8/38 0 0/10 33.3% 8/24</td>
</tr>
<tr>
<td>IO ellipsis N/S ?/32 N/S ?/4 0 0/1 0 0 87.5% 7/8 0 0/3</td>
</tr>
</tbody>
</table>

The results from the three studies show basically the same trend.

Firstly, subject ellipsis is a lot more frequent than object ellipsis in terms of both rates and number of total occurrence (i.e. whether ellipted or not). In other words, objects occur much less frequently than subjects in number, and the proportion for object ellipsis is lower than that for subject ellipsis. Although in
Hinds' texts, the ratio of subjects and objects varies according to the texts, in my texts, the ratio for both texts are strikingly similar, in that subjects appear 3.5 times more frequently than objects. Shibamoto's results cannot be compared, since she did not provide the actual numbers of occurrence.

Secondly, these results again confirm that genre differences exist - nominal ellipsis is more frequent in conversation than in expository texts and written narrative. The differences between expository texts and written narrative cannot be drawn from the above data, because only one study analysed expository texts. Analogously, the difference between animate and inanimate referents in the rates of ellipsis cannot be drawn out, because Shibamoto's and my analysis did not take it into account.

Recapitulating the findings of the three studies, subject argument positions appear a lot more frequently than objects, and subjects are more likely to be ellipted than objects in ratio. The former aspect is only natural considering that almost every sentence has a subject, but not all sentences contain an object. An important question for this thesis, which has not been considered in the literature, is why subjects should be more prone to ellipsis than non-subjects, and to such an extent. This question will be answered in Chapter 5, when the principle of argument ellipsis is proposed.

---

18 In the study of second language acquisition, though the researchers' interests are different from this study, some works have considered the fact, that objects have been overlooked perhaps as the result of the subject's conspicuousness in many respects. Yuan (1997) found an asymmetry in that Chinese learners of English have much more difficulty in spotting ungrammatically placed null objects than null subjects in English in a grammaticality judgement task. Ojima (1998) found the same asymmetry in Japanese learners of English.

If my findings are correct that objects are less prone to ellipsis than subjects are, why did those learners find spotting incorrect object ellipses harder than subjects? I suspect that two interrelated reasons are responsible for this fact. One reason is that when an English transitive sentence is translated into Japanese (only Japanese is referred to here), the Japanese translation can be intransitive (discussed in §4.5), so that the object does not exist in the Japanese translation. The other reason is that even though ellipsis is prevalent in Japanese, the Japanese learners of English are aware that the subject in English must be overt, so that they are more conscious about making the subject overt (Ojima 1998). On the other hand, the object appears only in a transitive sentence, so that missing objects are easily overlooked, especially on the grounds that the transitivity distinction is not morphologically marked in English verbs, whereas in Japanese it is for the majority of verbs (see §3.1.1). Perhaps this may be also due to the fact that the subject appears first in the sentence, so that it is easier to pay attention to the subject than the object which comes later in the English sentence.
1.7  **Motivations for the use of argument ellipsis**

In this section, I take a few perspectives on the two questions of why ellipsis frequently appears and what enables the frequent use of ellipsis in Japanese: the typological significance of ellipsis in §1.7.1, diachronic aspects in §1.7.2, synchronic aspects in §1.7.3, and possible cultural motivations in §1.7.4.

1.7.1  **Argument ellipsis for efficiency**

Van Valin (1987:513) makes the following claim in relation to anaphora:

> Someone might imagine that a language could simply repeat a noun or NP to refer to the same referent, but this is not found in any human language, because it would be terribly redundant and inefficient.

In other words, the use of reduced forms is universally more efficient. While other effects such as discourse coherency may be attained through the use of anaphora, I focus my attention on the effect of efficiency in this subsection.

Givon (1979:220) states a cost in the use of anaphors — language loses message transparency, while it gains processing speed. This may be true of what he was referring to (a pronoun can possibly refer to two different referents), and may be theoretically plausible particularly from a sentence level perspective. However, generally, anaphora has the opposite effect to what Givon claims, as shown by the following intriguing report.

Yokokawa (1996) examined the correlation between the use of ellipsis and the presence of context from the perspective of language processing (the type of texts is unspecified). He showed that when there is no context, it takes longer to process and understand a sentence with an ellipted argument (takes 775 ms) than a sentence with no ellipted argument (659 ms) (Yokokawa 1996:287). This supports Givon's claim. However, in reality, sentences will be less likely to include ellipsis if there is no context. As a number of studies have argued, the speaker selects a form of anaphor on the basis of their assumption that the addressee has sufficient background knowledge to understand what the speaker is saying (Du Bois 1980, Chafe 1987,
Gundel et al 1993, inter alia). Watanabe (1989:130-1) has shown in analysing school texts that the rate of ellipted subject participants representing old information was 100% (§2.5.1.2). Hence, unless the speaker can assume there is sufficient context for the addressee to retrieve the referent, he is unlikely to select ellipsis. The situation of sentences with ellipsis but no context was analysed in Yokokawa's test, because, I presume, it is an experiment which is bound to test all possibilities in search for outcomes and their factors.

On the other hand, more importantly, Yokokawa (1996:287) reports that when there is a context which provides the referential identity of ellipsis, a sentence with ellipsis (545 ms) takes less time to process than a sentence with no ellipsis (565 ms). This result confirms that it is indeed more cost effective to use ellipsis, when there is a context. This may also apply to other forms of anaphors which are shorter referring expressions than full NPs. The result, thus, refutes Givon's claim that language loses message transparency by resorting to anaphors. On the contrary, when a referent is made overt where ellipsis is expected, it gives marked implicatures or creates puzzles for interpretation, as will be exemplified in (17c) later in this subsection. The use of ellipsis for efficiency is true not only in terms of sentence processing, which is the interest of Yokokawa's analysis, but also true in terms of production, naturally because the form is shorter.

The use of ellipsis for efficiency is also supported by pragmatic theories explaining the mechanisms of conversation. Grice (1975) proposed his well-known pragmatic theory, which captures an underlying principle that determines the way in which language is used with maximal efficiency and effectiveness to achieve rational interaction in communication (see §2.4.1). This theory is expressed in 'the cooperative principle' and 'maxims of conversation' — do not make your contribution more informative than is required (The maxim of quantity). A similar observation is made by Sperber and Wilson (1986) on speech acts, called ‘optimal relevance’ - the presumption that the utterance will have adequate contextual effects for the minimum necessary processing. That is to say, Sperber and Wilson make the same claim as
Grice does but from a different perspective: Sperber and Wilson in relation to language processing and Grice in relation to production.

Grice also accounts for cases where sentences contain a redundant expression, i.e. they flout the maxim of efficiency. This gives rise to different implicatures, such as emphasis and contrast. For example, the unmarked answer for the question (17a) is (17b) where the subject, referential/understood referent, is ellipted in Japanese. Overt expressions of the subject give special implications. The **wa**-marked subject of (17c) gives a contrastive implication 'I'm going, (but others are not)', while the **ga**-marked subject of (17d) gives an exhaustive reading 'I'm the one who is going' (Kuno 1973, see §3.5.2 and §6.4).

(17a) あなたは明日行きますか。

_anata-wa ashita ikimasu ka._

2sg-Top tomorrow go Q

'Are you going tomorrow?'

[unmarked]

(17b) はい、行きます。

_Hai, o ikimasu._

yes going

'Yes, (I'm) going.'

[marked] - conveying special implications

(17c) はい、私は行きます。

_Hai, watashi-wa ikimasu._

yes I-Topic going

'Yes, I'm going, (but others are not).' [Contrast]

(17d) はい、私が行きます。

*_Hai, watashi-ga ikimasu._

yes I-SB going

'Yes, I'm the one who is going.' [Exhaustive]

Notice that (17d) 'Yes, I'm the one who is going.' is inappropriate and unacceptable as an answer to the question (17a) 'Are you going tomorrow?', as is the case in English. Thus, when the use of ellipsis is expected, overt expressions can not only give rise to different implicatures, as in (17c), but also it can be unacceptable, as in (17d).

The theories of Grice and Sperber & Wilson also suggest that the notion of 'a shorter form for efficiency' is not restricted to ellipsis, but it extends to subsume various aspects of grammar which correlate with the mechanisms of ellipsis, namely
'less number of rules for efficiency'. Efficiency demands a minimum number of grammatical rules necessary to achieve communicative competence (a ‘linguistic mechanism of relativity’ so to speak). In other words, there seems to be a language mechanism that has the tendency to organise overall operations of language in such a way as to retain communicative function with minimum processing effort. I substantiate this correlation diachronically in §1.7.2, and synchronically in §1.7.3. Of course, this correlation is only a tendency, and language does have aspects of redundancy; Durie calls it 'Functional overkill' (1995:277-9). I have discussed the repetitive use of lexical NPs in Japanese in §1.5.1.3, and this is one such example.

1.7.2 Diachronic aspects

The use of ellipsis has decreased over time, even though it is still very frequent in modern Japanese, as shown statistically in §1.6. In this subsection, I examine the decrease in the use of ellipsis over time in Japanese, and consider factors responsible for it.

Fujii (1991) studied diachronic changes in the occurrence of subject ellipsis by examining a group of eight written texts. One is a piece of classical literature, Genji monogatari (The tale of Genji), written in the 11th century. This text is considered to be the supreme masterpiece of Japanese prose literature and has enjoyed a number of colloquial translations at various periods. Fujii examined this original text and seven translations in rather more recent periods, and reported the percentage of ellipted subjects as follows:

Table 6.1: Changes in the proportion of ellipted subject (The tale of Genji)

<table>
<thead>
<tr>
<th>year of publication:</th>
<th>original (11c)</th>
<th>1723</th>
<th>1830</th>
<th>1914</th>
<th>1936</th>
<th>1959</th>
<th>1972</th>
<th>1978</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of ø subject:</td>
<td>69.25%</td>
<td>66.0</td>
<td>57.0</td>
<td>41.2</td>
<td>46.75</td>
<td>68.5</td>
<td>64.3</td>
<td>58.0</td>
</tr>
</tbody>
</table>
The rates for ellipsis continued to decline from the original text in the 11th century, except for two publications in 1936 and 1959. After the consecutive periods in the decline of rates, the rate in 1936 suddenly rose and in 1959 it rapidly rose almost to the original rate, then the rates started to decline again thereafter. Fujii (1991:74-5) suggests that the period between 1910 and 1940, when subjects were more explicitly stated, coincides with a time when the influence of Western languages was strongly felt in many areas of the language. After this increase in the trend of expressing subjects overtly, there was a mixed trend reflecting the western influence (i.e. overt expression) and the writer's aesthetic taste which is to archaise the style of writing to create a sense of reading classical literature (i.e. more ellipsis).

As mentioned in §1.6.1, novels involve writers' conscious efforts to manipulate the style of writing for an effect. Genji Monogatari and its series of translations, therefore, doubtlessly include some variables attributable to novelistic style, and hence they are not the most ideal texts. Nonetheless, examining an original text and its translations is an excellent way of investigating diachronic changes in subject ellipsis, since such a comparison is not available in other types of texts; examining different stories at different periods would not capture the phenomenon as accurately as examining the same story at different periods. Above all, the overall
trend in the rates of subject ellipsis clearly shows the decline in the use of ellipsis over time: 69% in the 11th century (the original) versus 58% in 1978 (the most recent publication).

In order to account for variables attributed to novels in examining *Genji Monogatari*, another set of texts was examined for the same purpose, that is, primary school textbooks at various times (Fujii 1991:74-5). The results of the rates of ellipted subjects are as follows:

**Table 6.2: Changes in the proportion of ellipted subject** (school texts)

<table>
<thead>
<tr>
<th>Year</th>
<th>1875</th>
<th>1900</th>
<th>1936</th>
</tr>
</thead>
<tbody>
<tr>
<td>no. of clauses</td>
<td>150</td>
<td>171</td>
<td>165</td>
</tr>
<tr>
<td>% of ø subjects</td>
<td>57.3%</td>
<td>57.9%</td>
<td>41.8%</td>
</tr>
</tbody>
</table>

Again, the result clearly shows that the overall rates of subject ellipsis have decreased. Note that the rise in the rate of subject ellipsis observed for *Genji monogatari* in 1936 was not shown in school texts, which were presumably exempt from archaising novelistic styles. Although there is a slight increase in 1900 and only three periods are examined, the overall trend shows a decline of rates into 1936. Unfortunately, Fujii did not examine more school texts of later years corresponding to those of *Genji monogatari*.

The factor responsible for the overall decrease in rate of subject ellipsis seems to be attributed to efficiency. The subject was more implicit in old Japanese than in modern Japanese, but old Japanese was equipped with more means to indicate the subject implicitly, for example, by more elaborate honorifics (Sansom 1968:76-7, Moeran 1988:441, Fujii 1991:147) and switch-reference markings (Akiba 1977, Fujii 1991:147, see §3.5). Furthermore, according to Ema et al. (1977), the nominative marker *ga* was originally the genitive marker, but it started to be used as the nominative approximately in the 13th century. Eventually the nominative case function became dominant and finally the genitive case function was lost. Today, a few set phrases, such as *wa-ga kuni* (my country), remain, leaving a sign of the
bygone function of *ga* associated with the archaic connotation deriving from such phrases. Prior to the introduction of the nominative marker, the subject was expressed either by ellipsis or by bare nominals without case marking (see §1.7.4 for examples) or with emphatic particles, such as *wa, mo* and *zo*. In addition, as mentioned in §1.5.1.3, personal pronouns were introduced in the 19th century, initially to be used in the translation of western literatures, but eventually the domain of their use was extended. Furthermore, verb conjugations were more complex; in old Japanese there were two inflections representing past tense; *ki* is used for describing the speaker’s own experience of the past event, and *keri* for the speaker’s hearsay knowledge of the event; as well as four inflections representing perfective aspect of different kinds, such as the subject's volition (Ema et al. 1977). These differentiations restricted, and hence signalled, what could be the subject of the sentence. In modern Japanese, these six inflections of tense and aspect have disappeared and been neutralised into just the one form *ta*.

Thus, it is plausible to assume that these new usages of the nominative marker and personal pronouns, i.e. more overt expression of the subject and less use of ellipsis, correlates with reduction in the role of elaborate honorifics, switch-reference, and verb conjugations, in identifying the referents of ellipsis. I take no stance on the question of whether the new entities took over existing functions, or whether existing functions were lost along with the emergence of new entities. Since both new and old mechanisms contribute to the function of referent identification, it would be redundant to retain both, notwithstanding that there are other functions attributed to the old mechanisms. Hence, this phenomenon of diachronic changes can be interpreted as balancing out mechanisms for efficiency, and it parallels the effect observed earlier in the use of ellipsis for avoiding repetitions for efficiency.

### 1.7.3 Synchronic aspects

The balance of mechanisms for efficiency is also observed synchronically. When the case function of a referent is obvious, case marking is often omitted
particularly in conversation, as statistically shown in §1.6.1. This does not usually cause ambiguity, because using the earlier argument (by Du Bois 1980, Chafe 1987, Gundel et al. 1993), the case marking is ellipted only when the speaker assumes that the addressee can understand the speaker's utterance without case marking. Analogous phenomena are also observed cross-linguistically. It is common to omit free NPs in cross-referencing languages, and to skip case markings for obvious referents (Mallinson & Blake 1981:63). For example, a number of languages tend to employ no marking unless there is an ambiguity; for example, in Altaic languages (e.g. Turkish) and Indo-Iranian languages (e.g. Hindi, Nepali, Baluchi), objects are marked only when there is confusion as to which noun phrase is the agent, for example, where two referents are both animate and definite (Dixon 1980:490, Shibatani 1990:348).  

These examples illustrate that case marking mechanisms can be skipped, when the same understanding can be achieved without them, paralleling argument ellipsis. Thus, it is plausible to assume that language has a tendency to organise its mechanisms in such a way as to retain communicative function with minimum processing effort, namely to be efficient by avoiding duplications and redundancy, 'functional overkill' notwithstanding. The concept of markedness seems to have its basis in this (see §6.4).

A further area of interest is what enables ellipsis to be so pervasive in Japanese, while in English ellipsis is very restricted. One of the reasons for this difference may be to do with differences in morpho-syntax. In written English, ellipsis is permitted only for the subject in restricted structures of adverbial clauses, gerundive clauses, prepositional phrases, and coordinate structures. These subjectless sentences all occur in complex sentences most of which are non-finite, and none in simple sentences, except in conversation (Nariyama 1996). The most frequent and

---

19 There are more examples of such phenomena. In Murinypata, markers are used for a sentence involving two entities of the same noun class (i.e. number, gender, person, and definiteness) (Dixon 1980:490). The ergative marker is used only when agent and patient are not distinguishable by cross-referencing (Mallinson & Blake 1981).
obvious examples of subjectless sentences in English are imperatives. For this reason, any subjectless simple sentence is prone to be interpreted as an imperative, for example, ‘Ø think’ cannot be interpreted as ‘I think / He thinks’, but as imperative ‘You think.’ I view this as one of the factors which disallow or discourage English sentences to elide subjects.\(^\text{20}\) On the other hand in Japanese, imperative constructions are formed by an imperative morpheme suffixed on the verb,\(^\text{21}\) and lack of subject on the surface cannot be interpreted as imperative or otherwise, as shown below:

\[
\begin{array}{ll}
\text{(18a) Imperative} & \text{(18b) Affirmative without subject} \\
\text{考えろ。} & \text{考えろ。} \\
\text{Ø kangae- \text{-ro}} & \text{Ø Kangae- \text{-ru}} \\
\text{SB think-Imperative} & \text{SB think-Affirmative} \\
'(You) think (about it).' & '(I) think (about it).'
\end{array}
\]

Hence, the fact that ellipsis is allowed freely in Japanese seems to correlate with the fact that subjectless sentences are not conditioned morpho-syntactically, because they will not be seen as imperative or other constructions. In English, on the other hand, the subjectless sentences will be easily seen as imperative, apart from some conventionalised expressions, hence it seems reasonable to assume that restriction on subject ellipsis has a correlation with avoiding confusion in the meaning.\(^\text{22}\)

### 1.7.4 Cultural motivations

Finally, let us consider some cultural elements which may be of relevance to the frequent use of ellipsis in Japanese. The relationship between language and culture has been a strong interest for linguists as well as scholars of other disciplines for many decades. While the interaction between language and culture cannot be denied, linguistic determinism, i.e. the argument over whether or not one influences

\(^{20}\) Nonetheless, there are exceptions when such sentences are conventionalised, for instance, ‘Sorry’ being ‘I’m sorry.’ and ‘Thank you’ being ‘I thank you.’

\(^{21}\) Chapter 3 will describe how verbal predicates in Japanese can contain a number of morphemes which provide argument-inferring information.

\(^{22}\) In addition, it seems to me that conjunctions are used more frequently in Japanese than in English. Conjunctions in Japanese often signal the topic continuity, so that they indicate the same subject or different subject which helps the referential identification. See §3.5.1 conjunctive particles.
the other, and if so which influences which, has been controversial. Some may argue that language is embedded in culture (Shibatani 1990:392), while others may argue the opposite. One strong statement of the latter case was made by Sapir and his student Whorf in the well-known 'Sapir-Whorf Hypothesis' (Sapir 1929, Whorf 1940, Lucy 1992). It argues that differences between languages influence the ways people think - perhaps the ways in which whole cultures are organised. It is not my intention to support or argue against linguistic determinism here. My intention is to list some aspects of Japanese culture which are of relevance to the use of ellipsis. These aspects suggest that Japanese culture values subtlety, hence indirectness in language expressions, and this may be one of the factors which motivates the frequent use of ellipsis.

Japanese haiku poetry may be the ultimate example of subtlety, indirectness and ellipsis. It is one of the shortest types of poems in the world; each consists of a mere 17 morae. 'Haiku' literally means 'performing phrases', and indeed it is comprised with a few phrases. The subject is frequently implicit in haiku, as shown in (19). Even when there is a subject, it seldom displays the nominative case marking, i.e. a bare nominal is used (see §1.7.2), as shown in (20):

(19) 三千の俳句を閲し、柿二つ。

 Verb 'After (I)'d pored over 3000 haiku, (I earned) two persimmons.

Haiku poem by Masaoka Shiki (1867-1902)

(20) 古池や蛙飛び込む水の音

Verb 'The old pond; a frog dives in, and the sound of water.'

Haiku poem by Matsuo Basho (1644-1694)

Another such instance is unfinished sentences, which occur very frequently in conversation. As discussed in §1.6.1, more than two-thirds of the utterances in analysing a script of television drama were incomplete sentences. This incompleteness is also often taken to be a sign of politeness (see Brown and Levinson
1987). For example, the following represents a typical conversation between a host and a guest, in a situation when a guest is about to leave. All the sentences lack main clauses (see Buscha 1976 for main clause ellipsis), and this is a sign of politeness which avoids a direct expression of the speaker's intention in order to reduce a cost to the other party. Notice that in (21a) the guest does not express his intention of leaving, but in (21c) he does, because that statement reduces the cost to the host of preparing a cup of tea for him. The intended meanings of the matrix clauses are shown in the brackets.

(21a) Guest: *Soro soro jikan desu kara, ...*. そろそろ時間がですから。
soon time Cop[Pol] because,
'Because (it) is about time, (I need to leave here now.)'

(21b) Host: *Ima ø ocha-o ire masu kara, ...*. 今お茶を入れますから。
now SB tea-OB make Pol because,
'Because (I am) just about making a cup of tea, (please stay on.)'

(21c) Guest: *Sugu ø shitsureshi masu kara, ...*. すぐ失礼しますから。
right away SB excuse oneself Pol because,
'Because (I am) leaving right away, (please don't bother making the tea for me.)'

Honorification is another phenomenon which enforces indirectness of linguistic expressions probably to the highest extent by the abundant use of nominal ellipsis and the neutralisation of verbs (see §3.3). For example, an honorific verb *irassharu* can correspond to any one of three semantically very different verbs: come, go, and stay/exist, even though there exist separate verbs for non-honorifics: *kuru*, *iku*, and *iru/aru* respectively.

Shibatani (1990:389-390) succinctly and fully captures the relation between the preference for indirect expressions and Japanese culture. The rest of this paragraph summarizes his points. Japanese, following the Confucian tradition, emphasises deeds over words. The European tradition of eloquence and persuasion by means of linguistic skills has not been one of the virtues cultivated in Japan, in fact, it has largely been discouraged. Instead, indirect transmission of the intended meaning is favoured. It is the addressee's ability to arrive at an intended conclusion rather than the persuader's logical presentation that is evaluated. Thus, one who does...
not get the point by merely hearing hints is considered a dull person. Japanese
emphasises a vagueness that invites the addressee to search for answers, whereas
European languages emphasise clarity that leaves no room for the addressee to
wonder.

This cultural value of indirectness is manifested in the earlier examples of
*haiku*, unfinished sentences and honorification; namely, it is consistent with the way
in which mechanisms of the Japanese language operate. Chapters 3, 4 and 5 will
show that direct mechanisms, such as pronouns and clitics used in cross-referencing
and agreement which constitutes a one-to-one mapping relation between an anaphor
and its referent expressed morphologically, are not utilised in Japanese; instead more
indirect mechanisms, such as the portmanteau use of epistemic morphemes which
helps to determine the identity of ellipted argument (§3.4) and readings drawn from
argument structures (Chapters 4 and 5), are used.

The Japanese cultural emphasis on group orientation (selflessness and
harmony) in creating a sense of community, rather than individualism, is also
profoundly woven into the Japanese language. This preference for group identity, not
only encourages the use of ellipsis or social terms instead of personal pronouns, but
also induces the notion of in-group and out-group which governs referential terms,
beneactive (donatory) verbs (§3.2), and honorifics (§3.3), all of which provide cues
to referent identification.

The sense of selflessness and group orientation leads to another phenomenon
which also induces ellipsis in subtle ways. A number of Japanese linguists (Ikegami
1981, Anzai 1983, Hinds & Nishimitsu 1986, Nakajima 1987, inter alia) have pointed
out the differences in how Japanese and English describe a situation/event (though in
§5.6 I will offer a drastically different view). Japanese structures sentences in such a
way as to focus on a situation/event, hence orienting the verbal predicate as the focus
of the sentence (static, centripetal). This skews sentence structure towards
intransitive, which connotes spontaneity and de-stresses the cause-effect (agent and
patient) relation. In other words, instead of using a transitive sentence with an
ellipted subject, an intransitive sentence is used, whereby the subject does not even exist in the underlying structure. For example, when one first encounters an event such as the following, Japanese prefers to use an intransitive structure, describing an event as in (22a), rather than using a transitive describing who lost it, as in (22b). The use of passive sentences, as in (22c), which presupposes the agent, is dispreferred, because it accuses the unknown agent and therefore is rude.

(22a) 財布がない。
Saifu-ga nai.
(wallet-SB Neg)
'(The/my) wallet is not here. -->(The/my) wallet has gone.'

(22b) 財布をなくした。
 ø Saifu-o nakushi-ta.
(wallet-OB lose-Past)
'(I) lost (my) wallet.'

(22c) 財布をとられた。
 ø ø Saifu-o to-rare-ta.
(wallet-OB lose-Past)
'(My) wallet was stolen.'

On the other hand, English tends to orient sentences to describe a situation/event with actor/human as the focus (dynamic, centrifugal). This skews sentence structure towards transitive which presupposes an agent/patient relation. Ikegami (1981) calls the former a 'become-language', and the latter a 'do-language'. Even though English may also prefer the expression using intransitive for the event described in (22a,b), in the following set of examples, the difference is clearly seen; Japanese sentences are intransitive, whereas the English equivalents are expressed using a transitive:

(23) (私は) 子供がいる。
(Watashi-wa) kodomo-ga iru.
1sg-Top child-SB exist
'(lit.) (For me), there exists a child. -->(I have a child.)

(24) (あなたは) 何に興味がありますか。
(Anata-wa) nani ni kyoumi-ga ari masu ka.
2sg-Top what-by interest-SB exist Pol Q
'(lit.) (As for you), what sort of interest is there? -->(What interests you?)

§4.5.2 will argue that passive in Japanese is basically transitive, in that it can take an object and the verbal morphology is transitive (see also §3.1).
In both examples, Japanese expresses the proposition with an intransitive sentence, with the underlying actor/possessor expressed by an oblique argument or topic, which is often ellipted, and the underlying experiencer expressed by the nominative (i.e. 'child' and 'interest'). On the other hand, English expresses the proposition with a transitive sentence. Even though such English sentences are not high in transitivity semantically (Hopper and Thompson 1980), syntactically they are definitely transitive.

Intransitive sentences typically show low transitivity and low evidentiality (often irrealis) with a less volitional agent and a non-individualised patient (Hopper and Thompson 1980, Watanabe 1984:236-240). In other words, intransitive sentences do not display or highlight agent/patient relation of the two referents, but their focus is more on the description of an event. §4.6.1 will show statistically that Japanese uses intransitive sentences more often than English does based on the comparison between Japanese sentences and the English translation of them. This subtlety is not due to the uncertainty of the agent/patient relationship of the referents, but rather is due to its culture of valuing indirectness for politeness.

Japanese intransitive sentences of this type have a problematic feature. When the possessor is ellipted, as is often the case, for example as in (23), *kodomo-ga iru* 'there is a child', because this sentence is intransitive and has a subject, it is syntactically a complete sentence. From an analytical point of view, it is unclear whether the oblique possessor has been ellipted (i.e. talking about someone's child), or it did not exist in the first place (i.e. talking about the existence of an unknown child before the speaker's eyes). Hence, it is indeed very indirect that the underlying actor/possessor is expressed by an oblique or ellipted, using an intransitive sentence. This raises another question. Even when an intransitive sentence seemingly contains no ellipted element syntactically, it may well have an underlying possessor/actor, in

---

24 Head-final languages (like Japanese) usually lack a verb corresponding to have in possessive constructions (Freeze 1992).

25 Du Bois (1985, 1987) discusses this pattern of the use of intransitive sentences as 'preferred argument structure' from a discourse perspective (see §5.1).
which case, the underlying ellided possessor/actor needs to be identified, if it was to be translated into grammatical English. This is the topic of discussion elaborated in §4.6.1 and §5.1.1 under 'low-transitive sentences', and §6.3, §7.1 and §7.2.2.3 for the treatment of referent identification.

1.8 Indirectness of the Japanese mechanisms for referent identification

I have presented various phenomena concerning ellipsis from different perspectives and the Japanese preference for indirectness. In doing so, I adumbrated how this indirectness is also reflected in the mechanisms used for referent identification. The reader may feel at this point an apparent contradiction between the functional accounts and the Japanese cultural preference to indirect expressions. So I clarify my contention here.

In §1.7.1~3, I presented functional accounts which tend to assume that all languages have equally well-adapted systems for retrieving referents. I discussed this in two dimensions. Diachronically within a language a diminution of one reference-tracking system (switch-reference and honorifics in Japanese) will be compensated for by strengthening of other or new systems (less implicit coding of arguments and emergence of the nominative marker in Japanese). Synchronically, in any language the combination of the various mechanisms is taken to result in an optimally-adapted system for retrieving referents. This is where the cultural preference comes into play; that is, what determines the choice of mechanisms to achieve the same function may reflect the cultural and social preference of the language users. Japanese culture, with the high value it places on indirectness, as discussed in §1.7.4, agrees with a less-than-explicit system for representing reference (i.e. the use of ellipsis), which, I shall show in Part 2, is also reflected in the type of mechanisms used for referent identification. The primary assumption of functional grammar is that language has cognitive and social functions which play a central role in determining the structures and systems that linguists think of as the grammar of a language (Thompson
Functional accounts are in essence based on a pragmatic view of language as social interaction (Crystal 1992:148) in which culture plays a role.

Finally, the indirectness seen in the mechanisms used in Japanese is by no means 'vague', as has been perceived by some non-native speakers of Japanese. They are just different mechanisms. Although ellipted arguments have no morphological form, they leave traces of their identity on the overt part of the sentence through various pieces of linguistic information, which results in the same understanding of the meaning of sentences as those more direct mechanisms such as cross-referencing systems and overt coding of arguments. This is fully explained in Part 2.
Chapter 2  Literature review on anaphora

Since ellipsis is only one type of anaphor and there are many more studies done on other types of anaphors than on ellipsis, I will begin my review of the literature with an overview of anaphora generally, then develop my discussion towards the more specific area of ellipsis in Japanese.

Studies of anaphora truly began in the 1980s and formed an important base for today's research into this topic. Studies of anaphora have been conducted mainly in two areas of linguistics: discourse/pragmatics and syntactically oriented generative grammar. The studies of anaphora are about explicating the relation between an anaphor and its referent, whether the anaphor is found within the same sentence as its referent (a syntactic issue) or in another sentence (a pragmatic issue). Therefore, syntax and pragmatics are indeed the key areas of linguistics to be investigated for anaphora resolution. Both of these areas are reviewed in this chapter.

2.1  Discourse approaches to reference-tracking systems

The predominant focus of discourse approaches has been on resolving pronominal anaphora, particularly of English, and on understanding the choice between pronouns and lexical NPs (e.g. Du Bois 1980, Brown & Yule 1983, Fox 1986,1987,1996, Shiffrin 1994). However, anaphora in other languages has not been explored to the same extent as for English. This is even more the case for studies of argument ellipsis, since this is not much of an issue in English.

One notable study of anaphora with regard to cross-linguistic considerations is the collective study of ‘topic continuity’ led by Givón (ed. 1983). This study looks at a number of languages including Japanese, and it truly examines discourse, not just a few sequences of sentences, as it is often the case with other studies. Hinds (1983) and Watanabe (1989) examined the phenomena of ellipsis in Japanese within this framework, and their works are reviewed in §2.5.1. Such studies of topic continuity argue that the recency of last mention associated with topic determines the form of
anaphor chosen, so that high topic referents tend to be coded by pronoun (or ellipsis in the case of Japanese), whereas low topic referents tend to be coded by full NPs. Levinson (1987, 1991) also discusses what determines the referential choice. While the study of topic continuity is more quantitative and empirical, Levinson offers more detailed explanations on the referential choice from a pragmatic perspective, although his account is mainly based on isolated sentences. I review his work in §2.4.1.

The issue of 'referential choice' seems to be the predominant subject in the literature on anaphora. In other words, studies of anaphora are mainly done from the perspective of production or encoding. There is another aspect to studies of anaphora, that is, from the perspective of processing or decoding/interpretation. This considers whether or not an anaphor is coreferential with a particular entity, and suggests which entity is coreferential with the anaphor.

The two opposite perspectives are not always consciously differentiated. This is only natural because these two perspectives are closely related. However, it is important to be aware that production does not always equate totally with interpretation and the two do not always stand in a one to one relation. For example, in terms of interpretation, ellipted arguments are necessarily given information or information known to the addressee or inferable from the context in which it appears. However, the reverse, i.e. in terms of production, does not always hold; given information is not restricted to ellipsis, and can be expressed by a pronoun and lexical NP. Du Bois (1987:830) has made an analogous statement; 'If a mention is new information, this typically entails that it will be realised with a full NP, but the converse is far from always true.' To take another example, ellipsis almost always represents coreferentiality (see Chapter 6), but coreferentiality can be variously represented by ellipsis, pronominal, or even lexical NPs at times, as seen in §1.5.1.3. Hence, studies on referential choice alone are inadequate to account for anaphora as a whole. While it is important to consider the referential choice made by the speaker in order to interpret his/her intended meaning, I shall focus on processing. As indicated
in the title of the thesis, this study is about reference-tracking and aims to elucidate the mechanisms which identify the referent of ellipted argument.

The term 'reference-tracking' was first used by Du Bois (1980) in his study showing the correlations between discourse-pragmatic factors and reference-tracking systems (Fox 1996:vii). He explains the correlations through the notion of 'preferred argument structure'. Preferred argument structure is highly relevant to my discussions of direct alignment and argument ellipsis, hence they are discussed together in Chapters 4 and 5. A general typology of reference-tracking systems was delineated by Foley and Van Valin (1984), and this is the topic of the next subsection.

2.2 General typology of reference-tracking systems

Foley and Van Valin (1984) present a typology of reference-tracking systems, and suggest four basic systems for tracking referents:

(a) switch function (seen, for example, in voice alternations between active and passive)

(b) switch reference (a marking or an inflection showing that the subject of a dependent clause is the same as or different from the subject of an independent clause)

(c) gender (i.e. lexical coding/agreement and noun class)

(d) pragmatic inference

According to Foley and Van Valin, ellipsis in Japanese falls under the last category. Their claim on pragmatic inference is summarised as follows:

Inference systems are exemplified by the languages of Southeast and East Asia. These languages are characterized primarily by the lack of any of the three systems. Zero anaphora is heavily used in these languages but assignment of coreference is often determined by the subtle use of sociolinguistic variables and is not directly signalled in the linguistic form.

Presumably, there are other means to identify participants.

Foley and Van Valin (1984:324)
Foley and Van Valin characterise ellipsis by such elusive ideas as 'sociolinguistic variables' and 'context', and provide no further explanation of pragmatic inference systems. Subsequently, as a development of Foley and Van Valin's typology, Comrie (1989) presented general principles underlying reference-tracking systems in terms of devices and parameters (inherent/assigned and local/global), but he did not explore the issue of ellipsis in depth. A similar, but less theoretically structured, typology under the name of ‘referential disambiguation systems’ is found in Heath (1975), but the aspect of pragmatic inference is not discussed by him.¹

A more recent work by Van Valin and Lapolla (1997) touches on intersentential pronominalisation, in which ellipsis was briefly discussed using a short text in Chinese. They explain the mechanisms of ellipsis using the notions of referential distance (Givón 1983) and 'topic chain'. Referential distance refers to a distance (in terms of clauses) between the first mention of a referent and its subsequent mention, and this distance can affect the form of the subsequent mention (see §6.1 for the discussion of this view in relation to markedness). The more clauses that intervene between the mentions of a referent, the more explicit the later representation of the referent must be (Van Valin and Lapolla 1997:231). 'Topic chain' refers to cases in a sequence of clauses where the topic is referred to by ellipsis after its first mention (c.f. §2.4.2). There may be subtopics as well as the main topic, and any of them can be ellipted. Those ellipses are disambiguated by the semantics of the predicate or identifiability, in which world knowledge seems to be the key in their analysis.

This work is certainly an advancement on earlier works, and the explanations by Van Valin and Lapolla may be adequate for Chinese, but not in terms of Japanese. The differences between Chinese and Japanese in the use of anaphora are discussed in §2.4.2. Although the importance of identifiability through verbal semantics and world knowledge is not denied (see §5.5.2 and §7.3.4), if more concrete explanations are not provided, we are still no further than appealing to a general notion of
'pragmatic inference', which was the stand taken in Foley and Van Valin (1984). As far as the mechanisms of ellipsis in Japanese are concerned, these explanations are still inadequate to capture the whole picture. The issue of reference-tracking systems, particularly of ellipsis, thus, remains a relatively unexplored area in linguistics.

Van Valin views pragmatic inference systems from a different perspective, which I find tenable (1987:527):

All language users must be able to make certain kinds of inferences in order to interpret speech (Gumperz 1982), and consequently inference is a way of establishing coreference that every language employs. This means that the languages discussed with respect to inference are really characterised not so much by their use of inference as by their lack of the other three systems. These other systems can, therefore, be viewed as lexical and grammatical devices for reducing the inferential burden of the language user.

Here Foley and Van Valin (1984) and Van Valin (1987) claim that pragmatic inference languages lack the other three systems. However, they also state that languages said to rely on inference systems may also utilise lexical coreference mechanisms such as honorific codings, which parallel gender systems. This is exactly the subject of my discussion in Chapter 3. It delineates various other types of argument-inferring morphemes as a means of retrieving the identity of ellipted referents, and hence refutes Foley and Van Valin's claim that assignment of coreference is often not directly signalled in the linguistic form. Chapters 3 and 4 will demonstrate that in fact, as far as Japanese is concerned, it utilises all four systems in opposition to Foley and Van Valin's claim that pragmatic inference languages 'lack the other three systems'; switch function is discussed in §4.5.2, switch-reference systems in §3.5, and noun class by means of honorific codings in §3.3.

Foley and Van Valin (1984:108-134) discussed the notion of 'pivot' as the element of NP which governs coreferentiality and ellipsis. They divide pivots into two types: pragmatic pivots and semantic pivots. The rest of this paragraph summarises their description of the two types of pivots (ibid). 'Pragmatic pivots', often the subject, are selected by the demands of clause linkage under coreference,
namely, discourse pragmatics (e.g. givenness and definiteness) and topicality notions. These pivots are the targets of NP ellipsis, and hence represent the syntacticisation of discourse factors in clause-internal grammar. The choice of 'semantic pivot' is based on semantic grounds, predominantly picking out the actor macro-role, but also others such as undergoer and locative. Although ellipsis of NP arguments is not restricted to semantic pivots, the semantic pivot possesses a privileged status; for example, it is monitored by the switch-reference system.

This notion of pivot captures the fundamental ideas behind the two principles which I am proposing for ellipted referent identification. The first principle is that a sentence is structured in a way to anchor the subject where an argument high in terms of discourse salience and animacy is chosen to be the subject (by the principle of direct alignment discussed in Chapter 4). The second principle is that these sentences are cohesively sequenced with the subject as the pivot, and this subject can then be ellipted (by the principle of ellipsis in Chapter 5, see also §6.1).

2.3 **Syntactic approaches to coreference**

The interpretation of an anaphor is determined by its antecedent, so that anaphor resolution is about determining the relation between anaphor and its antecedent. Within the sentence, this is handled by a module of generative grammar under the name of 'Binding theory' which specifies the interpretation and distribution of various anaphors in terms of coreferentiality with a local NP. Binding theory is found in the three main varieties of generative grammar: Government and Binding Theory (GB, developed by Chomsky and published in 1981), Lexical Functional Grammar (LFG, developed by Bresnan and Kaplan initially in the late 1970's and published in Bresnan (ed.) in 1982), and Head driven Phrase Structure Grammar (HPSG, developed by Pollard and Sag and published in 1987 as a revised model of 'Generalized Phrase Structure Grammar'). While there are differences in the contents of binding theory among the various types of grammar, what they have in common is
that they all utilise the following fundamental notions which constitute binding theory:

- **a set of binary features** classifying different NPs in terms of referential properties; for example, GB has two values of binary features, whether or not anaphoric [± anaphoric] and whether or not pronominal [± pronominal]. HPSG uses a sortal hierarchy of nominal-objects. LFG uses three values [± subject], [± nucleus], and [± logophoric].

- **commanding condition** is a criterion employed in the binding condition. For example, 'c-command' in GB, 'o-command' in HPSG, and 'f-command' in LFG.

- **binding principles/condition** constitute the key element in binding theory. They specify the distributional aspect of each NP; the distribution is critical in determining whether NPs are coreferent or not.

- the notion of **local domain** used in the principles; every theory employs a slightly different domain of what 'local' refers to.

Since there is not enough space to present the three types of grammar in detail, I briefly present the essence of the Binding Theory of GB here, because it leads to the topic of the next subsection: pragmatic approaches by Levinson who constructs his pragmatic account as an alternative to a part of the Binding Theory of GB. The Binding Theory of LFG is presented in §2.5.2.1 in the discussion of computational approaches by Kameyama.

The following description of GB is adopted from Sells (1985) and Levinson (1991).

**Binding Principles**

A. 'Anaphors' must be bound in their minimal governing category
B. Pronouns must be free in their minimal governing category
C. Lexical NPs must be free everywhere

'Anaphor' under A has a restricted reference to reflexive and reciprocal forms, and 'minimal governing category' (local domain) roughly refers to a clause-mate. The following are some instantiations of each principle:

[Following Principle A] Johni washed **himself**.
[Following Principle B]  * John$_i$ washed him$_j$.  -->  John$_i$ washed him$_j$.  
     John$_i$ said that he$_j$ has been to Paris.

[Following Principle C]  He$_j$ said that John$_i$ has been to Paris.

When applied to simple English sentences, such as the above, GB appears a promising theory. However, GB gives rise to a number of problems that cannot be solved even in English. Those problematic instances are presented in the next subsection in which Levinson proposes an alternative account.

Generative grammars aim at being able to deal with the various phenomena of anaphora not only in English but also cross-linguistically. However, this has been a difficult challenge. In my view, the difficulty is associated with the fact that the generative grammars originated in syntax, and then sought to incorporate pragmatic phenomena like anaphora into the grammars. Syntax is a module of linguistics which deals in principle with individual sentences, but not with sequences of sentences. Consequently, what generative grammars primarily account for is those anaphors which appear in intrasentential and non-finite clauses, but little work is done on intersentential anaphors. Furthermore, in achieving cross-linguistically viable grammar, syntax is particularly confined by a number of language specific features.

In contrast, Levinson (1987, 1991) contends (see §2.4.1) that the issue of anaphora is primarily a pragmatic matter rather than a syntactic matter, because the interpretation of a linguistic entity (i.e. anaphor) depends on another entity (i.e. antecedent). In my view, there is a need for fine poise between syntax and pragmatics in dealing with anaphora, because an anaphor may be in the same clause/sentence as its antecedent or may cross over to another sentence. This view is captured in Huang's (1995:1112) adaptation of the Kantian slogan - 'Syntax without pragmatics is blind. Pragmatics without syntax is empty.' What I will be proposing in this thesis aims to satisfy both domains; Chapter 3 deals with elements of sentence-level alone, Chapter 4 deals with elements of the intersection of sentence-level and intersentential-level, and Chapter 5 deals with intersentential-level elements. In addition, Chapter 3 deals with morphological level elements.
The next subsection reviews the work by Levinson (1987, 1991) which deals with anaphora from a pragmatic perspective, but also utilises a part of GB, one type of generative grammar.

2.4 Pragmatic approaches

Levinson (1987, 1991) proposes a pragmatic approach to the issue of anaphora in English, and then he extends his account to deal with ellipsis in Guugu Yimidhirr (an Australian language). This is presented in §2.4.1. I then discuss in §2.4.2 an application of his theory to ellipsis in Chinese by Huang (1994).

2.4.1 Levinson

Levinson introduces a pragmatic principle called 'generalised conversational implicature', which is a modification of Gricean theory (1975). He utilises a part of Binding Theory of GB, i.e. Principle A on reflexive pronouns (though there are other versions such as 'B first account' to deal with other languages) for locating the distributional aspects of anaphor in relation to its antecedent. He claims that his account replaces the rest of the Binding Theory. Generalised conversational implicature is manifested in 'The semantic content hierarchy' below showing the correlation between the types of anaphors and their semantic contents.

[Strong] lexical NP > pronoun > zero anaphora [Weak]

<table>
<thead>
<tr>
<th>disjoint</th>
<th>&lt;&lt;----------&gt;&gt;</th>
<th>co-referential</th>
</tr>
</thead>
<tbody>
<tr>
<td>informationally</td>
<td>stronger</td>
<td>weaker</td>
</tr>
<tr>
<td></td>
<td>more specific</td>
<td>more general</td>
</tr>
<tr>
<td>lexical form</td>
<td>longer</td>
<td>shorter</td>
</tr>
</tbody>
</table>

Figure 2: The semantic content hierarchy

Levinson claims that the interaction of the anaphors under this proposal accurately predicts the quite complex pattern of preferred (in a sense, default) interpretation of

---

1 Grice (1968, 1975) proposed the 'co-operative principle'; an underlying principle that determines the way in which language is used with maximal efficiency and effectiveness to achieve rational interaction in communication. More specifically relevant here is Grice's Maxim of quantity.
anaphors. A choice to the right of the hierarchy (indicated by [Weak]) will tend to be informationally weaker, more general, and lexically shorter than a choice to the left (indicated by [Strong]), for example, 'he' [weak] vs 'the man' [strong]. The following pair of examples illustrates how the semantic content of anaphors affects their interpretation.

(1a) John turned the key and he opened the safe.
(1b) He turned the key and John opened the safe.

When the first mentioned referent has a stronger semantic content than the second, as in (1a), (i.e. strong (John) followed by weak (he)), a coreferential reading is preferred, provided that ‘he’ is unstressed. On the other hand, the reverse order of anaphors, i.e. weak to strong as in (1b), results in a non-coreferential reading.

To account for the distribution of anaphors in relation to their antecedents, Levinson utilises Binding Principle A of GB as a basis (called the 'A-first account'). Under this principle, reflexives are treated as the base anaphor, and other anaphors are induced by Generalised conversational implicature. This is stated as follows (Levinson 1987:410, brackets and underlines mine):

A choice to the right [Weak] tends to implicate a coreferential reading with another NP in the discourse in all loci where a reflexive could not have been used. A contrastive choice to the left [Strong] will tend to implicate a disjoint reading from another NP in the discourse that may otherwise be a possible antecedent.

Levinson's account handles a number of issues that are problematic for GB. I outline some such examples of Levinson's account here. Firstly, 'Lexical NP' in the Levinson hierarchy includes subclasses of NPs, so that two lexical NPs can be interpreted as coreferential, if one NP has a semantically stronger, more specific content than the other NP. The following pair of examples illustrates this point; although 'the ship' and 'the ferry' are both lexical NPs, 'the ferry' is more specific and therefore stronger than 'the ship' (Levinson 1991:110).

(2a) The ferry hit a rock. The ship capsized.
(2b) The ship hit a rock. The ferry capsized.
Hence, Levinson's account would give the correct interpretation that (2a) gives a coreferential reading for having the order of a strong, more semantically specific term followed by a weak term, while (2b) gives a disjoint reading for having the order weak before strong. GB, on the other hand, would incorrectly predict both (2a) and (2b) to be disjoint following Binding Principle C, stating that lexical NPs must be free everywhere.

Levinson's account can be readily adapted to explain comparable pairs of sentences in Japanese. When a strong or more specific referent is followed by a less specific referent, as in (3a), i.e. Tanaka-kachoo (strong) to kachoo (weak), a coreferential reading is preferred, while in the reverse case as in (3b), a disjoint reading is preferred (examples from Takubo 1997:22):

(3a) 田中課長は最近元気がない。課長の奥さんに原因があるのかもしれない。
     Tanaka-kachoo-i -wa saikin genki-ga nai.
     -manager-Top lately energy-SB Neg
     Kachoo-i -no okusan-ni genin-ga aruno kamoshirenai.
     manager-Gen wife cause-SB exist maybe
     'Tanaka manageri doesn't look happy these days. Hisj wife may be something to do with it.'

(3b) 課長は最近元気がない。田中課長の奥さんに原因があるのかもしれない。
     Kachoo-i -wa saikin genki-ga nai.
     manager-Top lately energy-SB Neg
     Tanaka-kachoo-j -no okusan-ni genin-ga aruno kamoshirenai.
     -manager-Gen wife cause-SB exist maybe
     '(The) managerj doesn't look happy these days. Tanaka managerj's wife may be something to do with it.'

Thus, the semantic contents and the order of the NPs are critical in determining their coreferentiality.

However, I raise two points in relation to Levinson's account. His hierarchy did not explicitly include this aspect of lexical subclasses. A more precise representation reflecting the above issue, therefore, can be expressed as lexicaNP\(a >n >z\) > [pronoun] > [zero anaphora], where 'a>n>z' are lexical items of diverse specificity in terms of semantic contents including the definite and indefinite
distinction. Furthermore, there is a problem in this account in that Levinson only considers a linear order of anaphora, and does not consider the issue of backward anaphors, such as, ‘Wherever he went, Johni was happy’.

Secondly, Levinson's account handles another problematic issue for GB. The incorrect postulation of GB under Binding Principles A and B that anaphors and pronominals are in complementary distribution gives rise to two basic problems: an interrelated problem of 'long distance reflexives' and 'logophoricity' on one hand, and the inability to allow exceptions on the other. In what follows, these problems are explained in that order.

'Long distance reflexives' are reflexives whose antecedents lie beyond the immediate clause. Although the issue of long distance reflexives is problematic for GB, they are common in a wide range of languages including Japanese. The following example from Japanese illustrates this point (Levinson 1991:121 citing Kuno 1987:137):

(4a) 太郎は自分が天才だと思っている。
    -Top self-SB genius-Cop Comp thinking
    'Taro thinks that self is genius.'

The literal translation of the above example is 'Taro thinks that self is genius.' This sentence violates Binding Principle A. On the other hand, a long distance reflexive does not violate Levinson's account, because it allows a long distance reflexive to alternate with a pronominal (Levinson 1991:124). Although this is a tenable statement for English, it will be incorrect if it were to be applied to Japanese. This is because the third person pronouns kare (he) and kanojo (she) are not generally used as anaphoric pronouns intra-sententially in Japanese, as discussed in §1.5.1.3. The following shows that the anaphor kare (he) cannot be coreferential with Taro, hence a pronominal is not an alternative to the use of reflexive in Japanese:

(4b) 太郎は彼が天才だと思っている。
    -Top 3sg-SB genius-Cop Comp thinking
    'Taro thinks that hej is genius.'
Furthermore, the GB postulation that reflexives and pronouns are in 
complementary distribution does not hold even in English (example from Levinson, 
1991:120):

(5a) Johni pulled the blanket towards himi.

(5b) Johni pulled the blanket towards himselfi.

Although (5a) violates Binding Principle A of GB, in reality both (5a) and (5b) are 
both acceptable. The subtle meaning difference relates to the next problem that of 
logophoricity. It is due to 'point of view' in that (5a) is described from the speaker's 
point of view (empathy), while (5b) from the protagonist's point of view (roughly, 
logophoric).

Moreover, GB cannot account for exceptions such as the following, where 

(6a) Only Felixi voted for himi/Felixi.

(6b) Only Felixi voted for himselfi.

Both (6a) and (6b) are acceptable with coreferential readings. The difference between 
(6a) and (6b) derives from different truth-conditions. Namely, (6a) necessarily 
describes a situation in which Felix only got one vote of his own, while (6b) may 
describe a situation in which Felix got many votes but he was the only candidate who 
voted for himself.

Although Levinson's account is said to handle this problematic issue for GB, 
following Generalised conversational implicature on anaphors, Levinson's account 
will predict the same incorrect interpretations as GB in the above examples, because 
states that the use of stronger form of anaphor implicates a disjoint reading. (5a) 
and (6a) will not have coreferential readings if (5b) and (6b) are acceptable, since a 
pronoun is used where reflexive can be used. How does his account handle (5a) and 
(6a) which GB fails to account for? He explains that the interpretation derived from 
Generalised conversational implicature is only a defeasible implicature, so that his 
account allows the use of more informative terms instead of default anaphor. Such 
terms carry marked meaning but still give a coreferential reading (Levinson 
1991:117). For example, (5a) shows an instance where world knowledge overrides a
preferential interpretation. Namely, in order for John to pull a blanket towards some third party, he must naturally be behind that party, but then it is unlikely that he can reach it, although 'himj' is also possible. Hence, the use of either pronoun or reflexive results in the same interpretation. (6a) implicates more restrictive circumstances of different truth-conditions.

Levinson's account is an important piece of work which provides explanations for a number of problematic issues attributed to GB. Nonetheless, there still remain a number of problems in Levinson's account, and I point out three of them here. Firstly, Levinson's account is trapped by the same inherent problem as GB by taking on a part of Binding theory. Like GB, Levinson's account incorrectly posits as its basis that reflexives and pronouns are in complementary distribution. As quoted above, Levinson's account provides an escape clause of sorts to deal with this problem, in that he allows more than one type of anaphor in the same distribution, as in (5a,b) and (6a,b), but this is ad hoc and rather dubious without explicit conditions. Levinson's account in positing complementary distribution of anaphors also gives rises to two further problems. One is to do with cross-linguistic issues. There are languages with no reflexive pronoun, for example, many Australian languages including Guugu Yimidhirr which Levinson discusses and Austronesian languages (Levinson 1991:133). As reflexive forms are the basis for his account, lack of reflexive forms requires an alternative account. Consequently, Levinson proposes his 'B first account' in which pronominals are the basis. There is a further problem that some languages, such as Marathi and Norwegian, have multiple reflexive forms which have different distributions and some of which have overlapping distributions (Dalrymple 1993).

The other problem is that Levinson's account does not consider the fact that the exact repetition of a referent can be coreferential. For example, some lexical forms in Japanese are often used anaphorically to be coreferential with the exact same lexical forms of NP without marked implications, as shown in (7) (§1.5.1.3):

(7) 先生は作文を読んでいます。私は心配だった。先生は読み終わると、うまいと言った。
Sensei-wa sakubun-o yondeiru. Watashi-wa shinpai datta. teacher-Top essay-OB reading 1sg-Top anxious was
Sensei-wa yomi owaru to, umai to itta.

teacher-Top read finish when, good Comp said

'The teacher is reading (my) essay. I was anxious.

When the teacher finished reading (it), (she) said that (it was) good.'

(PHP, 8.1993:21)

The same pattern is also observed in Chinese (Huang 1994:257), though perhaps to a lesser extent than in Japanese. English also has a number of instances where NPs are repeated without resorting to anaphoric pronominals. This happens when characteristics of objects and people are focused, for example, (6a). Further examples are as follows:

(8) You don't need sulfur for drying apricots; Sulfur ruins the flavour.

(Bolinger 1979: 291-2)

(9) Everyone has finally realized that Oscar is incompetent. Even Oscar has realized that Oscar is incompetent


Moreover, Fox (1986:38) points out another repetitive usage of full NPs. Full NPs are repeated, even when their referents are retrievable from the preceding clause, when they function semantically to signal paragraph boundaries.

Secondly, Levinson's account does not provide answers to the questions asked in this thesis - how to identify the referent of an anaphor. In my view, the strength of Levinson's account lies in its providing semantic and pragmatic explanations as to why a particular anaphor was chosen against the default anaphor, when both can occur in the same distribution. However, his account is not fully equipped to suggest whether or not there is a choice of anaphors for a given sentence, nor how to judge whether a particular anaphor is used for a marked meaning with coreferential interpretation, as in (5a) and (6a), or simply for denoting a disjoint instead of coreferential reading. His account, therefore, does not so much predict as explain coreferentiality. It does not seem to offer coreferentiality and grammaticality judgements on sentences, because this is left solely to native speakers' intuitive knowledge, and the analysis starts after the coreferentiality of an anaphor has been identified. For the purpose of my study, Levinson’s term 'defeasible implicature' must be precisely explicated. Otherwise, it is not fully descriptive. For example, a non-
native speaker of English or a machine trying to process a sentence cannot know whether (5a) and (6a) are used with marked meanings and still give coreferential readings, or whether they give disjoint readings instead of coreferential readings, or whether they are simply ungrammatical. One cannot know that on the one hand, (5a) and (6a) exploit the option of expressing the coreferential meaning by a pronominal or a lexical NP instead of the default reflexive, in order to implicate marked meaning, while on the other, no such options exist for structurally identical sentences as (5a,b), such as 'Johni bought the blanket for himself/¡himì', where 'him' cannot possibly be coreferential with 'John'. Levinson does not explain whether or not a sentence has such options, which makes his explanation ad hoc. In short, Levinson's account can explain what happened, but cannot always predict what will happen, i.e. whether or not a sentence has a coreferential reading.

Thirdly, and most importantly, Levinson's account is at its best in dealing with intrasentential anaphora. It can predict whether or not an anaphor is coreferential with a local NP to a great extent. However, when an antecedent is non-local, it is not equipped to predict where this antecedent is. It does not extend to offering an explanation for finding possible candidates as an antecedent for an anaphor. In other words, Levinson's account has more or less the same limited scope as GB, in that it mainly explains isolated sentences but does not fully account for a sequence of sentences. This is in spite of his claim that the issue of anaphora is primarily a pragmatic matter rather than a syntactic one, because the interpretation of an anaphor depends on another entity which may be in another sentence.

Regarding ellipsis, Levinson extends his account to examine the Australian language Guugu Yimidhirr, whose use of ellipsis is purported to be grammatically unconstrained, as stated below (Levinson 1991:383, underlining mine):

> Ellipsis, which is a reduced pronominal form, tends to pick up reference from the last relevant NP. Since this is merely default implicature, operative in the absence of information to the contrary, it will of course be possible to find many exceptions to the tendency, but in that case there should be specific reasons to prefer another interpretation.
This explanation contains many vague unexplained elements which are indicated by the underlines. The passage 'tends' to pick up reference from the last relevant NP contains no explanation of what 'relevant' means. And whatever 'relevant' means, it is only a 'tendency'. What information is Levinson referring to when he says, 'information to the contrary'? Whatever 'contrary information' may be, it is only 'possible'. In saying 'Specific reasons to prefer another interpretation', Levinson does not specify those reasons.

Under the principle quoted above, the use of zero anaphor in example (10) suggests that it is coreferential with the last NP which is 'Heçi', while the use of a stronger form 'nhangu' (he-Acc/Dat) suggests a disjoint reading:

(10) Nyulu nhayun gadaa nhangu daamanhu
     he-Nom that-Abs come he-Acc/Dat spear-Purp
     'Heçi comes [øi to spear himj.] --> He came to spear him.'

(10) and other supporting examples from Guugu Yimidhirr that Levinson quotes in his paper (1987) all involve zero anaphors occurring in non-finite clauses, which are syntactic gaps. GB offers the so called typology of 'empty categories' (null phonetic forms) to account for zero anaphors occurring in non-finite clauses, which are handled under Control Theory. Although at the beginning of his paper, Levinson quotes a dialogue which contains a number of intersentential zero anaphors, he does not analyse it. Levinson's account turns out, after all, to have the same limited scope as GB, in that zero anaphors in non-finite clauses are only one part of zero anaphors.

The next section discusses Huang's (1994) analysis of zero anaphor in both finite and non-finite clauses in Chinese, which, like Japanese, frequently uses zero anaphors.

2.4.2 Huang

Huang (1994) proposes an account which is a modification of Levinson's analysis to deal more adequately with languages like Chinese that frequently use zero anaphors. It provides a detailed explanation of how various pragmatic principles and constraints lead to the most appropriate choice of interpretation for an anaphor from
other possible inferences. Huang's analysis is based on 'A pragmatic theory of anaphora' which consists of interpretation principles (i.e. default interpretation) and consistency constraints (i.e. overriding features), as shown below (1994:16).

A pragmatic theory of anaphora ²

a. Interpretation principles

Assuming that a reflexive is necessarily referentially dependent, and a pronoun and a zero anaphor are optionally but preferably referentially dependent,

(i) the use of a zero anaphor will implicate a local coreferential interpretation;
(ii) the use of a pronoun will implicate a local coreferential interpretation, unless the pronoun is used where a zero anaphor could occur, in which case, the use of the pronoun will implicate a disjoint reading.
(iii) the use of a reflexive will implicate a local coreferential interpretation, unless the reflexive is used where a pronoun or a zero anaphor could occur, in which case, the use of the reflexive will implicate a marked meaning:
(iv) the use of a name or a lexical NP where a pronoun or a zero anaphor could occur, will implicate a disjoint reading.

By way of exemplifying the principles in Chinese, (11) shows that the use of a pronoun 'ta' (3sg) gives a strong preference to a coreferential reading. However, if a pronoun is used, as in (12a), where a zero anaphor could have been used, as in (12b), then the pronoun gives a disjoint reading. (12c) illustrates the logophoric use of the reflexive 'ziji'. I presume (12c) implicates a marked meaning, since the reflexive is used where a zero anaphor is used (12b). Further, the use of a lexical NP gives a strong preference to a disjoint reading, as in (13):³

C(11) Lao Wang shuo ta zai Beijing zhangda.
   Lao Wang say 3sg in Beijing grow up
   'Lao Wang says that he1/2 was brought up in Beijing.'

C(12a) Lao Wang yue shuo, ta yue xingfen.

² For simplicity, I have reworded some parts.

³ Huang uses the following notations for his examples from Chinese: CL = classifier; CRS = currently relevant state; EMP = emphatic particle; BA = the ba marker in the ba construction; RV = relative verb. "(he1/2/I...)' denotes that 'he1' is the most preferred choice of interpretation, 'I' is the next choice, etc. And the subscribed numbers are used instead of the conventional 'i' and 'j' to indicate coreferentiality, so that 'he1/2' denotes that the most preferred choice of interpretation for 'he' is coreferential with the NP marked by the subscript '1', and the next with '2' subscript NP in the sentence. Note that all Chinese examples in this subsection are from Huang (1994), and Chinese sentences are noted as 'C' in front of example numbers to differentiate from Japanese examples.
Lao Wang more talk 3sg more excited
'The more Wang1 talks, the more he2 gets excited.'

C(12b) Lao Wang yue shuo, ø yue xingfen.
Lao Wang more talk more excited
'The more Wang1 talks, the more (he1/2/l/you/we/they ...) gets/get excited.'

C(12c) Lao Wang yue shuo, ziji yue xingfen.
Lao Wang more talk self more excited
'The more Wang1 talks, the more he1 gets excited.'

C(13) Xiaoming shuo Xiaoming xia ge yue jiehun.
say Xiaoming next CL month marry
'Xiaoming1 says that Xiaoming2/he2 will get married next month.'

However, the following pair of examples demonstrates a problem with these principles, in that the use of either a zero anaphor or pronoun results in the same preference for a coreferential reading:

C(14a) Xiaoming shuo ta xia ge yue jiehun.
say 3sg next CL month marry
'Xiaoming1 says that he1/2 will get married next month.'

C(14b) Xiaoming shuo ø xia ge yue jiehun.
say next CL month marry
'Xiaoming1 says that (he1/2/l/you/we/they/...) will get married next month.'

Following Huang's principles, the interpretation of (14a) using a pronoun should be 'he2/1' (i.e. preference to a non-coreferential reading) rather than 'he1/2' (coreferential), since a pronoun is used where zero anaphor can be used in (14b). But in reality this is not the case. Huang offers four possible solutions, all syntactically based, to tackle the incorrect prediction of anaphor identity that his principles make in such sentences. Those solutions are all inadequate, as he admits. This problem seems to demonstrate an unstated and incorrect assumption in his analysis that one and only one unmarked anaphor exists for each sentence. It is apparent in a number of other examples used in his book that some sentence constructions can have more than one type of anaphor as unmarked forms, indicating that his theory does not fully account for the data of even his own. His examples (15a) and (15b) constitute another pair which give the same interpretation regardless of whether a zero anaphor or a pronoun is used:

C(15a) Lao Li yinwei bing le, suoyi ø bu neng lai.
because ill CRS so not can come
'Because Li 1 is ill, (he₁) cannot come.'

Even in English, which rarely allows zero anaphors, a choice of unmarked anaphors can be seen in coordinate structures, as in (16):

(16a) John₁ came into the room, and ø₁ sat down on that chair.
(16b) John₁ came into the room, and he₁ sat down on that chair.

Following Huang's theory, the use of a pronoun in (16b) should implicate a disjoint reading, if it is used in the position where a zero anaphor can be used, as in (16a). Hence, (16b) should have a disjoint reading if 'he' is used, provided that ‘he’ is unstressed, but in fact either use of zero anaphor or pronoun gives a coreferential reading.

In applying this account to Japanese, the interpretation of anaphors is less complicated than Chinese in a sense, because the opposition between zero anaphors and pronouns is not an issue in Japanese. This is because, pronouns in Japanese usually have inanimate referents (Murata and Nagao 1997), and personal pronouns are not generally used anaphorically between clauses, as seen in (4b) and §1.5.1.3. The use of personal pronouns 'he' in the Japanese equivalent of (11), (12a), (14a) and (15b) generally yields disjoint readings, while in Chinese, as in English, it can give coreferential readings.

According to Huang's account, the use of a zero anaphor will implicate a local coreferential interpretation, and the use of the reflexive pronoun will implicate a local coreferential interpretation, unless the reflexive is used where a pronoun or a zero anaphor could occur, in which case, the use of the reflexive will implicate a marked meaning. In other words, the use of a zero anaphor and the reflexive pronoun will always implicate a local coreferential interpretation. This is generally true, as shown in (17); these sentences use either the reflexive pronoun and a zero anaphor to denote coreferentiality, though the use of the reflexive conveys an emphasis, because the reflexive pronoun is used where a zero anaphor can be used:
(17) 太郎は花子を自分の家に呼んだ。
\[ Taro_{1}-wa \ Hanako_{2}-o \ jibun_{1}-no \ / \ @_{1} \ ie-ni \ yonda. \]
\[-Top \ -OB \ -Gen \ home-to \ invited \]
'Taro invited Hanako to his1 home.'

However, some examples do not conform to Huang's account. For example, the use of a zero anaphor does not denote coreferentiality, as shown in (18a). The coreferentiality is denoted only by the reflexive pronoun, as in (18b):

(18a) 花子は\[ \emptyset \]推薦した。
\[ Hanako_{1}-wa \ \emptyset_{2/1} \ suisen \ shita. \]
\[-Top \ OB \ recommend \ did \]
‘Hanako 1 recommended (someone2).’

(18a) 花子は自分を推薦した。
\[ Hanako_{1}-wa \ jibun_{1} \ suisen \ shita. \]
\[-Top \ OB \ recommend \ did \]
‘Hanako 1 recommended (herself1).’

Moreover, Huang's account does not consider a long distance reflexive, such as (19), although a long distance reflexive is also seen in Chinese:

(19) 花子は自分が約束したことを後悔している。
\[ Hanako_{1}-wa \ jibun_{1}-ga \ yakuukoshita\] koto-o \ kookaishi-teiru. 
\[-Top \ SB \ promised \ thing-OB \ regretting \]
‘Hanako 1 is regretting what self1 has promised.’

Another problematic issue which Japanese presents for Huang's account is the anaphoric use of lexical NPs, as seen in (7) in the repetitive use of 'sensei' (the teacher). This anaphoric use of lexical NPs signals a coreferential reading. This poses a problem in Huang's account, the principles under (iv). If there is more than one teacher in the context, identification of referent may seem problematic. However, in reality those teachers will be differentiated by some other linguistic means, for example, ‘Suzuki sensei’ (use of proper noun) or ‘kono sensei’ meaning 'this teacher' (use of a deictic word).

The second part of Huang's description is 'Consistency constraints', which take precedence over the interpretation principles.

b. Consistency constraints

---

4 Those examples represent only part of the differences between a zero anaphor and the reflexive in Japanese. The differences between a zero anaphor and the reflexive are so convoluted that it would take another thesis to extensively explore the differences. The reflexive is elaborated in §6.4.4.
Any interpretation implicated by (a) is subject to the requirement of consistency with three constraints.

(i) Disjoint Reference Presumption

The arguments of a predicate are intended to be disjoint, unless marked otherwise.

Hence, the clause-mate arguments prefer a disjoint reading, regardless of whether the anaphor is a zero anaphor, as in (20a), or a pronoun, as in (20b):

C(20a) Yang Daniang danxin nuer bu ken cihou ø.

Grandma worry daughter not willing look after

'Grandma Yang₁ is worried that her daughter₂ is not willing to look after (her₁/3/herself₂/me/you/us/Them ...).'</n

C(20b) Yang Daniang danxin nuer bu ken cihou ta.

Grandma worry daughter not willing look after 3sg

'Grandma Yang₁ is worried that her daughter₂ is not willing to look after her₁/3.'

Huang did not account for one difference between (20a) and (20b), in that (20a) can have a coreferential reading with the clause-mate, i.e. 'herself₂' as a secondary preference, while (20b) cannot. This suggests that this constraint contains varying degrees of preferred reading with a zero anaphor for more coreferentiality.

(ii) Information Saliency, so that

(1) implicatures due to higher constructions may take precedence over implicatures due to lower constructions (i.e. 'matrix wins'),

(21a) attests this constraint of 'matrix wins', in that the preferred antecedent of the pronoun 'ta' is not 'Li' but 'Wang' in the matrix clause. However, (21b), though taken from Huang (1994:135), demonstrates a violation of Huang's constraint which he did not identify; following the constraint, the reading for (21b) should also have been 'he₁/2/3':

C(21a) Lao Wang yiwei Lao Li zhidao ta xiawu yao qu kaihui.

think know 3sg this afternoon will go have a meeting

'Wang₁ thinks that Li₂ knows that he₁/2/3 will have a meeting to go to this afternoon.'

C(21b) Lao Wang yiwei Lao Li zhidao ø xiawu yao qu kaihui.

think know this afternoon will go have a meeting

'Wang₁ thinks that Li₂ knows that (he₂/1/3/I /you ....) will have a meeting to go to this afternoon.'
Hence, I suggest that there is another constraint working - the antecedent of a zero anaphor is more local than that of a pronoun. In other words, using Levinson's account, the choice of a weaker anaphor tends to implicate a more local antecedent than the choice of a stronger form. This new constraint can also explain why the zero anaphor in (20a) can be coreferential with the clause-mate argument, whereas the pronoun in (20b) cannot.

(2) implicatures to coreference may be preferred according to the saliency of antecedent in line with the following hierarchy: topic > subject > object, etc.;

Following this constraint, topic takes precedence as an antecedent for anaphors, regardless of whether the anaphor is a zero anaphor (22a) or a pronoun (22b). I have also presented (22c) to reinforce the argument by showing that without the topic, zero anaphor gives a normal interpretation of local coreference.

C(22a) Xiaohua, Xiaoming yi jin wu, o jiu ba men guan shang le.
     as soon as enter room EMP BA door close RV CRS
'Xiaohua1, as soon as Xiaoming2 enters the house, (he1) closes the door.'

C(22b) Xiaohua, Xiaoming yi jin wu, ta jiu ba men guan shang le.
     as soon as enter room 3sg EMP BA door close RV CRS
'Xiaohua1, as soon as Xiaoming2 enters the house, he1 closes the door.'

c.f. C(22c) Xiaoming yi jin wu, o jiu ba men guan shang le.
     as soon as enter room EMP BA door close RV CRS
'As soon as Xiaoming2 enters the house, (he2) closes the door.'

There is no topic marker in Chinese, and the topic is recognised by the initial position of the topicalised argument.

Here, I examine Japanese translation of the above Chinese examples to see how the constraint works on Japanese. Japanese has the topic marker wa to morphologically encode a topicalised NP, and the notion of topic constitutes an important part of structural organisation. Whether or not an anaphor is coreferential also depends greatly on the marking that the referent has, i.e. the wa/ga distinction, which is elaborated in §3.5.2 and §6.1.

In (22a)', the translation of (22a), Huang's account is adequate, in that the ellipted subject in the matrix clause is coreferential with the topic, if we assume that the matrix subject Hanako is ellipted. The topic in (22a)' is commonly seen as being
preposed, which may not be the same as saying that the topic is coreferential with the ellided matrix subject.

(22a)' 花子は太郎が部屋に出てくるなり戸を閉めた。
Hanako₁-wa, [Taro-ga heya ni haitte kuru nari], ø₁ to-o shimeta.
-Top -SB room into enter as soon as door-OB shut
'Hanako shut the door, as soon as Taro came into the room.'

In the Japanese translation of (22b), the pronoun in (22b)' cannot be coreferential with the topic referent Hanako. This is because, as mentioned earlier, personal pronouns are not generally used anaphorically within the same sentence.

(22b)' 花子は太郎が部屋に出てくるなり彼女が戸を閉めた。
*Hanako₁-wa, [Taro-ga heya ni haitte kuru nari], kanojo-ga₁ to-o shimeta.
-Top -SB room into enter as soon as she-SB door-OB shut
'Hanako shut the door, as soon as Taro came into the room.'

In terms of (22c)', although subject is listed as the next choice of preference in the hierarchy in the absence of a topic marked argument, Huang's account does not always hold. Even though his account is adequate for (22c)', it is not for (22d).

(22c)' 太郎が部屋に出てくるなり戸を閉めた。
[Taro₂-ga heya ni haitte kuru nari], ø₂ to-o shimeta.
-SB room into enter as soon as door-OB shut
'As soon as Taro₂ came into the room, (he₂) shut the door.'

(22d) 太郎が部屋に出てくるので戸を閉めた。
[Taro₂-ga heya ni haitte kita node], ø₃ to-o shimeta.
-SB room into enter came because door-OB shut
'As soon as Taro₂ came into the room, (he₃) shut the door.'

As will be discussed in §3.5, in principle, the ellided subject under this structure with a ga marked subject cannot be coreferential with the subject in the subordinate clause, which denies Huang's account. As will be explained in §3.5.3.1, however, when conjunctive particles denote that the matrix subject is the same as the subject in subordinate clause, as in (22c)', then the sentence can signal coreference.

Furthermore, the topic in Japanese is unrestricted in its grammatical role, so that the topic marked NP can be the subject, object, or oblique (§3.5.3). When a topic marked NP has non-subject function, Huang's constraint b(ii)(2) does not work. In (23), the topic NP is the object, and the zero anaphor binds not with the topic but with the subject.
Moreover, there are sentences where a zero anaphor is coreferential not with the topic subject but with the indirect object. Huang did not consider zero genitive, such as (24).

(24) 太郎は花子にほしい物を買ってあげた。

Taro1-wa Hanako2-ni ø*1/2 hoshii mono-o katte-ageta.

'Taro bought Hanako what (she) wanted.'

Overall Huang’s hierarchy does not seem to work adequately for Japanese.

(iii) general implicature constraints, namely, background assumptions and world knowledge can override implicatures arising from other constraints:

Huang presented the following set of examples to demonstrate the constraint of commonsense knowledge.

C(25a) Yisheng shuo bingren zhidaocommenting o mingtian gei ta kaidao.

doctor say patient know tomorrow for 3sg operate

'The surgeon1 says that the patient2 knows that (he1/3/I/you ...) will operate on him2 tomorrow.'

C(25b) Yisheng shuo bingren zhidacthe patient zhidaocommenting ta mingtian gei ta kaidao.

doctor say patient know 3sgtomorrow for 3sg operate

'The surgeon1 says that the patient2 knows that he1/3 will operate on him2 tomorrow.'

He does not seem to realise that the he1' reading can be reached without commonsense knowledge in these examples; the reading can be induced by the constraints b(ii)(1) 'matrix wins' that the preferred interpretation of pronoun and zero anaphor is coreferential with the matrix subject. Nonetheless, if the secondary reading were to be considered, commonsense knowledge is needed.

I pointed out earlier in (21b) that the antecedent for the zero anaphor should be more local, so that in (25a) it should be 'he2/1', and for the pronoun in (25b), 'he1/2'. However, 'he2' (i.e. patient) does not obtain, because it is our commonsense knowledge that it is the surgeon who operates on the patient, not the other way round,
and this knowledge takes precedence over other constraints. Commonsense/world knowledge is a powerful constraint which I will be referring to in §5.5.2 and §7.2.4.

To sum up, I point out two major areas in which Hunag's analysis is not suitable for Japanese. Firstly, the foundation of his account is based on the incorrect assumption that there is one and only one unmarked anaphor for a sentence, and thus it fails to function when a sentence has more than one possible unmarked anaphor. This is the same problem found in GB, namely the incorrect assumption that anaphors and reflexives are in complementary distribution. Secondly, in applying the analysis to Japanese, many of the principles and constraints become superfluous, because pronouns are generally not anaphoric in Japanese. This makes it simpler, but there is an issue of the wa/ga distinction which does not exist in Chinese and hence is not included in Huang's analysis. I will show in §2.5.1.2, §3.5.2, and §6.1 that the wa/ga distinction holds the key for referent identification in Japanese.

The remainder of Chapter 2 will look at literature which specifically considers argument ellipsis in Japanese.

2.5 Studies of argument ellipsis in Japanese


These works can be classified into two types according to their differences. One concerns differences in perspective: those taking the perspective of production (encoding), and those taking the perspective of interpretation (decoding). This thesis
studies the latter. The other concerns the type of texts analysed. As discussed in §1.6.1, a number of differences correlate with the type of texts, and these differences have a significant bearing on ellipsis. Three parameters are relevant in characterising the different approaches according to the type of texts used. One parameter is whether the texts are written texts (monologue) or spoken dialogue; the second parameter is whether isolated sentences or sequences of sentences are used; and the third is whether sentences are constructed, elicited, or naturally occurring.

In this section, keeping the above-mentioned differences in mind, I review an overview of 'deletion' phenomena (i.e. ellipsis) as discussed in the above literature. I shall not review individual works, since the majority of these account for only part of the complex phenomena of ellipsis, and there are significant overlaps in their claims. I will also refer to various claims made in these works later in this thesis, as they become relevant. There are two works which provide more extensive pictures of the mechanisms of ellipsis. Since these works examine the issue from the perspective of processing which is the aim of this thesis, I devote separate review sections to each of these works after the general review section in §2.5.1. These are the computational approaches presented by Kameyama in §2.5.2, and the machine translation approaches described by Nakaiwa et al. in §2.5.3.

2.5.1 Aspects of deletion

A number of studies have examined deletion phenomena from a range of perspectives, but none of them have provided a complete account. The following subsections will look into these areas.

2.5.1.1 Parallels with English pronominalisation

A number of studies have claimed that the deletion of an NP (i.e. ellipsis) in Japanese parallels pronominalisation in English, although there are significant differences in both function and form. This claim asserts that ellipsis is used in
Japanese basically where a pronoun would be used in English. I suspect this has led the study of ellipsis in computer science to use the term 'zero pronoun' to refer to ellipsis. I am against this term, because it represents an English based idea which assumes that there should be pronouns, which is not the case in Japanese, as discussed in §1.5.1.3. The most notable among those who claim parallelism with English pronominalisation is Kuroda (1965) who was the first to advance this view within the framework of generative transformational grammar. Hinds (1978) and Kuno (1978) made the same claim looking at conversational interaction, and for Kameyama this constitutes the central notion in Centering Theory (1985, see §2.5.2).

2.5.1.2 The wa/ga distinction

The notion of 'topic' has a significant bearing on ellipsis in Japanese. Japanese is a 'topic-prominent' language (Li and Thompson 1976), and the topic plays a major role in its syntactic and pragmatic organisation. Japanese has a distinct discourse topic marker wa, which topicalises a NP of any grammatical relation by being postpositioned to the relevant NP. While wa can topicalise any NP, its most common target is the subject. When the subject is topicalised, the topic marker replaces the nominative marker ga, hence both look like subject markers.

The following pair of sentences illustrates this point:

(26a) 花子が戸を閉めた。

In addition, subjects often appear without case marking, as discussed in §1.6.1.
Although the English translations in (26a) and (26b) are identical, the meanings of (26a) and (26b) are not exactly the same in Japanese. These differences, however, are extra-propositional and depend on the contexts in which they appear, making it difficult to exactly explain the differences in meaning for (26a) and (26b) without contexts.

The functional difference between *wa* and *ga* has been one of the most complicated and problematic issues in Japanese grammar. Since the difference between *wa* and *ga* plays a major role in the mechanisms of ellipsis, I will take time here to review the differences discussed in the literature, before proceeding to the discussion of deletion principles.

There have been a number of theories proposed to account for the functional differences between these particles (Mikami 1960, Kuno 1973, 1987, Shibatani 1990, Tsunoda 1991, Fujii 1991, inter alia). Collective studies of the use of *wa* in relation to *ga* are found in Hinds et al. (1987). The dominant view is a pragmatically-oriented one in which *wa* has thematic and contrastive functions providing old information, while *ga* has neutral descriptive and exhaustive listing functions providing new information in terms of the nominative function. Another prominent functional difference that is widely accepted is the notion of scope, which Mikami (1960) was the first to recognise. The scope of *wa*, as the topic marker, ranges from intra-clusual to, theoretically, as long as the topic lasts, i.e. a whole discourse. By contrast, the scope of *ga*, as the nominative marker, is only over intra-clusual. However, these observations by no means constitute an exhaustive and satisfactory description (Kuno 1973, Hinds et al. 1987, Shibatani 1990), and the functional differences between the
two particles are of continued interest and are the subject of ongoing research by Japanese linguists.

Watanabe (1989), using four stories from primary school textbooks, performed a quantitative study of the function of *wa* and *ga*, along with ellipsis in discourse from the perspective of topic continuity. Her results have shown supporting evidence for the commonly held view about *wa* and *ga*. *Wa* indeed represents old information and wider scope, in that the proportion of *wa*-marked subject participants representing old information was 95% (99.5% definite, though the definition of her use of definiteness is not provided), and 89% of referents of *wa*-marked subjects appeared more than twice in the story. On the other hand, *ga*-marked subject participants represented old information at the rate of 45% (61.6% definite) and only 34% of them appeared more than twice in the story. In terms of ellipsis, the results are intriguing: 100% of ellipted subject participants represented old information (100% definite as well), and 94% of the referents encoded by ellipsis appeared more than twice in the story.

These results can be looked at in another way. Old information was represented by ellipsis 52% of the time, by an overt NP with *wa* 36% of the time, and by one with *ga* 12% of the time (100% in total). The frequency of *ga*-marking at 12% seems a little high. Watanabe does not specify whether the marking and ellipsis belong to the matrix clause or subordinate clause, but this is a critical issue in Japanese (§3.5.2). Since a subordinate subject must be marked by *ga*, whereas a matrix subject can be marked either by *wa* or *ga* (Shibatani 1990:263, see §3.5.3 for exceptions), I suspect that the 12% frequency of *ga*-marked subject participants representing old information is primarily due to them belonging to the subordinate clause. In other words, most of those *ga*-marked subject participants would have been marked by *wa*, had they appeared in the matrix clause.7

---

7 The actual texts used by Watanabe are not presented in her work. Watanabe's results include a number of important factors which support my claims in this thesis. Hence, they are reviewed in §3.5 in detail and at relevant sections throughout this thesis.
Cognitive approaches have been utilised in a number of discussions to explain the correlation between cognitive status and the form of referring expressions (Prince 1981, Givon 1983, Chafe 1987, Levinson 1987, Gundel et al. 1993). They all claim that the more identifiable / activated / evoked a referent is, the simpler the linguistic form: namely, unstressed, lexically shorter and semantically more general forms (using Levinson's term, as discussed in §2.4.1). Ellipsis, as in the case of Japanese, is an extreme example of this.

Hinds (1983:87) used Prince's framework (1981) of 'assumed familiarity' to explain the \textit{wa}/\textit{ga} differences, as follows:

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure3.png}
\caption{Assumed familiarity and particle selection}
\end{figure}

This Japanese version of assumed familiarity is not the best representation of the distribution of \textit{wa} and \textit{ga}, since three out of seven categories show both \textit{wa} and \textit{ga} as a possibility, so that for example, 'unused new' information can be expressed by either particle.

Watanabe (1989:162) offers a more precise representation of mental processing not only of the \textit{wa}/\textit{ga} differences but also in relation to ellipsis. The following representation of Watanabe's proposal (ibid) shows the exact and precise demarcation of the three referring expressions; 'important' refers to a referent which appears more than twice in the story regardless of its referential form:
Figure 4: Japanese grammar of referential coherence as mental processing instructions

The asterisk, *, represents the case of an indefinite but important referent which is expressed with numeral classifier, for example:

(27) 一人の男が来た。
     Hitorino otoko-ga kita.
     one person man-SB came
     'A man came.'

The wa/ga distinction has a substantial bearing on ellipsis resolution, and hence is discussed in various other sections in the thesis, particularly §3.5.2 and §6.1.

2.5.1.3 Deletion criteria

Conversations and narratives have specific directions in which they develop their stories, and these directions mirror the organising principles of cognition and memory (Hobbs 1978, Hinds 1986). Ellipsis plays a major part in the organisation of conversations and narratives in Japanese, and the use of ellipsis is affected by two factors: recoverability and cognitive state. In terms of recoverability, ellipsis sometimes takes the form of omitting every significant element of an utterance, such as topic, subject, object, case marking particles, even first mentioned nominals, so long as they are recoverable from the context (Fox 1996:14-15). The most obvious
example is that the subject of a declarative sentence is often omitted even from the start, because it is strongly identifiable as the speaker, viz. first person. Similarly, the subject of an interrogative or imperative sentence is omitted, because it is understood as a hearer, viz. second person. Statistically, Shibamoto (1983:239) has shown from her analysis of conversations that 42.8% of speakers' deletions (51% male and 34.7% female speakers) were first and second person deictic referents.

Furthermore, Hinds (1980:22) and Shibamoto (1983:249) argue that the primary motivating force in nominal ellipsis is the identification of a referent as the topic, and that ellipsis occurs when a nominal refers to a paragraph topic or part of the topic. This seems to be a widely held view in the literature. However in practice, the strategy of ellipsis does not seem as simple and clear cut as they claim.

My close examination of Shibamoto's results (1983:250) reveals evidence to the contrary of this claim. Her results show that 60.8% of overt subjects, but only 54.5% of ellipted subjects, are related to the current paragraph topic.\(^8\) In other words, ellipted subjects are related to the topic at a lower rate than overt subjects. This refutes the above claim. Within this data, not all subjects which are related to the topic are ellipted (Shibamoto does not specify whether or not the figure includes the first mentioned topic subjects), and not all ellipted subjects are related to the topic. If this result gives an accurate picture of the conditions of ellipsis, the topic does not seem to be the primary motivating force in triggering nominal ellipsis, because regardless of whether a subject is being ellipted or not, it has nearly the same chance (60.8% and 54.5%) of being related to the current topic. Thus, recoverability appears not to be the sole criterion for ellipsis. Although Hinds holds the above view, he (1978) also makes a contradicting statement to the opposite effect, namely that Japanese speakers do not delete all referents which can be understood by the context. This is where cognitive aspects come into play.

In terms of cognitive state, four factors may be relevant to why a recoverable referent is made into an overt expression rather than ellipted. Firstly and most

\(^8\) She has overlooked this critical result in her paper, as her primarily interest was the gender differences in language usage from a sociolinguistic perspective.
importantly, Clancy (1980) claims that two cognitive factors affect the choice between full NP and ellipsis: 'distance' (number of clauses between the referent and the anaphor) and 'interference' (number of other referents in the context). These factors are indeed important and constitute the basic notions 'look-back' and 'ambiguity' respectively in the study of topic continuity led by Givon (1983). Watanabe (1989) conducted a quantitative study within this framework using four stories from school texts. She reported (ibid. 189) that only 6.8% of ellipsis appeared after more than one sentence away from the referent; similarly, when there is an interference, an overt form is preferred to ellipsis. Hinds (1983:49) states that ellipsis is the unmarked form of topic continuity. Secondly, an overt expression of a recoverable nominal is used to create episode boundaries, as is the view held by Fox (1996) for English. Hinds (1986:79) offers three episode orientations as motivations for episode boundaries: participant, temporal, and spatial views of the world of the speaker. A third factor which makes a recoverable referent overt is emphasis. Fourthly, certain lexical NPs can be repeated without resorting to ellipsis. As discussed in §1.5.1.3 and §2.4.1, kinship and occupational terms and the like are frequently repeated in Japanese; the repetition of lexical NPs also occurs in English, when characteristics of objects and people are focused on.

### 2.5.1.4 Deletion principles

In this subsection, I list some deletion principles proposed in the literature.


Delete less important information first, and more important information last.

'Important' refers to 'new' and in a sense 'focused' (Kuno 1995:209). This principle is simple and plausible, but very vague.

**Deletion principle** (Mikami 1970:155):

*Topic marked referent has scope over subsequent sentences, so that the referent may be deleted upon the second mention and thereafter.*

Again, this principle is simple and certainly captures the fundamental idea of ellipsis, but it is not exact (i.e. 'may be deleted') and too simplistic. The mechanisms
of ellipsis are far more involved than this simplistic principle, as discussed earlier in this section.

While the above two principles are offered from the perspective of production, the following is from the perspective of processing.

*The major strategies for the interpretation of ellipsis* (Hinds 1982:125):

*The referent of an ellipted item is assumed to be one of the topics on the hierarchy of structures between the story line and the event line. It is the lowest topic, or part of the topic which is compatible with the markers of the propositional verbal associated with the ellipted item.*

This idea that ellipsis has a reference to a paragraph topic, or part of it, as the cue to interpreting ellipsis, has already been refuted in the previous subsection.

These three principles depict only a partial aspect of ellipsis, and are inadequate for practical applications. These principles are fully evaluated in §5.2 when the principle of argument ellipsis is proposed.

Hinds and Hinds (1979) also proposes a three-step device for determining how to refer to a topic in Japanese discourse:

1. A nominal mentioned first time is marked by *ga* and is the agent/subject.
2. Second time mentions are marked by *wa* and are the topic.
3. Third time mentions are ellipted.

In other words, it has the [NP₁-*ga* --> NP₁-*wa* --> ø] progression which has been termed the 'Paradigmatic theme progression' (Hinds 1984, Maynard 1980). This idea was disputed by Clancy and Downing (1987, using oral narrative texts) and Watanabe (1989, using written narrative texts) in quantitative studies showing that it was rare to have three consecutive mentions of the same referent at the time of introduction. Watanabe (1989:177) reorganised the Clancy and Downing's result as follows:

**Table 7: Referential progression for character introductions**

(Clancy and Downing 1987:6)

<table>
<thead>
<tr>
<th>Progression type</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>[NP-<em>ga</em> --&gt; ø]</td>
<td>104</td>
<td>77.6%</td>
</tr>
<tr>
<td>[NP-<em>ga</em> --&gt; NP-<em>ga</em>]</td>
<td>15</td>
<td>11.2</td>
</tr>
<tr>
<td>[NP-<em>ga</em> --&gt; NP-<em>wa</em>]</td>
<td>9</td>
<td>6.7</td>
</tr>
<tr>
<td>[NP-<em>wa</em> --&gt; ø]</td>
<td>6</td>
<td>4.5</td>
</tr>
</tbody>
</table>
Table 9 shows that [NP₁-ga --> ø₁] is by far the most common progression. Although the rate for the [NP₁-ga --> NP₁-wa --> ø₁] progression is not shown in the table, the fact that the [NP₁-ga --> NP₁-wa] progression only amounts to 6.7% entails that the [NP₁-ga --> NP₁-wa --> ø₁] progression is less than 6.7%, which is certainly rare. Watanabe (1989:178) explains the reasons for non-occurrence of the expected progression as follows:

Both wa and ga mark discontinuity from the immediately preceding discourse environment. Thus, it is equally possible to introduce a character either by wa or ga. However, there is a trade off between the two choices. Since the particle ga marks both an anaphoric discontinuity and a non-persistent nature, it is not preferable to introduce an important referent with ga in this respect. Rather, wa is preferable, since wa marks a persistent nature. However, one function of wa is to mark definiteness, thus for an indefinite important referent, it is not preferred to be marked by wa, even though the referent is important. On the other hand, ga marks both definite NPs and indefinite NPs, thus it is a more favoured coding device than wa for introducing indefinite referents. And, many of the first mentions of a participant in narratives are indefinite (i.e. not uniquely identifiable to the reader/hearer at the time of introduction).

I found the same phenomena in my corpus, where the progression [NP₁-ga --> NP₁-wa --> ø₁] is rare. However, among those which follow this pattern of progression, I have found a trend. The progression is found for those referents low in animacy and discourse salience, whereas for those referents high in animacy and discourse salience (see Chapter 4 for discussions of animacy and discourse salience), the progression [NP₁-ga / NP₁-wa --> ø] is common. The following is an example of the [NP₁-ga --> NP₁-wa --> ø₁] progression with the referent being an unknown person (Jinken, Seikacho Shinbun 2.1999):

(28) 両足が不自由になり、以前にやっていたロッククライミングをあきらめた人がいた。
Ryoo ashi-ga fujiyuuni nari, izen yatteita rockclimbing-o akirameta hito-ga ita.
both legs-SB disable become before doing rock-climbing-OB give up person-SB was
'There was a person who gave up rock-climbing after both of (his) legs became disabled.'

ある日、その人は、雑誌をみていたら、外国人の両足のないヒューさんが
ロッククライミングをして成功していることを知った。
Aruhi, *sono hito*-wa *zasshi*-o *miteita* ra, *gaikokujin no ryoo* *ashi no nai*

one day that person-Top magazine-OB looking when foreigner both legs Gen Neg

Hugh-san-ga *rockclimbing ni seikoo shiteiru* koto-o shitta.

Hugh-Mr-SB rock-climbing success have been Nomz-OB knew

'Hone day, that person read in a magazine that Hugh, a foreigner who had lost both legs, had succeeded in rock-climbing.'

そのことに心を打たれて、自分ももう一度自分の夢を実現させようと決心した。

*oji sono koto ni kokoro-o uta-re te, jibun mo moo ichido* jibun no yume-o

that thing by heart-OB move-Pass and self also more once self Gen dream-OB

*jitugen sase yoo to ø kesshin shita.*

come true Pass intention Comp decision did

(He) was moved by that, and (he) decided that self also wanted to try making self's dream come true.'

Referents low in animacy and discourse salience tend to go through more stages of progression. On the other hand, referents highest in animacy and discourse salience, i.e. speech act participants, can be expressed by ellipsis from the outset on the grounds that the ellipted subject of a declarative sentence is generally first person, and the ellipted subject of an interrogative or imperative sentence second person. In other words, it is plausible to assume that the lower referents are in animacy and discourse salience, the more stages of progression they go through. This generalisation is illustrated below:

Referent high in animacy and discourse salience

[ø] >>

[NP-wa --> ø] >>

[NP-ga --> ø] >>

[NP-ga --> NP-wa --> ø]

Referent low in animacy and discourse salience

Figure 5: Referential progression in relation to animacy and discourse salience

Note that this progression applies when the grammatical relations of referents are maintained. For example, when non-subject referents become subjects in the next sentence, they are often not ellipted, even if strongly identifiable (even first person).

For example, from an indirect object to subject (*Jinken, Seikacho shinbun* 2.1999):
Chapter 2

(29) 私たちにみせてくれた。私たちはただ落ちないように願っていた。

Watashi-tachi-ni mise te kureta.
1-pl-to show and gave
'(He) showed (it) to us.'

Watashi-tachi-wa tada ø ochi nai yooni neggatei-ta.
1-pl-Top simply fall Neg Purp hoping-Past
'We were simply hoping that (he) wouldn't fall.'

This is a natural consequence, because this involves a topic change and the new topic needs to be specified, even if the referent may be inferable.

Kuno (1973:223) made a related claim, namely that ellipted NPs have an underlying marking wa but never ga. Wa-marked arguments are either anaphoric or generic, and represent either old or inferable information. On the other hand, ga-marked arguments represent new information or exhaustive listings (often focused), so that they cannot be deleted.

One may wonder how it is determined whether or not the ellipted subject has a wa-marking once it is ellipted. That is a legitimate concern. I can only say that an ellipted subject is always interpreted as having a wa-marking, but cannot be interpreted as having a ga-marking, as shown in (29a):

(29a) 私たちはただ落ちないように願っていた。

(Watashi-tachi-wa/*ga) tada ø ochi nai yooni neggatei-ta.
1-pl-Top simply fall Neg Purp hoping-Past
'We were simply hoping that (he) wouldn't fall.'

2.5.2 Computational approaches: Kameyama

Computational linguistics is an interdisciplinary area between linguistics and computer science/information technology. Within this field, the study of the identification of ellipted referents has been well under way for a number of years. In dealing with ellipsis resolution in Japanese, Kameyama (1985) has proposed a comprehensive theoretically-based account, and has laid a theoretical foundation for present day research. The strength of her account is that it successfully integrates two different, but complementary, theories to deal with the complex phenomena of ellipsis resolution. Those two theories are Lexical Functional Grammar (LFG, Bresnan 1982)
to account for grammatical aspects of the phenomena and Centering Theory (Grosz, Joshi, & Weinstein 1983, 1986) to account for discourse aspects. The following descriptions of LFG in §2.5.4.1 and Centering theory in §2.5.4.2 are my summary of Kameyama (1985).

### 2.5.2.1 Lexical functional grammar

Lexical Functional Grammar is a formal theory of sentence-level grammatical mapping relations. Complex mappings mediate between c-structure and f-structure.\(^9\) C-structure is the syntactic encoding of word and phrase configurations, and f-structure is the semantic predicate-argument relationships which encode elaborate lexical entries in the form of an unordered list of attributes (e.g. Subject [SUBJ], Object [OBJ], and Predicate [PRED] which subcategorises arguments) and their actual values. For example, a Japanese sentence, *Katta* 'ø bought ø', will be represented as follows:

<table>
<thead>
<tr>
<th>c-structure</th>
<th>f-structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>SUBJ PRED 'PRO' Unexpressed +</td>
</tr>
<tr>
<td>V</td>
<td>OBJ PRED 'PRO' Unexpressed +</td>
</tr>
<tr>
<td>Katta</td>
<td>PRED 'Katta' &lt;(SUBJ) (OBJ)&gt;</td>
</tr>
</tbody>
</table>

**Figure 6: C-structure and f-structure for Katta. 'ø bought ø.'**

On the LFG account, c-structure represents only those elements which are actually expressed, hence ellipted arguments are not shown. On the other hand, f-structure lists every subcategorised argument, so that the subject and the object which the verb 'buy' subcategorises are listed there. In this example, however, the subcategorised arguments are unexpressed, i.e. ellipted, and this is noted by [Unexpressed +].

---

\(^9\) Although only c-structure and f-structure are included in Kameyama’s 1985 analysis, more recent versions of LFG also include other structures such as a-structure.
The following diagram is a list of subcategorised and non-subcategorised NPs. It locates slots, and enables us to recognise ellipses if the slots are not filled. These are classed as syntactic ellipsis and semantic ellipsis. Syntactic ellipsis applies to 'semantically unrestricted' arguments, which means that the semantic role of the argument is unrestricted so that it can be agent, patient or other thematic functions. Semantic ellipsis, on the other hand, applies to 'semantically restricted' arguments which have a particular semantic role, for example, patient, beneficiary, and location.

![Diagram of subcategorised and non-subcategorised NPs]

**Figure 7: Arguments in a proposition**

(Kameyama 1985:89)

This diagram enables us to detect the existence of ellipsis and proceeds to find candidates for the referent of an ellipted argument.

LFG Binding Theory, which identifies whether or not two NPs are coreferential, comprises three binary features:

- **[+/- ncl]**: whether or not the antecedent for the anaphor is in the same nucleus (local domain), which is the f-structure domain of a PRED and its subcategorised arguments, e.g. a clause, a possessive NP, and an adjunct phrase.
- **[+/- sb]**: whether or not the antecedent for the anaphor is a subject.
- **[+/- log]**: whether or not the description is made from the viewpoint of the protagonist.
  - [+log] using a reflexive from the viewpoint of the protagonist
  - [-log] using a pronominal from the viewpoint of the speaker (reportive)

In my opinion, Binding Theory in LFG is superior to that in GB, in that the GB version is only equipped to identify whether or not two NPs are coreferential
distributionally; and GB also has a number of unsolvable problems that were discussed in §2.4.1. Furthermore, GB exploits only one value of 'local domain' which specifies the distributional aspects of two NPs. This value tends to induce the incorrect idea of complementary distribution, which is problematic for a number of languages, including some aspects of English, as observed in §2.4.1. On the other hand, LFG not only identifies whether or not two NPs are coreferential, but also extends to describing two other core features of the antecedent, i.e. [±sb] and [±log]. These features helps tracking an antecedent, even when it is non-local (see §6.3).

The use of these three dimensions of binary features in LFG enables us to account for phenomena in a wider range of languages. Accordingly, the Japanese reflexive 'jibun' is accounted for in terms of two values; it can occur where its antecedent has either or both values of [+sb] and [+log], as shown below:

(30) [+sb]=jibun

ジョンがビルに自分のことを話した。


SB IO self Gen matter OB talked

'John talked to Bill about his matter.'

(31a) [+log]=jibun

ジョンが自分といっしょにいることが花子に安心感を与えた。

[John-ga jibun to issho-ni iru koto] ga Hanako-i ni anshinkan-o ataeta.

SB self with together is thing SB IO relief - OB gave

'John being together with (lit.) self gave Hanako a sense of relief.'

However, (31a) sounds foreign. I suspect that it is because (31a) is a constructed sentence, not a naturally occurring one. Although in (31a) the [+log] argument Hanako-ni is [-sb], within my corpus, I have found no example of arguments that are [-sb] and [+log]. Instead, the semantic content of (31a) will normally be expressed as (31b), where the antecedent of 'jibun' is both [+log] and [+sb]:

(31b) [+sb]=jibun

花子はジョンが自分といっしょにいるので安心した。

Hanako-i-wa [John-ga jibun to issho-ni iru node] anshinshita.

-SB self with together stay because relieved

'Hanako was relieved, because John was with (lit.) self.'
As ellipsis in Japanese is extremely context-dependent, the sentence-level grammar of LFG by itself is incomplete. The intersentential aspect is accounted for by Centering Theory. Thus, LFG works as an initial screening process to rule out some potential antecedents for ellipsis on a sentence level, before Centering Theory further eliminates potential antecedents for ellipsis at inter-sentential level.

2.5.2.2 Centering Theory

Centering theory was proposed by Grosz, Joshi, & Weinstein in 1983 in the form of algorithms to resolve pronominal anaphors, which in turn originated from the Centering mechanism for English discourse developed by Sidner (1981, 1983). Subsequently, Kameyama (1985) extended this concept to apply to ellipsis resolution for Japanese.

The basic terms used in Centering Theory are 'forward-looking center' (Cf) and 'backward-looking center' (Cb). Cfs and Cb are entities referred to by nominals and Cb is the centrally talked-about entity for an utterance. The theory posits that every sentence contains one or more Cfs and one or zero Cb. Zero Cb is found at a start of a conversation. One and only one Cb is selected when the same entity is mentioned in the next sentence. Any entities that are not Cbs are called Cfs.

The Centering rules which bind two NPs in adjacent clauses or sentences consist of two rules: one is 'the Center-establishment rule', which makes one of the Cfs in the previous sentence into the Cb of the current sentence, and the other is 'the Center-retention rule', where the Cb of the current sentence is the same as the Cb of the previous sentence. To establish or update a Cb, each Cf is ordered by numbers according to the likelihood of becoming the next Cb. Cf1 is the most likely Cb in the next utterance, and Cf1 is a more likely Cb than Cf2~n, etc. If there is a Cb, it is the likeliest center. So the expected center order is represented as [(Cb) > Cf1 > Cf2 > ...Cfn]. The order is determined on the basis of the hierarchy [Subject > Indirect object > Object (direct object) > Others], in descending order of preference. Under

---

10 For simplicity and because the purpose of this study is ellipted referents, Cfs and Cb are defined as nominal referents. However, strictly speaking, they can be any entities.
both center rules, every Cb should be expressed by an unstressed pronoun in English. For instance, a set of sentences in (32) are realised as (33):

(32a) Who is John waiting for? [Cb=∅, Cf1=John]  
(32b) John is waiting for Bill. [Cb=John, Cf1=Bill]  
(32c) John invited Bill to dinner. [Cb=John, Cf1=Bill, Cf2=dinner]

(33a) Who is John waiting for?  
(33b) He is waiting for Bill.  
(33c) He invited him/Bill to dinner.

In (32a), as this utterance is the start of a conversation, there is no Cb. 'John' is the only nominal in the utterance, so it is selected to be Cf1. Even if there were another nominal, it would be Cf1 anyway, because it is the subject which is the highest in the hierarchy. In (32b), the same nominal 'John' is mentioned again, so this time it is selected to be Cb. Under the center establishment rule, the second mention of 'John' in (32b), which is now the Cb, is realised as a pronominal in (33b). 'Bill' is the only other nominal in (32b), so it becomes Cf1. In (32c), the same nominal 'John' is again mentioned, so that under the center retention rule it continues to be Cb and is realised as a pronominal in (33c). Although 'Bill' is mentioned again in (33c), since Cb is limited to one under the expected center order, it is the previous Cb that gets the priority to be the next Cb. A shortcoming of the Centering rules is that they are confined to one and only one Cb. Consequently, they do not specify whether the second mention of Bill in (33c) should be or should not be a pronominal (Kameyama 1985:97).

Kameyama (1985) extended this theory to Japanese by proposing that where a referential pronoun is used in English following the Centering rules, ellipsis should be used in Japanese. In order to better account for Japanese, she added the notion of 'topic' to the expected center order: [Topic subject (TopSB) > Topic object > (non-topic) Subject > (non-topic) Object > Others]. Observe the following two short discourses (34) and (35). As with the English example (33), Cbs and Cfs are selected following the expected center order, and are noted next to the utterances. Under the
centering rules, Cbs must be expressed by ellipses. Hence, in the following examples, the second mention of Rosa is Cb and is expressed by ellipsis in (34b) and (35b):

(34a) ローザは誰を待っているの。
\begin{align*}
      & \text{Rosa-wa} \quad \text{dare-o matteiru no}.^{11} \\
      & \text{Rosa-TopSB} \quad \text{who-OB is waiting} \\
      & \text{'Who is Rosa waiting for?'}
\end{align*}

(34b) メリーを待っているのよ。
\begin{align*}
      & \emptyset \quad \text{Mary-o matteiru no yo}. \\
      & \text{SB} \quad \text{Mary-OB is waiting} \\
      & \text{'(She) is waiting for Mary.'}
\end{align*}

(35a) 誰がローザを待っているの。
\begin{align*}
      & \text{Dare-ga Rosa-o matteiru no.} \\
      & \text{who-SB Rosa-OB is waiting} \\
      & \text{'Who is waiting for Rosa?'}
\end{align*}

(35b) メリーが待っているのよ。
\begin{align*}
      & \text{Mary-ga} \quad \emptyset \quad \text{matteiru no yo.} \\
      & \text{Mary-SB} \quad \text{-OB is waiting} \\
      & \text{'Mary is waiting for (her).'}
\end{align*}

Even though both (34) and (35) have the same contents of Cb and Cf, i.e. in (34a) and (35a) \([\text{Cb}=\emptyset, \text{Cf}=\text{Rosa}]\), and in (34b) and (35b) \([\text{Cb}=\text{Rosa}, \text{Cf}=\text{Mary}]\), there is a crucial difference. In (34a), Rosa is a topicalised subject, which is the highest in the expected center order, while in (35a) Rosa is an untopicalised object which is not very high in the expected center order. This difference can give rise to different interpretations, when there is a subsequent sentence. For example, an identical sentence is added after (34b) and (35b) as (34c) and (35c) respectively. It contains two ellipses of subject and object. On its own, the added sentence could mean either 'Rosa invited Mary' or 'Mary invited Rosa'. However, the preferred reading after (34a) is Rosa as the subject, whereas after (35b) it is Mary as the subject:

(34a) ローザは誰を待っているの。
\begin{align*}
      & \text{Rosa-wa} \quad \text{dare-o matteiru no}. \\
      & \text{Rosa-TopSB} \quad \text{who-OB is waiting} \\
      & \text{'Who is Rosa waiting for?'}
\end{align*}

(34b) メリーを待っているのよ。
\begin{align*}
      & \emptyset \quad \text{Mary-o matteiru no yo.} \\
      & \text{SB} \quad \text{Mary-OB is waiting} \\
      & \text{'(She) is waiting for Mary.'}
\end{align*}

---

11 'No' is used with different functions in (34a) from (34b); in (34a) it is a question marker with a rising intonation, while in (34b) it is an assertive marker with a falling intonation. Similarly for (35a) and (35b).
'She is waiting for Mary.'

\[ (34c) \quad \text{夕食に招待したのよ。} \]
\[
\begin{array}{c}
\text{sb ob supper to invited} \quad \text{Assertive marker} \quad \text{Reportive marker}
\end{array}
\]
\['(She) invited (her) to dinner.'\]

Strong preference: 'Rosa invited Mary'
Weak preference: 'Mary invited Rosa'

\[ (35a) \quad \text{誰がローザを待っているの。} \]
\[
\begin{array}{c}
\text{who sb rosa-obj is waiting Q}
\end{array}
\]
\['Who is waiting for Rosa?'\]

\[ (35b) \quad \text{メリーが待っているのよ。} \]
\[
\begin{array}{c}
\text{mary sb -obj is waiting Assertive marker Reportive marker}
\end{array}
\]
\['Mary is waiting for (her).'\]

\[ (35c) \quad \text{夕食に招待したのよ。} \]
\[
\begin{array}{c}
\text{sb ob supper to invited Assertive marker Reportive marker}
\end{array}
\]
\['(She) invited (her) to dinner.'\]

Fairly acceptable: 'Mary invited Rosa'
Dispreferred 'Rosa invited Mary'

Following the centering retention rule for Japanese, Cb is the most likely candidate for the next Cb, so that both (34c) and (35c) should have centers expressed as [Cb=Rosa, Cf1=Mary, Cf2=dinner]. Hence, both (34c) and (35c) should have the interpretation of 'Rosa invited Mary' but not 'Mary invited Rosa'. In reality, (34c) definitely has the most likely reading of 'Rosa invited Mary', but in (35c) that reading is hard to obtain. The other interpretation of 'Mary invited Rosa' is a preferred reading. The only difference between (34) and (35) is that in (34) the Cb Rosa is the subject at the stage of establishing Cb, and in (35) the Cb Rosa is the object. This is one aspect of the Center rules which requires some modification.

Kameyama identified two factors responsible for the difference in interpretation. One is the grammatical property of being the subject/non-subject, and the other is a speaker's empathy or identification denoted by 'IDENT'. An [IDENT]-marked entity denotes what or who the speaker empathises with, while

---

12 'The speaker's identification' more or less refers to 'empathy' used by Kuno & Kaburaki (1977).
[nonIDENT] denotes entities that the speaker does not empathise with. The unmarked [IDENT] is assigned to the subject, and the marked [IDENT] is assigned to non-subject obtained by the use of particular object centering verbs, exemplified later in (36) and (37). To supplement the center retention rule, Kameyama (1986) proposed a constraint involving these two factors. This is called 'the property sharing constraint'. It says that two ellipses in adjacent sentences which co-specify the same Cb should share the same grammatical property and IDENT. There is a preference order as to what property is commonly shared between them:

<table>
<thead>
<tr>
<th>IDENT and SUBJ</th>
<th>IDENT alone</th>
<th>SUBJ alone</th>
<th>&gt; both nonIDENT and nonSUBJ</th>
<th>&gt; nonIDENT alone</th>
<th>&gt; nonSUBJ alone</th>
</tr>
</thead>
</table>

**Figure 8: Preference order of shared property**

This explains the differences in the interpretation of (34c) and (35c). The following statements show the details of the expected center order and the properties of each entity in adjacent sentences. (i) and (ii) concern example (34) for the two interpretations, and (iii) and (iv) concern example (35) for the same.

(i) Strong preference to 'Rosa invited Mary'

(34b) [Cb<Ident-SUBJ>=Rosa, Cf<nonIdent-nonSUBJ>=Mary]

(34c) [Cb<Ident-SUBJ>=Rosa, Cf<nonIdent-nonSUBJ>=Mary]

(ii) Weak preference to 'Mary invited Rosa'

(34b) [Cb<Ident-SUBJ>=Rosa, Cf<nonIdent-nonSUBJ>=Mary]

(34c) [Cb<nonIdent-nonSUBJ>=Rosa, Cf<Ident-SUBJ>=Mary]

(iii) Fairly acceptable: 'Mary invited Rosa'

(35b) [Cb<nonIdent-nonSUBJ>=Rosa, Cf<Ident-SUBJ>=Mary]

(35c) [Cb<nonIdent-nonSUBJ>=Rosa, Cf<Ident-SUBJ>=Mary]

(iv) Dispreferred: 'Rosa invited Mary'

(35b) [Cb<nonIdent-nonSUBJ>=Rosa, Cf<Ident-SUBJ>=Mary]

(35c) [Cb<Ident-SUBJ>=Rosa, Cf<nonIdent-nonSUBJ>=Mary]

In (i), the interpretation following the center retention rule is strongly preferred, because there is no change in the contents of Cb and Cf from (34b) to (34c). On the other hand, in (ii), there is a drastic change in the contents which violates the property sharing constraint, hence that interpretation is hard to obtain. In
(iii), although the actual entity of Cb changes from Rosa to Mary, this reading is preferred, because the contents of Cb are shared and the same between (35b) and (35c). Note that the Cb status of an entity is not homogeneous. Because the contents are not high in the preference order of property, i.e. [nonIdent and nonSubj], which is located fourth in the order, the interpretation in (iii) is not ‘strong’ but ‘fairly acceptable’. On the other hand, the preference in (i) is strong, because the contents are high in the preference order of property, i.e. [Ident and Subj]. Finally in (iv), although the Cb Rosa is carried over to (35c) from (35b), the change in the contents of properties makes (35c) unacceptable. Thus, it is apparent from above that when adjacent sentences share the same properties of Cb, i.e. the same properties are carried over to the next Cb, as in (i) [Ident-SUBJ] and (iii) [nonIdent-nonSUBJ], they are acceptable. However, when they completely change the properties of Cb, as in (ii) and (iv), the sentences are either unacceptable or marginal, resulting in a need for more inferences to support their interpretations.

Examples (34) and (35) show the unmarked case of [IDENT] where the subject carries [IDENT]. The following is a marked case of [IDENT] where it is the object, i.e. non-subject, that the speaker empathises with. This is obtained by using object-centering verbs, which affects the interpretation of a sentence. The following two sets of examples demonstrate two points. Firstly, the use of object-centering verbs affects the interpretation of a sentence. Secondly, Kameyama correctly formulated the preference order for the property sharing constraint; out of the two properties 'subject' and 'speaker's identification', it is identification that overrides subject. In order to show these points and to relate these issues with the previous one, I use the same examples (34) and (35) renumbered as (36) and (37) respectively. This time the object centering verb kureru (to give) is added in (36c) and (37c) instead of (34c) and (35c) respectively. Let us observe the first discourse set:

(36a) ローザは誰を持っているの。

What Kuno & Kaburaki (1977) call 'object-centered' verbs are discussed as 'inverse' verbs in §3.2.
As these examples show, the use of the object focusing verb reverses the earlier interpretations, i.e. (36c) is interpreted differently from (34c). The interpretation of (36c) is obtained, because the object centering verb places the [Ident] on the object and [Ident] takes precedence over the subject property in the interpretation. In other words, identification is shared between (36b) and (36c), although subject property is not shared. The Cb of the previous utterance (36b) is Rosa, and it appears again in (36c), so that under the center retention rule, Rosa gets the Cb again in (36c). This is expressed as [Cb<Ident-nonSUBJ>=Rosa, Cf1<nonIdent-SUBJ>=Mary], meaning that Rosa is the Cb and the speaker's empathy is on the object, i.e. Rosa is the object. Hence, the most likely interpretation of (36c) is '(Mary) invited (Rosa) to dinner.'

On the other hand with example (37), because the Cb Rosa is already the object, this time the interpretation for (37c) remains the same as (35c), i.e. [Cb<nonIdent-nonSUBJ>=Rosa, Cf<Ident-SUBJ>=Mary].

As these examples show, the use of the object focusing verb reverses the earlier interpretations, i.e. (36c) is interpreted differently from (34c). The interpretation of (36c) is obtained, because the object centering verb places the [Ident] on the object and [Ident] takes precedence over the subject property in the interpretation. In other words, identification is shared between (36b) and (36c), although subject property is not shared. The Cb of the previous utterance (36b) is Rosa, and it appears again in (36c), so that under the center retention rule, Rosa gets the Cb again in (36c). This is expressed as [Cb<Ident-nonSUBJ>=Rosa, Cf1<nonIdent-SUBJ>=Mary], meaning that Rosa is the Cb and the speaker's empathy is on the object, i.e. Rosa is the object. Hence, the most likely interpretation of (36c) is '(Mary) invited (Rosa) to dinner.'

On the other hand with example (37), because the Cb Rosa is already the object, this time the interpretation for (37c) remains the same as (35c), i.e. [Cb<nonIdent-nonSUBJ>=Rosa, Cf<Ident-SUBJ>=Mary].
2.5.2.3  Remaining issues

Kameyama (1985) states that each referent candidate selected by the Centering rules is validated by inference components, such as commonsense knowledge. However, this is not instantiated in her dissertation. In fact, her dissertation does not provide an exemplification of the entire process, i.e. starting with LFG, then onto Centering theory and final screening of inference components.

In my view, Kameyama’s account has set out a comprehensive and tenable framework for ellipsis resolution in Japanese, but there are some problems and remaining issues, which are stated below. Among the issues, (a) and (b) are raised by Kameyama (1985:290) and her statements are shown in italic.

(a) Semantic ellipsis as shown in the diagram (Figure 7 in this thesis), i.e. unexpressed obliques and complements needs clarifications: how they arise, get interpreted and dropped, and how they interact with the Center.

Semantic ellipsis is, to a great extent, identifiable from the verbal semantic attributes (discussed in §2.5.3.1 and §3.1) and the argument structures (discussed in Chapter 4). Chapter 4 will show that sentences are structured to satisfy two constraints according the content of arguments in Japanese. When a sentence violates these constraints, the sentence is restructured into a de-transitivised sentence, i.e. a transitive sentence is turned into an intransitive, so that agentive arguments are expressed as obliques, as in the case of passive constructions. In other words,
structurally intransitive sentences can subcategorise oblique agents. This behaviour is predictable, and Chapter 5 sets out a formula for argument structures, which helps us to detect semantic ellipsis.

(b) *Centering Theory cannot solve text independent uses of ellipsis, i.e. deictic, indexical, indefinite personal and general situational reference.*

This is because these referents lack antecedents. Centering theory works on the assumption that there is an overt antecedent (forward-looking entity) in the discourse. This causes another inherent problem. That is, Centering theory works in a linear fashion, so that it cannot account for cataphora (backward anaphora) where the anaphor precedes its antecedent. For example in the following, ellipsis precedes its antecedent *Hanako*:

\[(38) \text{'Because I was with (her), Hanako was relieved.'}
\]

As discussed in §1.5.1.1, deictic and indexical references involve direct perception and occur in spoken texts. Since this thesis deals with written narratives and not spoken texts, the study of deictic and indexical references has to be left for another study. Cues used in general situational reference were discussed in §1.5.1.2. Cataphora is accounted for in §3.5.2 and §6.1 with the *wa/ga* distinction. The algorithm that I propose in Chapter 7 is equipped to account for general situational reference and cataphora.

Other unsolved issues in Kameyama's work include the following.

(c) With the above reservations, Kameyama's account only deals with simple sentences. However, it does not deal adequately with complex sentences. In her more recent work, Kameyama (1998) proposes an account for intrasentential centering by breaking a complex sentence into a hierarchy of center-updating units. The account is complicated and unwieldy, requiring additional hierarchies. Above all, it is designed for English complex sentences, and does not address Japanese data.

Okumura & Tamura (1996) also argue that Centering theory does not work well for complex sentences. They suggest, as an alternative measure, that semantic
information from conjunctive particles be used to determine the coreferentiality of the two subjects in the complex sentence. However, as §2.5.3.2 will show, only some conjunctive particles can signal coreference, and even then the readings derived from conjunctive particles are only a tendency and susceptible to being overridden by other factors. I will be suggesting the switch-reference property of the *wa/ga* distinction as the solution in §3.5 in conjunction with conjunctive particles. It can identify the coreferentiality of two referents in complex sentences by itself with a high accuracy rate of 98.2% (111/113). This accuracy rate is further improved once it is combined with information from the other linguistic devices discussed in Chapter 3. These elements are all incorporated in the algorithm proposed in Chapter 7.

(d) The center retention rules with the property sharing constraint demonstrated in (34) and (35) are very convoluted to process or comprehend. Further, as pointed out earlier, the centering rules have another shortcoming. The centering rules allow only one Cb, and do not specify whether or not the second mention (of Bill in (33c)) should be a pronominal (Kameyama 1985:97). The algorithm which I am proposing in Chapter 7 offers a simple account which can handle all these issues in a unified manner.

(e) Successive/cumulative errors are reported in Okumura & Tamura (1996); when a wrong antecedent is chosen, the choice of the next antecedent is affected accordingly and tends to be incorrect, because the selection in Centering Theory is based on the previous selection for the antecedent. For example in (32c), if 'He' is incorrectly interpreted as 'John' instead of 'Bill', the next Cb may be affected and incorrectly chosen. This sort of error is possible and can become critical. The algorithm proposed in Chapter 7 is equipped so as to avoid this sort of problem by double checking the selected referent against other cues, so that this process works as filtering to eliminate incorrect selections of referent for ellipsis at each sentence level before processing the next sentence.

### 2.5.3 Approaches in machine translation systems: Nakaiwa et al.
Chapter 2

The history of machine translation systems is well summarised by Boyd (1997:8, see also Kay et al. 1994):

Research on machine translation systems goes back a long way into the fifties. At the time, mainframe computers incorporating bilingual dictionaries and a handful of rules governing word order were used to produce word-equivalent translations in the target language. From these crude beginnings, researchers went on to explore artificial intelligence and sought to create systematic methods of analysing syntax, though the vagaries of human language have prevented the long-promised breakthroughs. The development of translation between Japanese and English first started in the eighties.

Today, a number of firms, institutions, and universities are developing machine translation systems. Researchers involved in the development of machine translation systems have been predominantly computer scientists, and consequently, their prime interest is often mechanically oriented aiming at improving the accuracy rates by implementing elements which can result in high accuracy. These elements are not always based on the linguistic mechanisms of ellipsis, for example, expanding the range of search for an antecedent from one previous sentence to four (Okumura & Tamura 1996).

Machine translation systems and linguistics have thus developed along different paths, even though both are dealing with languages. As a result, it is reasonable to expect that more interdisciplinary studies will produce better outcomes. While the approaches in machine translation systems seem to lack detailed linguistic analysis, they offer what linguists lack in their studies; i.e. studies of machine translation systems deal with real texts, and large texts, of a size which is beyond manual application/analysis by humans, and hence provide a more realistic picture of language. On the other hand, accuracy rates have not been an important issue for linguists. Linguists tend to be theoretically oriented, interested in finding linguistic mechanisms, but these often lack practical applications. The way they prove their accounts is often to look manually at a relatively small corpus analysed by one or a few linguists, and some claims are made on the basis of examining constructed sentences. This can be far from an adequate reflection of real language use.
In this subsection, I review one translation system developed at NTT Communication Science Laboratories in Japan, which has a reputation for being the most comprehensive and advanced system among the available machine translation systems today. Its system is called the Automatic Language Translator - Japanese to English (ALT-J/E). A few methods have been developed in ALT-J/E: Template-based translation, Example-based translation, and Rule-based translation. Of these methods, Rule-based translation is relevant to the purpose of my thesis that investigates linguistic mechanisms for ellipsis resolution, hence it is outlined below. The following information is based mainly on the works of Nakaiwa et al. (1995, 1997) and Nakaiwa (1998).

2.5.3.1  ALT-J/E

The rule-based translation method in ALT-J/E utilises three constraints for resolving intrasentential, intersentential and extrasentential ellipses: verbal semantic attributes, conjunctive particles, and modal expressions, each of which is explained below.

1) Verbal semantic attributes (VSU)

Each verb imposes selectional restrictions on the type of arguments it takes (see §3.1 for detail). The 'Goi Taikei' Valency Dictionary (Ikehara et al. 1997) provides this information extensively; it lists valency information on the basis of the verbal predicate. It distinguishes 2700 types of semantic primitives for common nouns and 130 types of proper nouns, and it classifies each selected argument accordingly. For example, the verbal predicate atsumeru (to gather) is provided in the VD with the following information about the type of arguments that it takes.

Pattern ID: -201263-00-

N1-ga (Nom: SB) (human/organisation)
N2-o (Acc: OB) (human/organisation, concrete object, evidence)
N5-ni/e (Loc: OBL) (place)

where Nx denotes thematic roles; N1: agent, N2: patient, N3: experiencer, N4: source, N5: goal, N6: purpose, N7: result, N8: place,
Thus, the 'Goi Taikei' Valency Dictionary provides detailed information on the characteristics of arguments which a verb takes. This information enables us to narrow down the correct referent for an ellipsis from available referents.

Apart from recognising the valency information of arguments from its verbal predicate, ALT-J/E is also equipped to account for the empathy-loaded benefactive and directional verbs. For example, when 'kureru' (to give) and 'kuru' (to come) are used in sentences, the speaker shows the empathy with the object rather than the subject. Accordingly, they have a different interpretation, because empathy normally associated with the subject is with the object instead. §2.5.2 briefly discussed these verbs as object-centered verbs, and in §3.2 I discuss the verbs in detail, calling them 'inverse verbs'.

2) **Conjunctive particles**

Some conjunctive particles used in complex sentences signal whether or not the subject in the subordinate clause is coreferential with the subject in the matrix clause. This idea originated in work by Minami (1974), who divided Japanese conjunctive particles into three categories: A, such as 'nagara' (while) and 'te' (and), which tends to signal coreferentiality; B, such as 'temo' (although) and 'node' (because), which tends to signal different subjects; C, such as 'ga' (but), which signal no particular referentiality. Indeed, conjunctive particles can provide vital information for determining the referential identity of ellipsis for sentences such as the following where the use of 'nagara' correctly signals that the two subjects are coreferential:

(39) 太郎はテレビを見ながら言った。
    Taro-wa  terebi-o  mi  nagara  ø  itta.
    -Top     TV-OB  watch  while     said
    'Taro said while (hej) watched TV.'

3) **Modal expressions**

Certain modal expressions in Japanese restrict what can be the subject for the sentence. As will be explained in detail in §3.4, this restriction is due to the fact that
epistemic knowledge is grammaticalised in Japanese grammar, in that the speaker is only in a position to assert his own emotions and experience, so that when he states someone else's, he has to express them in a different way to his own. Hence, modal expressions, such as 'tai' (want to do), are strongly associated with the first person subject, as shown in (40a), while modal expressions, such as 'ta-gatteiru' (appears to want to do), is strongly associated with a non-first person subject, as shown in (40b):

(40a) 早く論文を終わらせたい。
$Hayaku$ $ronbun-o$ $owarase-tai.$
quickly thesis-OB finish-want
'(I) want to finish the thesis very soon.'

(40b) 早く論文を終わらせたがっている。
$Hayaku$ $ronbun-o$ $owarase-ta-gatteiru.$
quickly thesis-OB finish-want-appear
'(He/she wants to finish the thesis very soon.)'

Nakaiwa and Ikehara (1995) claim that the rule-based translation method with the three constraints could achieve 98% recall rate (100% precision rate), compared with 74% recall rate (89% precision rate) using the Centering Algorithm.\(^{14}\)

2.5.3.2 Problems with ALT-J/E

The 'Goi Taikei' Valency Dictionary is a truly extensive and amazing piece of work, and is extremely powerful in ellipsis resolution. It is even capable of handling erroneous sentences that humans sometimes produce. For example, in (41) drawn from the PHP corpus, the immediate interpretation for the ellipsis is that it is coreferential with the topic marked argument 'kono chuusha', namely interpreting the sentence as *'This injection works well on frail children, and (it) becomes incredibly healthy' (see §3.5). However, this reading does not fit with our knowledge of the world. Since the semantics of the verbal predicate 'michigaeru yooninaru' select a human subject, the ellipsis is interpreted as being coreferential with the oblique argument of 'frail children'. So, verbal semantics enables us to correctly interpret even erroneous sentences.

\(^{14}\) Precision rate $=$ $\frac{\text{correct} - \text{retrieved}}{\text{correct} + \text{wrong}}$  
Recall rate $=$ $\frac{\text{correct}}{\text{correct} + \text{missed retrieved}}$
この注射は体弱い子によく効いて、見違えるようになる。

This injection works well on frail children, and (those children) become incredibly healthy.

Notwithstanding the extensive valency information provided in the 'Goi Taikei' Valency Dictionary, ALT-J/E has some shortcomings and room for improvement. Below I discuss six such aspects.

Firstly, ALT-J/E is not equipped with a particular system to deal with a situation where two referents of exactly the same semantic category are available in the context. For example in the following, two referent candidates, Taro and Jiro, are possible referents of the ellipses, and they cannot be distinguished by the Valency Dictionary (example from Okumura & Tamura 1996):

Taro-wa isshookenmei benkyoo shiteita.
Jiro-ga ø koeokake temo, ø ø kizuka-nakat-ta.
'Taro was studying hard. Although Jiro spoke (to himi), (hej) didn't notice (himj).'

ALT-J/E accounts for such sentences by the readings derived from conjunctive particles; temo signals a different subject, so that it implies the ellipted subject in the matrix clause as different from the subject in the subordinate clause. However, conjunctive particles do not always provide reliable source of referent identification. This is the next problem.

The second issue has to do with conjunctive particles. For one thing, only some conjunctive particles can signal coreferentiality. For the other, even those which can predict coreferentiality can only indicate a tendency, and do not predict it accurately at all times. For example, the following sentence shows that although to (when) is normally deemed to signal a different subject, in this case the sentence has a same subject reading:

昔の子供は悪いことをすると、しかられた。
The idea that some conjunctive particles can predict coreferentiality or non-coreferentiality originated in the work of Minami (1974), as mentioned earlier. He analysed various conjunctive particles with respect to the grammatical features of subordinate clauses in which they tend to occur, for example, semantic role of the subordinate clause in relation to its matrix clause (cause, continuation of action, etc), clause-linkage, the type of subject marking (eg. \textit{wa/ga}), adverb (eg. degree, state, time, location), and predicate structure (eg. negation, passive and causative). He then classified those conjunctive particles into three classes: A, B and C. Subsequently, various studies in the area of natural language processing including Nakaiwa et al. (e.g. 1995, 1997) used these classes as a means of predicting a SS/DS (same subject/different subject) distinction: Class A for SS, Class B for DS, and Class C for neither / indifferent. Again, the SS/DS distinction brought by the conjunctive particles shows only a preference in these studies, though it can be a strong preference (see §3.5.1 for statistical aspects). Minami (1974:130) states the following (my translation), which suggests to me that it is not his intention to suggest that his study of conjunctive particles predicts the SS/DS distinction:

Some particles belong to more than one class, if they satisfy the criteria for the classes, so that for example, \textit{nagara} belongs to Class A and B. In other words, the determination of class for a particular particle is not achieved by the particle by itself, but by overall assessment of the elements of the subordinate clause in which the particle appears.

'\textit{Nagara}' is regarded as a SS marker, i.e. Class A, by Nakaiwa et al. and others, but according to Minami, it can be either Class A (SS) or Class B (DS). This aspect of conjunctive particles in relation to the SS/DS distinction is elaborated in §3.5.

The third is a problem associated with the type of texts used in the analysis. Various studies by Nakaiwa et al. are based on the corpus consisting of 3718 sentences. This is a fairly large corpus which is expected to bring an accurate understanding of mechanisms of Japanese ellipsis. However, these sentences were
selected for various reasons for their experiments in machine translation on the basis that they require no contextual information to make sense. Accordingly, the pattern of ellipsis is skewed towards intrasentential ellipsis. They are individual sentences in isolation, taken from a 'variety of texts' which includes newspaper articles, conventionalised expressions, and conversation. Consequently, the rate of ellipsis using this corpus was very low at 12.5%, compared with the rates discussed in §1.6: over 70% for conversation, 42–56% for narratives, and 27–37% for expository texts. This does not reflect naturally occurring texts. Even though Nakaiwa and Ikehara (1995) claim a 98% recall rate based on this corpus, the results may be less promising, once other texts are used.

The fourth problem concerns modal expressions. Various studies in Nakaiwa et al. have not recognised that the reading derived from modal expressions is susceptible to considerations such as empathy and the matrix/subordinate clause distinction (see §3.4.5 and §3.7). For example, -tai (conjugated as -taku in (45)) 'want' is a modal expression which restricts the subject to first person. However, this constraint is relaxed in a subordinate clause and is overridden by empathy, as shown in (44) and (45), in both of which the ellipted subject is not first person:

(44) 私に電話したいなら、番号を教えるよ。
    ø Watashi-ni denwashī tai nara, bangōo-o oshieru-yo.
    me telephone want if number-OB tell-SFP
    'If (you) want to call me, I'll tell (you my) number.'

(45) 父は私にやさしい。私にあげたくてこれを買ってきた。
    Chichi-wa watashini yasashii. ø watashi-ni age-taku te ø kore-o katte kita.
    my father-Top me kind me give-want and this-OB buy came
    'My father is kind to me. (He) wanted to give me (something) and bought this.'

Since these aspects have not been incorporated into ALT-J/E, applying it to the above sentences produced incorrect translations as follows. This is a consequence of constantly and automatically translating the subject of the modal expressions as first person:

for (44) * 'If I want to call me, I give a number instruction.'

for (45) 'My father is gentle to me. *I want to give me and have bought this.'
The fifth issue is those cases where the subject marking makes a difference in meaning. Since all three constraints in ALT-J/E are constraints placed on verbal predicates, they cannot always account for instances such as the following minimal pair of sentences representing a different meaning, where the subject marking is the only difference, even though the three constraints in ALT-J/E can often derive the correct referent:

(46a) 太郎は成長してから働いた。
Taro-iwa seichooshite kara, o i hataraita.
-Top grow up after SB worked
'Taro worked after (he) grew up.'

(46b) 太郎が成長してから働いた。
Taro-ga seichooshite kara, o j hataraita.
-SB grow up after SB worked
'(Xj) worked after Taro grew up.'

The role of the *wa/ga* distinction in determining SS/DS readings here is discussed extensively in §3.5.2.

The sixth issue is the algorithm for ellipsis resolution which Nakaiwa and Ikehara (1995:101) proposed. First, observe their algorithm:

[Step 1]
Detection of ellipses.
If they exist, examine the type of sentence that is being analysed now.
If the sentence is a complex sentence, proceed to step 2.
If the sentence is a simple unit sentence, proceed to step 3.

[Step 2]
Resolution of ellipses in a complex sentence will be conducted in the following order.
1) intrasentential resolution of ellipses using the types of conjunctive particles, verbal semantic attributes and modal expressions.
2) intrasentential resolution of ellipses using the types of conjunctive particles.
If their antecedents can be found, finish the resolution process. Else, proceed to step 3.

[Step 3]
If the sentence currently being analysed includes an embedded or quoted sentence, intrasentential resolution of ellipses using verbal semantic attributes will be conducted.
If their antecedents can be found, finish the resolution process. Else, proceed to step 4.

[Step 4]
Examine whether there are antecedents in other sentences within the text. If their antecedents can be found, finish the resolution process. Else, proceed to step 5.

[Step 5]
Extrasentential resolution of ellipses using verbal semantic attributes, modal expressions, and the types of conjunctive particles is conducted. If their antecedents can be found, finish the resolution process. Else, proceed to step 6.

[Step 6]
If referential elements cannot be found and translation in the passive voice can be done, translate it into the passive voice, else based on the semantic restrictions imposed on the ellipsis by the verbs, and deductively generate anaphora elements. Finish the resolution process.

I agree with the basic structure and procedure of the algorithm, which first detects the existence of ellipsis, then analyses in the order: complex sentences (intrasentential anaphors) > simple sentences (intersentential anaphors) > extrasentential resolution of ellipses. However, the algorithm needs to be made more explicit. For example, it should be able to account for what happens when the constraints (i.e. verbal semantic attributes, modal expressions, and conjunctive particles) predict a different referent for ellipsis. For example, as seen above, readings from conjunctive particles or modal expressions can be overridden by other mechanisms. In Chapter 7, I propose an algorithm which is more explicit and equipped not only to deal with the overriding situations, but also to double check a selected referent against other information which the sentence brings into the context.

---

1 Heath (1975) discusses only the issues of equi-NP deletion and the deletion of NPs in gerundial clauses which signal coreferentiality of the ellipsis with the matrix subject, for example, 'Hei wants Øi
to go.’ and ‘Ø\(i\) Going home, he\(i\) saw him\(j\).’ This type of ellipsis in non-finite clauses, syntactic gap dealt under control in generative grammar, is considered in the discussion of complex sentences in §3.5.
Part 2: Linguistic devices

Part 2 is devoted to demonstrating that the mechanisms with which to identify the referent for ellipted argument in Japanese consist of three tiers of linguistic devices. Chapter 3 discusses *Predicate devices*, which are morphological signals occurring predominantly on verbal predicates. Chapters 4 and 5 discuss *Sentence devices*. Chapter 4 shows that sentences are constrained to form certain structures on the basis of argument type. This leads to the discussion in Chapter 5 on the patterning of ellipsis. Chapter 6 discusses *Discourse devices*, which capture the way these sentences are sequenced and the mechanisms that govern ellipsis.
Chapter 3  *Predicate devices:*
Argument inferring morphemes

In this chapter, I discuss 'Predicate devices', one type of linguistic devices aimed at referent identification in Japanese. The predicate devices occur as various types of 'argument inferring morphemes', which are placed predominantly on verbal predicates. These morphemes can be seen as a type of cross-referencing in a broad sense, though they differ significantly from prototypical cross-referencing systems.

3.1  Verbal semantics

Although Japanese is not said to be a head marking language and its verbs show no grammaticalised subject-verb concord agreement, they display a number of cues which signal the referential identity of ellipted arguments.

First, we need to note that it is insufficient to refer to Japanese verbs as just 'verb'. It is more appropriate to refer to it as 'verbal predicate', since Japanese verbal morphology is highly agglutinating. A number of auxiliaries are placed after a verb stem, and verbs cannot stand independently without at least one such auxiliary. Auxiliaries encode a number of meanings, such as modality, honorifics, tense/aspect, negation, and voice. Auxiliaries have the following configuration, with little flexibility (Shibatani 1990:307, 'honorifics', 'polite' form and 'sentence final particles' are added by me):

```
Verb stem - causative - passive/honorifics - aspect - desiderative
- polite - negative - tense - sentence final particle
```

**Figure 9: Configuration of auxiliaries**

Adjectives in Japanese may also be used directly as predicates, and have suffixes that conjugate like verbs. The term 'verbal predicate' in Japanese accordingly includes adjectival predicates (see §4.6.1).\(^1\) In addition, as noted above, sentence final

---

\(^1\) Japanese has a part of speech called *keiyoo doosi* by the traditional Japanese grammar, for example, *suki-da* 'like' and *hazu-da* 'ought to'. *Keiyoo doosi* originated from Chinese adjectives to increase the number of Japanese adjectives, particularly of abstract concepts (Ohno 1978:94-98). It literally means 'adjectival verb', but it is also referred to in the literature as verbal noun (Martin 1975), nominal
particles are often suffixed to the verbal predicate. Sentence final particles, apart from -ka (the interrogative marker), are only found in colloquial speech, and express the speaker's subjective emotions, such as assertion, empathy, query, intention, prohibition, interjection, hence they are sometimes referred to as illocutionary particles.

3.1.1 Morphological transitive-intransitive distinctions

Japanese verbs display a morphological distinction between transitive and intransitive, where that semantic distinction exists. Some verbs such as korosu 'to kill' have only transitive forms because there is no semantically intransitive counterpart, whereas other verbs such as 'to close' and 'to break' have both transitive and intransitive meanings. The majority of the latter type of verbs, mostly punctual verbs (Tohsaku 1999:153), display the relevant morphological distinction. For instance, the transitive form simēru 'to close something' differs morphologically from its intransitive counterpart simāru 'to close'.

Thus, the morphology of the verb signals whether or not the sentence is transitive ('transitivity'), hence whether or not it has an object. This is vital information for referent identification, since a verbal predicate in Japanese can form a sentence by itself without any overt nominal arguments, as shown in the following examples. Accordingly, we can detect that the subject and the object are ellipted in

adjecive (Hinds 1986), and adjective noun (Shibatani 1990). It is noun-like in that it does not inflect, but it is adjectival in meaning, since it modifies nouns. It constitutes a predicate suffixed by the copula -da, though the copula is often omitted in colloquial conversation. In this thesis, I use the term 'adjectival noun', and the terms 'verbal predicates' or 'adjective' include adjectival nouns, even when this is not specifically stated.

There is a certain subregularity, in that although the morpheme -e- represents transitive and -a-intransitive in the pair of verbs above, in other pairs these morphemes represent opposite. There are 16 types of pairs and irregular pairs (see Hinds 1986 §2.1.3.1.2, Shibatani 1990:246, Jacobsen 1992).

'Transitivity' here is used in its original sense, rather than in the sense of 'transitivity' discussed in Hopper and Thompson (1980). The former refers to a dichotomy of whether or not a sentence is transitive purely on the basis of morpho-syntax, whereas the latter is not a dichotomy but a continuum which captures a semantic degree of transitivity.
(1) from the transitive form of the verb, and the subject is ellipted in (2) from the intransitive form of the verb.

(1) (私は戸を)開けた。
(Watashi-wa) (to-o) aketa.  
1sg-Top door-OB opened [Vt] 'I opened (the door).' 

(2) (戸が)開いた。
(To-ga) aita.  
door-SB opened [Vi] 'The door) opened.' 

Furthermore, it is a phenomenon of Japanese that the same morphological transitivity distinction is observed in some di-transitive verbs. These di-transitive verbs have counterparts, which are morphologically intransitive but syntactically transitive because they take an object argument; for example, azukeru [Vt] 'entrust something safe to someone' and azukaru [Vi] 'entrust something safe for someone' where 'something' is the object ('[Vi]' denoting a morphologically intransitive di-transitive verb). This is elaborated in §4.5.3.

In comparison, English makes only three such morphological distinctions on verbs, namely, 'fell trees' versus 'fall', 'raise the curtain' versus 'rise', and 'lay an egg' versus 'lie down' (Tohsaku 1999:145). Here transitivity is more or less determined by the existence of the surface object, so that 'opened' by itself in (1) and (2) does not specify the transitivity of the sentence in English. To take another example, a reply to the question 'what are you doing?' may be 'I am reading', which is intransitive, or 'I am reading a book', which is transitive. The morphology of the verb cannot usually show whether a sentence is transitive or not (ambitransitive verbs); the overt object is the key to determining the transitivity of the sentence in English. However, ellipsis of objects is not an issue in English, because the grammar of English does not normally allow ellipted objects, nor may a verbal predicate stand on its own, so there is no need to be able to deduce the transitivity of a sentence from the verbal morphology in English.

This phenomenon suggests another fact relating to 'functional balance' which was discussed in §1.7.3. English does not distinguish transitivity on the verb, but
there is no need to consider the possibility of ellipied objects, because ellipied objects are grammatically disallowed. Japanese, on the other hand, frequently allows ellipied objects, but the morphology of the verbs indicates whether or not the sentence contains an ellipied object, so there is no confusion about it.

The verbal transitivity distinctions discussed above hold for the native Japanese lexicon. However, Japanese has borrowed many words from other languages. These include 'Sino-Japanese' verbs from Chinese. These verbs do not make such morphological distinctions. Because the two languages are extremely different morphologically, Japanese being highly agglutinating and Chinese isolating, inflections needed to be added to the Chinese verbs for them to assimilated into and be intelligible in Japanese. As a result, the inflection bearing suffix *-suru* 'do' (expletive) has come in use, as in *benkyoo-suru* '(lit.) do some study'. The roots of Sino-Japanese verbs are in reality simply nouns which have been converted into verbs by virtue of the inflection-bearing capability of *-suru* (Jacobsen 1992:205).

These Sino-Japanese verbs, therefore, do not show the morphological distinction of transitivity. Hence, they may be transitive, intransitive, or ambitransitive, depending on their semantics (Jacobsen 1992:211). The verbs which can be used as either transitive or intransitive parallel verbs in English, in that the transitivity is determined by the presence or absence of an overt object. For example, *benkyoo-suru* '(lit.) do a study' is intransitive if it is not accompanied by an overt object. This parallels noun incorporation with an indefinite or unspecific object incorporated into the verb (see Mithun 1984). But it is transitive if it has an overt object, for example, *gengogaku-o benkyoo-suru*. 'study linguistics.'

However, there is at least the following pair of Sino-Japanese verbs which show an equivalent relation to a transitivity opposition; *hakai-suru* and *hookai-suru* both mean 'to destroy', but the former is transitive taking an object and the latter intransitive, as shown below:

\[(3a) \quad 焼物を破壊する。\]
\[\emptyset \text{Tatemono-o hakai-suru.} \]
\[\text{SB building-OB destroy} \]
\['(Someone) destroys the building.'\]
3.1.2 Selectional restrictions

The last subsection demonstrated the importance of the morphological distinction of transitivity, as it signals whether or not the sentence takes an object. This subsection discusses the importance of selectional restrictions for referent identification. Selectional restrictions not only tell us what arguments a verb selects, and often which complements and adjuncts as well, but also specifies the semantic features of each argument. For example, selectional restrictions tell us that the verb 'eat' takes a human/animate agent expressed as the subject and an edible inanimate/animate patient expressed as the object. Though selectional restrictions are probably a language universal feature, the degree of restriction and their functional usefulness may vary from one language to another.

As far as retrieving the referential identity of ellipted arguments is concerned, selectional restrictions can be a redundant source of information for non-prodrop languages such as English, since arguments are rarely ellipted. On the other hand, selectional restrictions are one of the most vital means for referent identification in Japanese. When arguments are retrievable from the verbal semantics and the context, they are often ellipted and the verbal predicate on its own forms a sentence. For example, Tabeta 'ø ate ø' is a complete sentence, if the subject and object are understood. The following table shows some examples of how selectional restrictions imposed by Japanese verbs signal the type of referents that the verbs can take (also see Kameyama 1985:206-7 for lists of subject/object control verbs):

Table 9: Verbal semantic restrictions on the type of referents

<table>
<thead>
<tr>
<th>subject of the verb</th>
<th>human</th>
<th>animate</th>
<th>inanimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>korosu 'kill'</td>
<td>korosu 'kill'</td>
<td>korosu 'kill'</td>
<td>kowasu 'break'</td>
</tr>
<tr>
<td>tureteiku 'take'</td>
<td>tureteiku 'take'</td>
<td>motteiku 'take'</td>
<td>motteiku 'take'</td>
</tr>
</tbody>
</table>
In *1, *naku is used when an action is perceived as the same action possessed by human or when an animate being is personified.

Some verbs have more restrictions or finer distinctions on the semantic attributes of arguments which they take than others. The verb for existence is one of such example. *2 is a rough and general classification, as exemplified by a minimal pair of sentences (3a) and (3b):

(3a) 公園に子供がいる/*ある。  
Kooen-ni kodomo-ga *iru/*aru.  
park-in child-SB exist  
'There are children in the park.'

(3b) 公園に噴水が*いる/ある。  
Kooen-ni funsui-ga *iru/*aru.  
park-in fountain-SB exist  
'There is a fountain in the park.'

Strictly speaking, however, the distinction between *iru and *aru is fundamentally a matter of the subject being static or dynamic, so that either form can be used in (4a) with a human subject and (5) with an inanimate subject, depending on the intended meanings:

(4a) 私に子供があいる/ある。  
Watashi-ni kodomo-ga iru/*aru.  
1sg-Obl child-SB exist  
'I have children.'

c. f. (4b) 京子どもが家にいる/*ある。  
Kyoo kodomo-ga ie-ni iru/*aru.  
today child-SB home-at exist  
'Children are at home today. (They didn't go to school.)'

(5) パトカーがいる/ある。  
Patokaa-ga iru/*aru.  
Patrol car-SB exist  
'There is a police car around.'

The subject referent *kodomo 'children' in (4a) is human, but the inanimate form of 'exist' *aru can be also used, when it conveys a static meaning of the permanent relationship that children hold to their parents. The animate form of *iru will be used, if the intended meaning is the physical existence of the children (i.e dynamic), as in (4a). In contrast, it cannot be used for (4b) and (3a) where the physical existence of
the subject is the only possible reference. Similarly, the animate form can be used for an inanimate subject. In (5), aru is used to describe the material existence of the car. On the other hand, iru is used, when 'police car' is metonymically representing police officers in the car, and the speaker is describing a car that is there at the time of speaking, but he is not so concerned about the physical existence of the car.

Interestingly in comparison to (4a), the same option does not hold when the referent is parents:

(6) 私に親がいる/*ある。
Watashi-ni oya-ga       iru / *aru.
1sg-Obl parent/s-SB    exist
'My parents are (still) alive.'

This difference may be due to the fact that there are people who do not have children, so that either iru or aru can be used, depending on the intention of the statement. On the other hand, there are no people who do not have parents, so that a sentence only concerns the physical existence of parents, hence it disallows the use of aru in (6). It is also the general experience in our world knowledge that parents die before their children, so that the physical existence of children is usually permanent during the life of the parents, whereas from the perspective of children, their statements only concern whether or not parents are (still) alive, and 'having parents', i.e. the use of aru is not an issue but a matter of course.

Thus, a more general distinction between iru and aru is about being dynamic or static respectively. These forms are also used as aspect markers. Here, the same parallel is seen; iru represents progressive aspect (dynamic) (7a), and aru perfective (static) (7b).

(7a) 掃除をしている。
Sooji-o       shite      iru.
cleaning-OB do Impf(Prog)
'(I'm) cleaning.'

(7b) 掃除をしてある。
Sooji-o        shite      aru.
cleaning-OB do   Perf

(4a) and (4b) and (6) refute the Hinds' claim (1986:139) that there is no distinction between the expression of temporary and permanent possession. Shibatani (1990:304-5) classifies the use of aru, such as (4a), as the possessive verb. See Heine (1997) for the discussion of possession.

---

4 (4a) and (4b) and (6) refute the Hinds' claim (1986:139) that there is no distinction between the expression of temporary and permanent possession. Shibatani (1990:304-5) classifies the use of aru, such as (4a), as the possessive verb. See Heine (1997) for the discussion of possession.
'(I've done the) cleaning.'

Furthermore, many Japanese verbs are homonymous, and the meanings are differentiated by the use of different Chinese characters, called kanji, which represent meanings. For example, *yameru* can have any one of the following meanings depending on the *kanji* represented: 詞める 'to quit a job', 止める 'to stop', 病める 'to be sick', and so forth.

Hence, selectional restrictions detail the semantic features of arguments that a verb selects, and this information is vital in determining the referential identity of ellipted arguments. The next subsection presents a dictionary which provides extensive valency information on Japanese verbs.

### 3.1.3 Valency dictionary

The 'Goi Taikei Valency Dictionary'\(^5\) (VD, Ikehara et al. 1997) lists valency information of 100 categories of verbs detailing the type of arguments each verb takes. It distinguishes 2700 types of semantic primitives for common nouns and 130 types of proper nouns, which are laid out in a tree structure with a maximum of 12 tiered levels, and it classifies each selected argument accordingly. For example, the verbal predicate *atsumeru* 'to gather' is provided in the VD with the following information about the arguments that *atsumeru* takes:

- N1-*ga* (Nom: SB) [human/organisation]
- N2-*o* (Acc: OB) [human/organisation, concrete object, evidence]
- N5-*ni/e* (Loc: Obli) [place]

(Pattern ID: -201263-00-)


---

\(^5\) There are other dictionaries, one of which is EDR (1989, the second edition, TR-012, *Nihon denshika jisho kenkyuusho* Japan Electric Dictionary Research Institute Ltd.). It classifies verbs according to the case particles that verbs select. Since many Japanese case particles have multifunctions, it is not equipped to provide as extensive information as the VD is. According to Teramura (1982:193), there are 33 case functions realised with only 9 case forms; *ga* (typically the nominative), *o* (typically the accusative), and *ni* (typically the dative) take most of the functions.
3.1.4 Detecting ellipsis

The first step in fulfilling the goals of this thesis is to know whether or not a sentence contains ellipsis, and only then do we proceed to finding the referential identity of the ellipsis. The information provided by the VD detects the existence of ellipsis. Ellipses are detected when the arguments which are selected by the verb are unexpressed. For example, the verb *atsumeru* selects three arguments, according to the VD: a *ga*-marked subject of human/organisation, an *o*-marked object of human/organisation, concrete object, evidence, and a *ni/e*-marked locative argument.

From this information, we know that (8) is missing the subject.

(8) 学生を教室に集めた。

*(o) Gakusei-o kyooshitu-ni atsume-ta.*

SB students-OB classroom-Loc gather-Past

'o gathered students into the classroom.'

The detection of ellipsis is elaborated in §7.1, which proposes an algorithm for referent identification.

To summarise the discussions in this section, verbal semantics in Japanese specifies the type of arguments that the verb takes in terms of transitivity, animacy distinctions, and more detailed semantic characteristics of arguments. Japanese verbs also restrict the type of arguments in terms of person (discussed in §3.2 and §3.4), and of the social relationship between the arguments (§3.3).

3.2 Inverse verbs

This section demonstrates that benefactive verbs and directional verbs in Japanese form pairs: one showing a direct alignment of arguments and the other the inverse. Direct/inverse systems are found in the Algonquian languages of North America (Heath 1976, Klaiman 1992), with the distinction between direct and inverse being based on the person/animacy hierarchy. Although this notion of direct and inverse has not previously been extended to describing the grammar of Japanese in the literature, I will show that it is highly appropriate for the task of identifying referents for ellipted arguments and constitutes one of the fundamental organising principles of Japanese grammar. In this subsection, I demonstrate that the use of
Chapter 3

these verbs is determined by the person of the arguments in the sentence, hence, it signals the referential identity of ellipted arguments. The role of direct/inverse verbs in governing sentence structure is discussed in Chapter 4.

First, I briefly review the person/animacy hierarchy before describing the use of direct/inverse verbs in Japanese:

| Person/animacy Hierarchy: Human (1 > 2 > 3) > Animate > Inanimate |
| (Simplified Silverstein's hierarchy, 1976) |

**Figure 10.1: Person/animacy hierarchy**

This person/animacy hierarchy is a simplified version of Silverstein's hierarchy, which was proposed in 1976 for describing the distribution of case marking in languages with split ergativity. This hierarchy allows implicationally universals to be set up for such as case marking, word order, and cross-referencing in a number of languages (Blake 1987:165, Hopper and Thompson 1980).

Following the terms used in the description of the Algonquian languages, when the alignment of a sentence is such that the subject is higher on the person/animacy hierarchy than the object (indirect object in the case of di-transitive), this is called 'direct alignment', while the term 'inverse alignment' is used when the subject is lower on the hierarchy than the object. This is illustrated below:

| Person/animacy Hierarchy: Human (1 > 2 > 3) > Animate > Inanimate |
| Direct alignment SB > OB > Inanimate |
| Inverse alignment SB < OB Inanimate |

**Figure 10.2: Person/animacy hierarchy with direct/inverse alignment**

---

6 According to Heath (1976:176), the direct/inverse systems found in Algonquian occur only in bound pronouns, which works on ergative marking system. The direct/inverse systems are distinguished by different parameters: pronominal inverse, word-order inverse, pragmatic inverse and semantic inverse (Givón 1994, see §4.6).

7 For current purposes, ‘direct/inverse’ is represented as being determined just in terms of the person/animacy hierarchy. However, as will be discussed in §4.7, discourse salience also plays a part in Japanese. Further, direct alignment at this stage only states that the subject is higher on the person/animacy hierarchy than the object. However, as will be discussed in §4.6.1, in low-transitive sentences the topic/dative argument must be higher than the nominative object. Moreover, the actual linear order of alignment of the arguments, i.e. SO or OS, is a critical issue and will be discussed in §4.4 and §4.9 in detail.
The distinction between inverse and direct thus provides important information about the relationship between the subject and the object in terms of the person/animacy hierarchy, and I will show in the following subsections that in Japanese this information is used to narrow down the possible referents for the ellipted arguments.

The direct-inverse distinction is morphologically marked on the verb in Algonquian. Although Japanese has no lexical marking dedicated to signalling the direct-inverse distinction, there are two, in a sense portmanteau, verbs which encode the canonical meaning of the verbs as well as the notion of inverse: the benefactive verb kureru ‘to give’ (§3.2.1) and the directional verb kuru ‘to come’ (§3.2.2). These inverse verbs are deictic in nature and specify the movement of object or action towards a higher argument. They subcategorise two arguments, source and goal. The inverse is used where the source is lower on the hierarchy than the goal, and the direct is used where the source is higher on the hierarchy than the goal. The inverse system works ego-centrically, predominantly taking the speaker as deictic centre. In other words, the inverse is centripetal, and the direct is centrifugal. Although there are only two such inverse verbs, they are highly productive, because they are also frequently suffixed to other verbs, taking on an extended use as serial verbs. In this case, these inverse verbs are bleached of their meanings ('give' and 'come') and often function more like 'inverse markers'.

In the following subsections, I demonstrate how these inverse verbs are restricted arguments that they can take in terms of the person/animacy, hence providing important information about the referential identity of ellipted arguments. This is discussed in comparison with the understanding of the issue in the current literature.

### 3.2.1 Benefactive verbs

---

8 As noted in §2.5.2, Kuno & Kaburaki (1977) call these inverse verbs 'object-centered' verbs.

9 What I call 'serial verbs' are known as hojo dooshi 'supporting verbs' or 'auxiliary verbs' in the traditional Japanese grammar. See Durie (1997) on serial verbs.
Japanese has two morphologically distinct benefactive verbs *ageru* and *kureru*, both of which mean 'to give' in English. Here, the notion of direct/inverse is useful in explaining the difference of the verbs; *ageru* represents a direct alignment and *kureru* an inverse alignment. In other words, these verbs are differentiated according to whether the subject, i.e. the giver, is higher on the person/animacy hierarchy than the indirect object, i.e. beneficiary, in which case, the direct form is used; if it is lower, the inverse form is used. Interestingly, *ageru* is written as *あげる* which literally means '(go) up' denoting a direct alignment. Paralleling this is the honorific form *kureru*, written as *下さる* which literally means '(come) down', denoting an egocentric nature of an inverse alignment. The following examples demonstrate that the Japanese benefactive verbs must correctly reflect the direct and inverse distinction, or the sentences are unacceptable. For example, (9b), (10b), and (11b) below are unacceptable, because a direct form of verb is used despite the inverse relationship between the two arguments, i.e. third person giving to first (noted by [3->1]) and second person ([3->2]).

(9a)  [1->2] Direct alignment with a direct verb

> 私はあなたにプレゼントをあげた。
> *Watashi-wa anata-ni purezento-o age-ta.*
> 1sg-Top 2sg-IO present-OB give [Direct]-Past
> 'I gave you the present.'

(9b)  [2->1] Inverse alignment with a direct verb

> あなたが私にプレゼントをあげた。
> *Anata-ga watashi-ni purezento-o age-ta.*
> 2sg-SB 1sg-IO present-OB give [Direct]-Past
> 'You gave me the present.'

(9c)  [2->1] Inverse alignment with an inverse verb

> あなたが私にプレゼントをくれた。
> *Anata-ga watashi-ni purezento-o kure-ta.*
> 2sg-SB 1sg-IO present-OB give [Inverse]-Past
> 'You gave me the present.'

(10a)  [1->3] Direct

> 私は太郎にプレゼントをあげた。
> *Watashi-wa Taro-ni purezento-o age-ta.*
> 1sg-Top Taro-IO present-OB give [Direct]-Past
> 'I gave Taro the present.'

(10b)  [3->1] Inverse alignment with a direct verb

> 太郎が私にプレゼントをあげた。
> *Taro-ga watashi-ni purezento-o age-ta.*
Chapter 3

Four issues must be considered in regard to the above examples in order to fully capture the use of the inverse form.

Firstly, the above examples cover all combinations of the subject and the object in terms of person/animacy, except the case of third person giving to another third person [3->3]. This is influenced by discourse salience, and hence is discussed later in §4.7 along with an explanation of that notion.
Secondly, given the world knowledge that inanimate arguments are rarely a giver or beneficiary, the above examples considered only animate (i.e. human and animal) arguments.\(^\text{10}\) The same reason explains why (12c) sounds strange, despite the fact that the inverse marking is correctly used for the sentence with the inverse relationship of the two arguments. The fact that (12c) is only marginally acceptable stems from the oddness of the event in terms of our world knowledge that animals do not usually give concrete objects (except for an emotional gift such as pleasure) to humans, and the unusual nature of a favour granted from an animal to a human, as is implied in the Japanese benefactive verb. This adds to a reason for the fact that an inanimate argument is rarely allowed to be the subject of transitive sentences, particularly act on a human object in Japanese (see §4.1).

Thirdly, number has no bearing on the direct/inverse relation, just as number marking is not grammaticalised in Japanese. Fourthly, the issue of empathy and in-group/out-group also has a significant bearing on the direct/inverse relation. This issue is discussed in the next subsection and in §4.10.2.

3.2.1.1 In-group and out-group

§2.4 and §2.5.2.2 discussed how the notion of empathy affects the syntax of languages in the choice of personal pronouns (ellipsis in the case of Japanese) and reflexive pronouns (Kuno 1973, Kuno & Kaburaki 1977). Empathy is the speaker's camera angle or view point, and it has a bearing on the description and syntax of the sentence. It is a psychological proximity with which the speaker views a particular referent in relation to other referents. Related to empathy is the notion of in-group

\(^{10}\) The terms 'human' and 'animate' are often used loosely and interchangeably in the literature. Although the distinction is between animate which subsumes human and animal, and inanimate, human and inanimate are used as a contrasting distinction, missing animals.

The category of non-human animates is marginal and can be problematic, in that animals elusively split between human and inanimate depending on the subjective perception of the speaker on the basis of such elements as closeness to the speaker (e.g. pet or generic reference) and size (e.g. lion or lizard). Also this dimension may be treated differently in different languages. I have found no literature specifically addressing this issue. Since currently there seems to be no strict definition which linguists follow in their work, in this thesis I loosely use the terms 'human' which may also includes some animals and 'animate' which may subsume human, except when I quote other works directly.
and out-group, which is deeply woven into the Japanese grammar. The notion of in-group and out-group is a typical case of empathy. The sense of speaker's in-group or out-group generally relates to social hierarchy, such as those relationships found in company and family (see Shibatani 1990:379 for examples of social referent terms). Hence, the notion of in-group and out-group is often systematically based on a social hierarchy and the relationship between the speaker and the referent, and therefore predictable. Nonetheless, empathy can be placed on any referent which the speaker chooses, which need not always reflect the social hierarchy, hence empathy is to some extent subjective and arbitrary.

In addition to the person/animacy hierarchy, the in-group and out-group distinction also has a bearing on the choice of direct or inverse verbs and this is grammaticalised. For example, (13) below shows that although the sentence has the direct structure of second person acting on third, the inverse form should be used. This is because family members are part of speaker's in-group, so that this third person 'my brother' is treated as first person, namely [2->1] in effect.

(13) [2->1(3)] using the inverse form
あなたが弟にプレゼントをくれた。
Anata-ga otooto-ni purezento-o kure-ta.
2sg-SB brother-IO present-OB give[Inverse]-Past
'You gave my brother the present.'

The in-group and out-group distinction is relative to the other referent in a sentence and depends on the context. For example, if (13) is uttered at home and the addressee is also a member of the family, then the direct form will be used. Similarly, the earlier example (11b) becomes acceptable, if Taro is part of the speaker's in-group, such as being a family member, and if the second person indirect object is out-group, because this situation (11b)' is effectively [1->2].

(11b) [3->2] Inverse alignment with a direct verb
太郎があなたにプレゼントをあげた。
*Taro-ga anata-ni purezento-o age-ta.
-SB 2sg-IO present-OB give[Direct]-Past
'Taro gave you the present.'

(11b)ʹ [(3)1->2]
'Taro (my husband) gave you the present.'

There is another situation where (11b)' can be acceptable even if Taro is not an in-group member. As long as the speaker views one referent as being psychologically closer to him/herself than the other arguments, and empathised with that referent, it can outrank the actual/surface person of that referent. However, such an assignment of empathy is subjective and generally unpredictable to the addressees. This topic is treated further in §3.3 in the discussion of honorification.

Some may find that the inverse alignment with two human referents not involving first person, e.g. (11b) and (13), feels not as unacceptable as that involving first person, e.g. (9b) and (10b). I suggest that the implications from the in-group and out-group distinction is largely responsible for it. The former situation is often provided with the in-group situation in the context and therefore such a sentence is acceptable, whereas the latter is very limited in overriding situation where the speaker treats him/herself as an out-group member to him/herself (see §3.4.5).

3.2.1.2 The relation of three benefactive verbs

As an alternative to the inverse form, converse verbs can be used to convey the same logical contents, though the semantic contents and the pragmatic implications may be somewhat different. Converse verbs are in relations, such as that between 'give' and 'receive' or between 'buy' and 'sell'. They reverse the subject and the object, hence offer one way of avoiding inverse alignments. For example, (14a) shows that a sentence with the converse verb *morau* 'to receive' can express the logical contents of (10b), which was unacceptable, and of (10c) which uses the inverse verb:

(14a) [1->3]

\[
\text{私は太郎にプレゼントをあげた。}
\]

\[
\text{Watashi-wa Taro-ni purezento-o morat-ta.}
\]

1sg-Top Taro-IO present-OB receive-Past

'I received the present from Taro. = Taro gave me the present.' (= 10b & 10c)

The same parallel applies to other corresponding examples, such as (11b) and (11c).
The usage of the three verbs *ageru*, *kureru*, and *morau* is difficult for learners of Japanese as a second language. Most Japanese language text books seem to bypass this issue by introducing the verbs separately at different times. Even the ones with a good deal of grammatical explanation, the explanation does not provide a relationship between the use of the three verbs explicitly, apart from social relationship of referent. For example, Tohsaku (1999:94-5) explains that in *ageru* the giver can be anyone (typically, speaker or in-group person), but the recipient cannot include the speaker; in *kureru* the recipient is the speaker or an in-group person, and the giver is socially equal or inferior to the recipient; in *morau* the recipient can be anyone, and the giver is socially equal or inferior to the recipient.

In terms of the linguistic literature, some grammarians offer a partial account by dealing with two forms of ‘give’ (Hinds 1978, Ono 1992). Some provide an account which deals with all three verbs. For example, Kuno (1973:130) and Kuno & Kaburaki (1977) give an account in terms of viewpoint / empathy, which is summarised as follows:

\[
\begin{array}{ccc}
\text{ageru} & \text{kureru} & \text{morau} \\
\text{X gives to Y} & \text{X gives to Y} & \text{X receives from Y} \\
\text{Y ≠ speaker} & \text{X ≠ speaker} & \text{Y ≠ speaker} \\
\end{array}
\]

Kuno explains that *ageru* is a favour granted by the speaker, and *kureru* a favour received by the speaker. Although Kuno's explanation is tenable and somewhat similar to Tohsaku's above, it is not fully adequate. It does not explain sentences which do not involve first person, for example, (11a, b, c), where sentences involve second person and third person. Kuno (1987:252) subsequently offers a more adequate explanation using an 'Empathy hierarchy'; *ageru* is used when the speaker's

---

11 Nine academic staff at the Japanese Program in the Melbourne Institute of Asian Languages and Societies at the University of Melbourne informed me that they have not seen a textbook that adequately explains the grammatical difference in the usage and the relationship of the three verbs.

In contrast, the aspect of different registers associated with politeness has been well noted; each of these benefactive verbs has three levels of register, for example with regard to *ageru*, *yaru* is used when the receiver is inferior to the giver, *ageru* is used when they are both equal or neutral, and *sasiageru* is used when the receiver is superior to the giver. For this reason, (12a) should be *yatta* instead of *ageta*, but *ageta* was deliberately used for simplicity to highlight the difference between the direct and inverse forms without introducing a new form. This aspect of register is related to honorifics, hence it is further discussed in §3.3.
empathy for the subject is equal to or higher than the indirect object, and *kureru* is used when the speaker's empathy for the subject is lower than the indirect object. Makino & Tsutsui (1986) offer an analogous account based on viewpoint: *ageru* takes the giver's or neutral viewpoint, while *kureru* and *morau* take the receiver's viewpoint.

In my opinion, although the notion of 'viewpoint' correctly captures the difference between the three verbs, it is rather elusive and hard to make into a concrete grammatical system, as the assignment of viewpoint is subjective and viewpoint is not directly signalled by any grammatical form or lexical marker. In other words, the empathised referent is not marked in the same manner as, for example, topics with which the topic marker is used. On the other hand, the notion of direct and inverse alignment with respect to the person/animacy hierarchy discussed in this chapter makes the mechanisms of the three benefactive verbs more concrete and makes it quite simple to deal with inclusion of the in-group/out-group distinction, as exemplified in (13). Although the arbitrary component of unsignalled empathy is still difficult to build into a system under this account, the mechanisms capture the most frequent assignment of empathy (i.e. the in-group/out-group distinction) and are much more concrete and easier for learners of Japanese and machine translation systems to understand. They simply need to follow the concrete cues of the person/animacy hierarchy and the in-group/out-group distinction, rather than the subjective notion of empathy. In addition, this single notion of direct and inverse alignment gives a unified account not only for the benefactive verbs, but also for argument structures as a whole. This is the main topic of discussion in Chapter 4.

In accordance with the notion of direct and inverse alignment, both *ageru* and *kureru* mean 'to give', and both set the giver as the subject. The difference between the two is that *ageru* is used when the giver is higher on the animacy hierarchy than the receiver (i.e. direct alignment), whereas *kureru* is used when the giver is lower on the hierarchy than the receiver (i.e. inverse alignment). Conversely, *morau* 'receive', treats the receiver as the subject. Even though the logical content of it is the same as the one expressed by the inverse form of give *kureru*, it shows a direct alignment of
arguments, i.e. Giver > Receiver. The difference of usage between them is connotative. Sentences using kureru 'give' carry a connotation of favour granted and hence gratitude, whereas sentences using morau are accompanied by a presupposition that the act of giving was initiated at the receiver's request. As will be discussed in §3.3, they are also used as an alternative to causative constructions, when the giver is superior to the receiver. The use of the three verbs is summarised below with arrows showing the direction of the thing given from the giver to the receiver:

<table>
<thead>
<tr>
<th>Verb</th>
<th>Giver</th>
<th>Receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>ageru</td>
<td>Sh</td>
<td>S_h</td>
</tr>
<tr>
<td>kureru</td>
<td>S_l</td>
<td>S_h</td>
</tr>
<tr>
<td>morau</td>
<td>S_h</td>
<td>S_l</td>
</tr>
</tbody>
</table>

'h' and 'l' denote the arguments' relative values on the person/animacy hierarchy.

Figure 11: Relation of three benefactive verbs

Figure 11 illustrates the mechanism which governs the differences between the three verbs in a simple way. The aspect of empathy is also an important element in deciding the direct/inverse alignment, hence it is elaborated further in §4.10.2.

Interestingly, sentences involving ageru and kureru 'to give' cannot be passivized. I suspect that this is because the inverse form makes passivization of the direct form ageru superfluous. On the other hand, the converse verb morau 'to receive' has a lexicalised use of passive, as shown in (15):

(15) [1->3]

Watashi-wa Taro-ni mora-ware-ta.
1sg-Top Taro-IO receive-Pass-Past
'(lit.) I was received by Taro. -> Taro adopted / married me.'

3.2.1.3 Serialised use of benefactive verbs

The benefactive verbs discussed in the preceding subsection are often used as serial verbs, being suffixed to other verbs. As commonly observed in serial verb languages, the serialised verbs are bleached in meaning, so that these benefactive verbs denote a direction of alignment and a sense of beneficiary, but they lose the
canonical meaning of act of giving and receiving. This makes the benefactive verbs function somewhat like markers denoting the direct/inverse distinction. Observe the following pairs of sentences:

(16a) [1->3]

私は太郎にお金を払ってあげた。
Watashi-wa Taro-ni okane-o harat-te-age-ta.
1sg-Top Taro-IO money-OB pay-and-give[Direct]-Past
'I paid Taro some money.'

(16b) [3->1]

太郎が私にお金を払ってくれた。
Taro-ga watashi-ni okane-o harat-te-kure-ta.
Taro-SB 1sg-IO money-OB pay-and-give[Inverse]-Past
'Taro paid me some money.'

(17a) [1->3]

私は太郎に車を買ってあげた。
Watashi-wa Taro-ni kuruma-o kat-te-age-ta.
1sg-Top Taro-IO car-OB buy and give[Direct]-Past
'I bought Taro a car.'

(17b) [3->1]

太郎が私に車を買ってくれた。
Taro-ga watashi-ni kuruma-o kat-te-kure-ta.
Taro-SB 1sg-IO car-OB buy and give[Inverse]-Past
'Taro bought me a car.'

(16a) literally means 'I gave Taro a favour by paying (him)', which simply means 'I paid him' in English. The verb ageru loses the canonical meaning of giving objects, instead it denotes that the giver is giving the favour of doing something for the receiver. The use of the direct form is, therefore, often avoided, as it sounds like the speaker is requesting appreciation and recognition from the receiver. On the other hand, the inverse form gives a connotation that the receiver appreciates the giver's favour, hence it is impolite not to use the inverse form.

This difference in the connotation is reflected in the optional use of the direct form and the obligatory nature of the serialised inverse, as illustrated in the following examples. Sentences without the direct form, as in (18a) and (19a) below, are acceptable and convey the same logical content as those with the direct form in (16a) and (17a) respectively. On the other hand, the inverse alignment should be noted; (18b) and (19b) with inverse alignment are marginal without the inverse verb.
The direction of alignment is thus noted by the inverse and optionally direct verbs in the serialised use. This information signals the relationship between the arguments in terms of the animacy hierarchy.

The following set of examples, using the verb *katta* 'bought' with different serialised benefactive verbs, show how the serialised usage of benefactive verbs changes referent:

<table>
<thead>
<tr>
<th>Buyer</th>
<th>Receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Taro-ga uma-o kat-ta.</td>
<td>Taro</td>
</tr>
<tr>
<td></td>
<td>unspecified /</td>
</tr>
<tr>
<td></td>
<td>most likely Taro</td>
</tr>
<tr>
<td>'Taro bought a horse.'</td>
<td></td>
</tr>
<tr>
<td>2) Taro-ga uma-o katte-kure-ta.</td>
<td>Not Taro</td>
</tr>
<tr>
<td></td>
<td>in-group, most likely</td>
</tr>
<tr>
<td></td>
<td>the speaker</td>
</tr>
<tr>
<td>'Taro bought a horse (for someone)'</td>
<td></td>
</tr>
<tr>
<td>3) Taro-ga uma-o katte-age-ta.</td>
<td>Not Taro</td>
</tr>
<tr>
<td></td>
<td>NFP (non first person)</td>
</tr>
<tr>
<td>'Taro bought a horse (for someone)'</td>
<td></td>
</tr>
<tr>
<td>4) Taro-ga uma-o katte-morat-ta.</td>
<td>not Taro</td>
</tr>
<tr>
<td></td>
<td>Taro</td>
</tr>
<tr>
<td>'Taro received a horse (from someone).'</td>
<td></td>
</tr>
</tbody>
</table>
These examples illustrate how the use of benefactive verbs signals the identity of referents. Consequently, when arguments are ellipted, this information significantly helps to retrieve referential identity.

### 3.2.1.4 Overtness and inverse marking

Some speakers of Japanese may find (18b) and (19b) without the inverse verb in the preceding subsection acceptable. That feeling may arise because they are acceptable, if accompanied by a sentence final particle, as in (18c), or if they form a subordinate clause, as in (18d).

(18c) 太郎が私にお金を払ったの。
\[ Taro-ga\ watashi-ni\ okane-o\ harat\-o\-ta-no. \]
\[ 'I'm telling you that Taro paid me some money.' \]

(18d) 太郎が私にお金を払ったのは ...。
\[ Taro-ga\ watashi-ni\ okane-o\ harat\-o\-ta\ no-wa\ ...... \]
\[ 'The reason why Taro paid me some money was ...' \]

Thus, the need for the inverse verb is relaxed in subordinate clauses.

What is important here in considering (18c) and (18d) as well as (18b) and (19b) is the fact that sentences without the inverse marking seem less unacceptable, when the arguments are overt, presumably because there is no confusion in understanding the logical content of the sentences. However, once arguments are ellipted, the sentence must follow the direct/inverse system. This is verified by the fact that a sentence without inverse marking is always interpreted as having direct alignment. This seems to be the nature of argument ellipsis in Japanese, and is the topic of discussion in §4.11 and Chapter 5. For example, the following sentence with ellipted arguments cannot be interpreted as inverse; namely, 'Taro paid me some money', but is interpreted only as direct 'I paid Taro some money'.

(20a) = (18b) [3->1]
(太郎が私に)お金を払った。
\[*(Taro-ga\ watashi-ni)\ okane-o\ harat\-o\-ta.\]
\[ 'I paid Taro some money.' \]
The fact that the inverse marking is strictly enforced, therefore, helps to determine the referential identity of ellipted arguments. When a sentence has an ellipted subject and an ellipted object, as in (21a), we know from the lack of an inverse verb that the sentence has the direct relationship of \( \phi_i \) (the subject) > \( \phi_j \) (the object), where \( \phi_j \) cannot be first person. On the other hand, the same sentence with an inverse verb, as in (21b), has the inverse relationship of \( \phi_i < \phi_j \), where \( \phi_i \) (the subject) cannot be first person.

(21a) Direct alignment

\[
\phi_i \quad \phi_j \quad \text{Harat-ta.}
\]

pay-Past

'\( \phi_i \) paid \( \phi_j \).' where \( \phi_i > \phi_j \)

'I paid you/him/her' or 'You paid him/her.'

(21b) Inverse alignment

\[
\phi_i \quad \phi_j \quad \text{Haratte-kure-ta.}
\]

pay-give[Inverse]-Past

'\( \phi_i \) paid \( \phi_j \).' where \( \phi_i < \phi_j \)

'He/she/you paid me/you.' or 'You paid me'

When one of the arguments is overt, however, the sentences can be acceptable in some situations, for example, as an answer to a wh-question, 'who paid me? ' (20b) and 'To whom did Taro pay?' (20c):

(20b) = (18b) [3->1]

\[
\text{Taro-ga (watashi-ni) harat-\( \bullet \)-ta.}
\]

-SB 1sg-IO pay -Past

'Taro paid (me).'

(20c) = (18b) [3->1]

\[
\text{(Taro-ga) watashi-ni harat-\( \bullet \)-ta.}
\]

-SB 1sg-IO pay -Past

'(Taro) paid me.'

The information derived from direct/inverse form of the verb is usually enough to identify the correct referents for the ellipses in a given context. Note that the given readings are subject to the notion of in-group and out-group, so that any third person in-group member may be treated as first person.

The following sentence contains all three benefactive verbs with no overt argument. It may be extremely puzzling to non-native speakers of Japanese to
determine who is doing what to whom. But such a sentence is commonly used. Following the above reasoning, there is no confusion in understanding the relationship of three ellipted arguments in the sentence.

(22) もらってあげてくれるか。
Morat-te age-te kureru-ka.
"Would (you) receive (it) from (her/him) for (me)"

Only the first verb *moratte* retains the canonical benefactive meaning of 'receive', and the other two are serialised verbs which are bleached in meaning and convey only the direction of favour granted. The first verb *moratte* signals the relationship of receiver > giver. The next verb *agete*, being the direct form, signals the relationship of giver > receiver, hence the receiver cannot be first person, i.e. the favour is granted for someone else. The third verb *kureru*, being the inverse form, signals the relationship of giver < receiver, hence the giver cannot be first person, i.e. the favour is granted for first person in most cases. In addition, since (22) is interrogative, the subject of the sentence, i.e. the receiver is likely to be second person. Hence, we derive the meaning of (22) as 'Would (you) receive (it) from (her/him) for (me)?' That is to say, the act of you receiving it does a favour to her/him, and that event does me a favour.

### 3.2.2 Directional verbs

The directional verbs *kuru* 'to come' and *iku* 'to go' parallel the benefactive verbs described in the previous subsection in terms of their function denoting the direction of alignment. But they differ in two respects from the benefactive verb; firstly there is no direct form of the directional verbs, and secondly they differ in their morpho-syntax.

First, let us consider the lack of a direct form. *Kuru* 'to come' is an inverse verb, because it is used when the source argument is lower on the hierarchy than the goal, and *iku* 'to go' is a converse verb for *kuru* because of its semantic contents. Hence, a direct form of *kuru* is lacking. This is tabulated below:

**Table 9.1 : Forms of Direct, Inverse and Converse verbs**

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Inverse</th>
<th>Converse</th>
</tr>
</thead>
<tbody>
<tr>
<td>kuru</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iku</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
There is a logical reason why no direct form of the directional verb is available. This is because of the contradiction between the selectional restrictions imposed by *kuru* and the meaning of a direct form. That is to say, the semantics of *kuru* demand movement towards the speaker or towards a referent to be higher on the hierarchy, i.e. the goal be higher than the source, which is centripetal, hence *kuru* is an inherently inverse verb. Note that the usage of coming and going in Japanese is different from English. The major difference is that in English it is goal-oriented so that movement towards a goal is 'come'. As a result, there is no restriction on the person of the argument, so that 'You come to me' is acceptable as well as 'I come to you'. In Japanese, however, the usage of directional verbs is speaker-oriented, so that physically or psychologically only movement towards the speaker (or towards the referent higher on the hierarchy) is expressed by 'come'. Hence in Japanese, it is not possible to say 'I will come to your place'; this must be expressed as 'I will go to your place', even if the addressee is at the goal; namely, *Watashi-wa* (I-Top) *anatano tokoro-e* (to your place) *kimasu/ikimasu* (*come/go*). On the other hand, a direct form means that the source argument is higher on the hierarchy than the goal argument. Hence, the semantics of *kuru* contradict the meaning of direct form, and do not allow it to have a direct counterpart.

Some may argue that the classification shown in Table 9.1 is the result of treating *kuru* 'to come' as the basic term. An alternative approach would take *iku* 'to go' as basic. The pattern would then be: *iku* (direct), no inverse, and *kuru* (converse). Under this account, *kuru* is not inverse but converse, because the meaning differs from *iku*. This view seems plausible. It satisfies the converse relation of 'come' and 'go', and satisfies the definition of direct that the source be higher than the goal.

---

12 The location of the agent (i.e. source or goal) and the time of action (i.e. at the coding time or at the reference time) are also important parameters in choosing a verb. See Fillmore (1975), Kumanoto-Healey (1983), Nakazawa (1990), Wilkins and Hill (1995) for detailed discussion.
However, this analysis is problematic because it entails treating *kuru* as the converse. The converse by definition in relation to the direct *iku* 'to go' assigns the goal to be the subject and the source to be a non-subject. As discussed earlier, unless the inverse alignment is indicated, sentences can be assumed to form a direct alignment in Japanese, and hence the converse must have the goal (the subject) higher than the source (non-subject). This is in line with the semantics of *kuru* which demands the movement towards the speaker or towards the referent higher on the hierarchy, i.e. the goal be higher than the source. However, sentences that satisfy the criteria, such as 'You come to me', show inverse alignment, which is unacceptable in Japanese. Therefore, *kuru* is not a converse verb, and consequently, we are left with the classification shown in Table 9.1.

The second difference between the directional verbs and the benefactive verbs is a morpho-syntactic one; the benefactive verbs are di-transitive, while the directional verb is intransitive. Nonetheless, the directional verbs may also subcategorise three arguments as the benefactive verbs do, namely source (Y) and goal (Z) arguments as well as things (X) that are moving; 'X go/come from Y to Z'. Because source and goal arguments are not core arguments, however, they may or may not be overt; that is to say, 'X go/come (from Y) (to Z)'. For instance, in the following minimal pair of sentences, the things that move are explicit, but the goal and source arguments are both implicit. However, the use of the converse verb in (23) implies that the source argument is higher on the hierarchy than the goal, whereas in (24) the use of the inverse form implies the reverse. Given that these are questions which necessarily assume speech act participants, the most likely interpretations for the sentences involve first person and second person, as shown:

(23) Converse: source > goal    [1->2]
    *手紙がいったか。*
    *Tegami-ga i-ta-ka.*
    'Letter-SB go[Converse]-Pt-Q
     (lit.) Did the letter go (from 1 to 2) --> Did you get a letter (from me)?'

(24) Inverse: source < goal    [3 ->2/1pl/1sg]
    *手紙がきたか。*
    *Tegami-ga ki-ta-ka.*
    'Letter-SB come[Inverse]-Pt-Q
'(lit.) Did the letter come (from 3 to 2/1pl/1sg)? -->Did you/we/I get the letter (from someone)?'

Analogous to the benefactive verbs, when the directional verb is used as a serial verb suffixed to another verb, the canonical meaning is lost and it functions to signal an alignment of arguments.13

With regard to implicitness of the direct marking discussed for the benefactive verbs, direct alignment is again semantically unmarked and virtually unmarked morphologically due to the lack of direct form in the directional verb, as shown in (25) below. On the other hand, an inverse alignment must be explicitly indicated, as shown in (26a), and an inverse alignment of arguments without the inverse marking is marginal, if not unacceptable, as shown in (26b).

(25) [1->3] Direct

Watashi-wa Taro-ni denwashi-o-ta.
1sg-Top -Obl telephone-Past
'I called Taro.'

(26a) [3->1] Inverse

Taro-ga watashi-ni denwashi-te-ki-ta.
telephone-and-come[Inverse]-Past
'Taro called me.'

(26b) [3->1] Inverse alignment with no inverse marking

?? Taro-ga watashi-ni denwashi-o-ta.
'Taro called me.'

Again, sentences like (26b) with an inverse alignment of arguments but without inverse markings seem acceptable when all arguments are overt. However, once arguments are ellipted, the sentences without inverse marking are never interpreted as having an inverse alignment and always be interpreted as having a direct alignment, as shown in (26c):

(26c) [3->1] Inverse alignment with no inverse marking

(Taro-ga watashi-ni) denwashi-o-ta.
-SB 1sg-Obl telephone-Past
* 'Taro called me.' --> 'I called Taro.'

13 The serialised usage of the directional verbs induces other functions, such change of state or aspect. For other functions, see Kumamoto-Healey (1983).
Note that scope of inverse verbs is intra-clausal and does not extend to another clause. For example, the inverse verb is used in the matrix clause of (27), but the subordinate clause is interpreted as having a direct alignment.

(27) 妻に話すと、簡単に同意してくれた。
    o o Tsuma-ni hanasu to, o o kantanni dooishi te kureta.
    SB  Gen wife-IO say when SB  IO easily agree and gave[Inverse] 'When (I) told (my) wife, (she) agreed (with me) easily.'

3.3 Honorification

Honorification is another device which indexes the type of arguments in terms of social hierarchy (e.g. employee vs employer, student vs teacher), age (e.g. child vs adult vs senior), gender, and in-group/out-group of the speaker, addressee and referents. As such, honorification is basically a pragmatically oriented socially deictic device, and works like agreement to signal the referential identity of arguments. However, this is not in terms of person and number, as in many Indo-European languages, but in terms of social categories of the speaker, addressee and referents. In a sense, every sentence is coded for honorification if we consider the lack of an honorific marking as a sign of no social hierarchical difference existing between referents, although sometimes honorification is uncoded even for respected referents.

Thus, the social hierarchical relationship between referents and speech act participants signalled by honorification helps to determine the referential identity of arguments. For example, §3.1.2 discussed the difference that motteiku is used for an inanimate object to mean '(human) takes (something)', while tureteiku selects an animate object '(human) takes (someone)'. However, tureteiku is not used with any human, but is restricted to when 'someone' is equal to or inferior to the subject referent in the social hierarchy, as shown in (28). When the person who is taken is superior to the subject in the social hierarchy, an honorific form should be used, as shown in (29).

(28) 私は弟を連れて行った。
‘I took my younger brother.’

(29) 私は先生をお連れした。

‘I took the professor.’

Honorification is manifested not only in honorific markings attached on nouns and verbal predicates (i.e. verbs, adjectives, and adjectival nouns), which are discussed in the following subsections, but also in the choice of sentence structures; the social hierarchy/relationship can restrict the type of sentence construction. For example, the causative construction can be used only when the causer is equal to or superior in social hierarchy to the causee, as shown in (30). If the causee is superior to the causer, the benefactive construction is used to convey the same proposition with the connotation that the causee has accepted the causer's request, as shown in (31).

(30) 私は弟に本を読ませた。

‘I made my younger brother read the book.’

(31) 私は母に本を読んでもらった。

‘I got my mother to read the book for me.’

Hence, the construction of sentences also signals the social relationship of arguments in the sentence. The social relationship of referents manifested in the construction of sentences, therefore, helps to determine the referential identity of ellipted arguments. Take (31) as an example. If the subject is ellipted and the donor is overt, then we know that the ellipted subject must be junior in the social hierarchy than the overt argument. This is elaborated in §3.3.1.3.

The following subsections explain honorific marking on verbal predicates (§3.3.1) and on nouns (§3.3.2).
3.3.1 Honorifics on verbal predicates

Honorifics have two subsets depending upon who the speaker directs respect towards. One is addressee-controlled honorifics (polite words, called teinei-go), in which the speaker's respect is directed to the addressee irrespective of the content of the speech. The other is referent-controlled honorifics, in which the referent is shown respect. Referent-controlled honorifics have four further subsets: 1) honorific words (sonkei-go, meaning respect words) which show the speaker's respect towards the subject referent who is never the speaker nor in-group, 2) humble words (kenjoo-go, meaning condescending words) which show the speaker's respect towards the non-subject referent, 3) self-exalting words (sondai-go) which show the speaker's respect towards himself expressed as the subject against other people, and 4) contempt words (bubetu-go) which show the speaker's contempt towards the subject referent. The latter two types are somewhat less known and less frequently used today than the first two types (Ohno 1999:170). As mentioned in §1.7.2, honorific systems were more complicated in old Japanese (Sansom 1968:76-7, Fujii 1991). The use of simpler honorifics highlights the end of the class society of the Edo period (1603-1867) (Neustupny 1974, quoted in Fujii 1991:109). The self-exalting words, which were once used to direct messages to the speaker's servants and subordinates, are no longer appropriate in today's society and are archaic. The contempt words are still in use, but considered very rude. These honorification systems are illustrated below:

![Figure 12: Honorification systems](image)

The followings are examples of each type of honorification using the same verb with subject ellipsis 'ø came':

(32a) Neutral (non-honorific)
Chapter 3

(32b)  Addressee honorifics

Ki-mashi-ta.
come-Pol-Past
'ø came.' (being polite to the addressee)

(32c)  Referent honorifics: honorific

Irasshai-mashi-ta.
come[Hon]-Pol-Past
'(Someone whom the speaker respects) came.'

(32d)  Referent honorifics: humble

Mairi-mashi-ta.
come[Humb]-Pol-Past
'(Someone lower in the social hierarchy) came
to the addressee who is shown respect.)'

(32e)  Referent honorifics: self-exalting

Ki-te-tukawashi-ta.
come-and-[SE]-Past
'(Honouree/the speaker) came (for the sake of someone junior than the
speaker).'

(32e)  Referent honorifics: contempt

Ki-yagat-ta.
come-[Con]-Past
'(Someone whom the speaker disrespects) came.'

Note that because addressee honorific and referent honorific are targeted at different
social levels of referents (though addressee and referent are often the same referent in
conversation), they can be both expressed in one sentence, as in (32c,d). For the
purpose of this thesis, which deals with the referential identification in written
narrative, addressee honorifics are not directly relevant because of the monologic
nature of most material. I focus, therefore, on referent honorifics, particularly on the
first two types: the honorific and humble forms, due to their frequent occurrence.

3.3.1.1  Subject honorifics and non-subject honorifics

There have been numerous studies on the honorific systems from a pragmatic
viewpoint, particularly in the frameworks of traditional Japanese grammar and
ethnomethodology (Matsumoto 1997:720). Harada (1976) is the first to account for
the honorific systems from a syntactic viewpoint in the generative framework, and to
treat honorifics as 'subject honorific' and humble forms as 'object honorific'. His account is basically adequate (Kuno 1987, Shibatani 1990). The 'subject honorific' is correctly termed, and has led some linguists to consider subject honorifics as providing a useful test for subjecthood (Matsumoto 1997:721). However, the 'object honorific' (i.e. the humble form) is problematic. It is not always objects that are target of respect, so that it is more appropriate to refer to these as 'non-subject honorifics'.

Although some have noted this point or used the term 'non-subject', explanations were not explicitly given (Kuno 1987, Sells and Iida 1991, Matsumoto 1997). I here address two elements that suggest why the term 'non-subject' honorific is more adequate. Firstly, the humble forms are used even in intransitive sentences where there are no objects, as shown in the following example, which is not atypical in lacking any subcategorised argument other than the subject:

(33) Mairu.  
    go[Humb]  
    '(Someone who is showing respect) goes (to someone who is shown respect.)'

In (33), the humble form is used to show respect not to the object, but to someone who is the goal. Note that, as mentioned in §3.2.2, the use of directional verbs in Japanese differs from that in English, so that (33) is better translated as '(X) come (to Y).'</br>Secondly, expressions of deference are by their nature made with human referents, i.e. between a respected person (honouree) and a respecting person (honourer), but not between a human and an inanimate object or between different objects. However, paying respect extends to things and events related to the honouree in Japanese. For example, the humble form is used when the honouree is a lexically unexpressed beneficiary of an action;

(34) 戸をお開けします。  
    To-o  o-akeshi-masu.  
    door-OB open[Humb]-Pol  
    '(Honourer) opens a door (for honouree.)'

Take another example. The following passage is always used by train conductors for ticket inspection, where the humble form is used, but the object is inanimate:

(35) 切符を拝見します。  
    Kippu-o haikenshi-masu.  
    ticket-OB look[Humb]-Pol
'(Honourer) is going to look at (his honouree's) tickets.'
--> 'Let me inspect your tickets, please.'

In (35), the humble form of the verb suggests that the ellipted subject is showing respect towards the ticket, which is non-human. According to the term 'object honorific', this interpretation should sound peculiar, but in fact it is a perfectly normal sentence. The sense of using the humble form here is to show respect towards inanimate entities which belong to or have some relation to the honouree. In this case the train conductor is paying respect to his passengers including their tickets. This is further elaborated in §3.3.2 which discusses honorific markings on nouns.

After considering these examples containing either no objects in intransitive or inanimate objects, it may be more precise and simple to treat the subject as the pivot, and refer to object honorific as 'subject humble' in contrast with 'subject honorific'. In this way, non-subjects do not need to be accounted for. In the use of the subject humble form, the subject is showing respect to someone else who is socially superior to the subject, while with subject honorifics, the subject is the one who is shown respect. Nonetheless, in this thesis I stick with the term 'non-subject honorific' (or 'humble' form) to be consistent with the term more commonly used in the literature. Note that the subject in non-subject honorific sentences is usually the speaker, but it can be the speaker's in-group.

(36) 母が参ります。
Haha-ga mairi-masu.
my mother-SB go[Humb]-Pol
'My mother will go (to someone who is socially superior to the subject and the speaker.)'

Interestingly, there are fewer distinct humble lexemes than honorific, and they have more restricted use. For example, the subject honorific form of the copula is de irassyaru, whereas there is no humble form of the copula (Martin 1964:409). As will be explained in the next subsection, honorific forms can be used in a passive

---

14 In addition, the history of the humble form o-Verb-suru (discussed in §3.3.1.2) is short. It appeared first in Tokyo dialect in the early years of the 20th century, near the end of the Meiji period (1886-1912), in contrast with the long history of the honorific o-Verb-ni-naru (Matsumoto 1997:735). Furthermore, a similar phenomenon is observed in Koreans, which shares numerous linguistic features with Japanese; it has an elaborate honorific system, but no humble forms (Martin 1964:409).
construction, whereas humble forms cannot. Overall according to Wenger (1983:283-292), 70% of verbs have honorific forms while only 36% of verbs have humble forms. Wenger (1983:293) explains why not all verbs have forms of honorification, though he does not explain why there are fewer humble forms. Honorification cannot occur, 1) unless the subject is human; this explains why there are no honorific forms for verbs such as *kooru* (to freeze) and *hoeru* (to bark); 2) on verbs that have negative connotations such as *kuiarasu* (to eat greedily).

3.3.1.2 Honorific constructions

Morpho-syntactically, there are four ways of expressing referent honorifics on verbal predicates, depending on the type of verb and the level of respect that is intended.

1) Alternation of verb form:

The following structures form honorific and humble form:

- **Honorific:** $o + \text{verb stem} + \text{ni naru}$ (inchoative).
- **Humble:** $o + \text{verb stem} + \text{suru}$ ('do').

(37a) *O-machi-ni naru.* [honorific]
*wait*
'(Honouree) waits.'

(37b) *O-machi-suru.* [humble]
'(Honourer) waits (for honouree.)

The honorific prefix *o-* can be *go-*, as shown below:

(38a) *Go-sichaku-ni naru.* [honorific]
'(Honouree) tries on (clothes)'

(38b) *Go-hookoku-suru* [humble]
'(Honourer) reports (to honouree)'

Basically, *o-* is used for Japanese native verbs and nouns (see §3.3.2), and *go-* for Sino-Japanese words.

2) Suppletive forms: different lexical items are used for some (more frequently used) verbs. For example, the following examples all mean 'ø eat':

(39) *Taberu.* [non-honorific]
'(Someone) eats.'
(40) *Meshiagaru.* [honorific]

'(Honouree) eats.'

(41) *Itadaku.* [humble]

'(Honourer) eats (something offered by an honouree, or in the presence of an honouree.)'

The following are a list of other suppletive forms of honorification:\textsuperscript{15}

**Table 10: Suppletive forms of honorification**

<table>
<thead>
<tr>
<th>Neutral</th>
<th>Honorific</th>
<th>Humble</th>
</tr>
</thead>
<tbody>
<tr>
<td>do</td>
<td>suru</td>
<td>nasaru</td>
</tr>
<tr>
<td>exist/stay</td>
<td>iru</td>
<td>irassharu/o-ide-ni-naru\textsuperscript{*1}</td>
</tr>
<tr>
<td>go</td>
<td>iku</td>
<td>irassharu/o-ide-ni-naru\textsuperscript{*1}</td>
</tr>
<tr>
<td>come</td>
<td>kuru</td>
<td>irassharu/o-ide-ni-naru\textsuperscript{*1}</td>
</tr>
<tr>
<td>say</td>
<td>iu</td>
<td>ossharu</td>
</tr>
<tr>
<td>see/look</td>
<td>miru</td>
<td>go-ran-ni-naru</td>
</tr>
<tr>
<td>ask/listen</td>
<td>kiku</td>
<td>(o-kiki-ni-naru)</td>
</tr>
<tr>
<td>know</td>
<td>shiru</td>
<td>go-zonji-da</td>
</tr>
<tr>
<td>eat/drink</td>
<td>taberu/nomu</td>
<td>meshiagaru</td>
</tr>
<tr>
<td>receive</td>
<td>morau</td>
<td>o-uketori-ni-naru</td>
</tr>
<tr>
<td>give [direct]</td>
<td>ageru</td>
<td>--- \textsuperscript{*4}</td>
</tr>
<tr>
<td>give [inverse]</td>
<td>kureru kudasaru</td>
<td>--- \textsuperscript{*5}</td>
</tr>
</tbody>
</table>

The asterisks *1,2,3 indicate distinction neutralised lexemes that are neutralised in their honorific forms; that is discussed later in this subsections. No words exist for *4 and *5. In the direct form of 'give', the subject is either the speaker or the speaker's in-group member. On the other hand, the honorific form compels the subject to be the one who is shown respect. Since the speaker or the speaker's in-group member cannot be an honouree, this would be a contradiction. Consequently, there is no form in these cases. Similarly, in the inverse form of give, the subject is an honouree, and in the humble form the subject would be the one who is showing respect; again these two factors contradict each other.

3) **Combination of 1) and 2)** (restricted to some verbs); for example:

(42) *O-meshiagari-ni naru.*

'(Someone highly respected) eats.'

\textsuperscript{15} Martin (1964:409) uses the term 'euphemistic verbs' instead of 'suppletive', and states that there are 20 or 30 such verbs, but without providing the actual verbs.
4) **Use of passive form -rare** suffixed to the verb stem displaying honorific without passive interpretation; for example:

(43) *Tabe-rare-ru.*  
'(Honouree) eats.'

There are no corresponding constructions of this type for humble forms, as mentioned earlier.

There are varying degree of deferential implications among different forms of honorification including the above four constructions. The following illustrate such degrees of deference by using the same verb 'to wait':

**[super humble]**  
(44a) *o-machi mooshi-ageru*  
[Humb]-wait say[Humb]-give  
'(Honourer) waits (for honouree).'</n

**[humbler]**  
(44b) *o-machi itasu*  
[Humb]-wait do[Humb]  
'(Honourer) waits (for honouree).'</n

**[humble]**  
(44c) *o-machi suru*  
[Humb]-wait  
'(Honourer) waits (for honouree).'</n

**[neutral]**  
(44d) *matsu*  
wait  
'(X) waits (for Y).'</n

**[honorific: respectful]**  
(44e) *mat-are-ru*  
wait-Pass  
'(Honouree) waits (for someone).'</n

**[honorific: elegant]**  
(44f) *o-machi-ni naru*  
[Hon]-wait  
'(Honouree) waits (for someone).'</n

**[honorific: exalted  used of Imperial family or sarcastic]**  
(44g) *o-machi asobasu*  
[Hon]-wait  
'(Honouree deigns to) waits (for someone).'</n
Chapter 3

Honorification is a pragmatically-oriented device in that each honorific expression can have multiple meanings depending on the context. In fact, this is a common feature of honorification based on the principle that to show respect is to be indirect in expression. For example, we have seen earlier in Table 10 that itadaku (humble) can have a number of meanings. This is mostly because it is neutralised with three non-honorific verbs taberu 'to eat', nomu 'drink', or morau 'receive'. It can also mean '(honourer) eats/drinks/receives (in the presence of honouree or the food offered/cooked/prepared by honouree).’ Analogously, irrassharu (honorific) can have any of the following interpretations depending on the context: '(Honouree) is coming/going/staying/being (there/here).’ Furthermore, one honorific construction (the fourth construction above) is achieved by suffixing rare to a verb stem. Rare can be not only honorific, but also passive, spontaneous, and can be used in the majority of potential constructions (X can ...), depending on the context. The indirectness manifested in these various ways represents difficulties for the exact translation into English. However, referent identification is grammatically explainable. This is the topic of the next subsection.

3.3.1.3 Referent identification

We have observed in a number of examples above that the usage of different honorific markings on verbal predicates is constrained. This in turn constrains the potential interpretation of referring expressions, and helps to identify referents for ellipted arguments. Honorific markings thus fulfil a type of agreement function, not in terms of person and number, as in Indo-European languages, but in terms of social hierarchy. For example, (45) is a complex sentence with two clauses, each of which consists of verbal predicates alone without overt arguments. The verbal semantics tell us what other arguments the verbs take. The use of honorific forms in the first clause (the subordinate clause) signals that it is the subject which is shown respect, while the
use of the humble form in the second clause (the matrix clause) signals that it is the
non-subject which is shown respect, hence we reach the interpretation given below:

(45) いらっしゃったら、お供します。
SB come[Hon]-when, SB with go along[Humb]-Pol
'o-tomoshi-maru.' 'When (honouree) comes, (honourer) will go along (with the honouree).'

Furthermore, as discussed in §2.5.1.2, the _wa_-marked argument can be the
subject or the object, or an oblique to a lesser extent, so that when an argument is
marked by the topic marker _wa_, the grammatical function of the argument can be
determined from that of other arguments, because they are complementary. However,
if the other argument is also ellipted, the grammatical function of the _wa_-marked
argument is neutralised. In such a case, one way of determining the grammatical
function of the _wa_-marked argument is achieved by the honorific form on the verbal
predicate, and this information can be used as a reference point to determine the
referential identity of the other argument. For example, we can tell from the
minimum pair of sentences below that the verb 'to invite' is transitive, selecting a
subject and an object, and that the overt argument _sensei_ is a respected referent.

These pieces of information are common to both sentences. But the humble form is
used in (46a), while the honorific form in (46b), and this makes a difference in
interpretation. The use of the humble form in (46a) signals that the overt argument
cannot be the subject, but the object, and the use of the honorific form in (46b) signals
that the overt argument is the subject, hence we make the following interpretations:

(46a) 先生はお招きした。 先生はお招きになった。
 Sensei-wa o-maneki-shi-ta. Sensei-wa o-maneki-ni nat-ta.
'teacher-Top invite[Humb]-Past                    [Hon]-Past
'(Honouree) invited the teacher.'                  'The teacher invited (someone).'

Honorification is a powerful device for referent identification. Hinds (1978)
believes that honorification is only used when there is a difference in social categories
between speaker, addressee or other referents, and when the speech-level is formal.
This seems tenable. However, I contend that honorific dimension is also manifested
in the absence of honorification marking, because information is still given that there
is likely to be no difference on social level between the arguments concerned. This
helps referent identification in some cases. We observed a set of examples earlier that demonstrated this point. A non-honorific verb *tureteiku* is restricted to situations where 'someone' is equal to or inferior to the subject referent in the social hierarchy, but when the person who is taken is superior to the subject in the social hierarchy, an honorific form must be used.

### 3.3.1.4 Intransitivity of honorific constructions

As discussed in §1.7.4, Japanese culture discourages direct confrontation. This is likely to have led to the tendency to express information using intransitive sentences to focus on the event, rather than using transitive sentences which highlight an agent/patient relation of the two referents. Although a transitive sentence with an ellipted subject can be seen as one means of indirect transmission, the use of intransitive sentences makes the presence of an agent even less explicit. Honorific constructions represent another such instance where transitive sentences are transformed into morphological intransitives. However, they can retain an object. The verb *machi* is transitive in Japanese, as it takes an accusative argument. In example (47), the inchoative verb *naru* 'to become', which is intransitive, is suffixed to the verb. This would normally make the sentence intransitive, but here the object is retained:

(47) 電車をお待ちになる。

*Densha-o o-machi-ni naru.*

train-OB wait[Hon] Inchoative[Vi]

'(Honouree) waits for a train.'

Thus, these intransitive structures used in honorific constructions can not only avoid expressing an agent/patient relation explicitly, but also are taken as a sign of respect. The inchoative verb *naru* implies that acts of noblemen are honorifically compared to acts of God, so that they are not willed, but they just happen! (Tokunaga 1992:134)

### 3.3.2 Honorifics on nouns
Honorification is also expressed on nouns by the honorific prefix \textit{o-} (with variants \textit{on-}, \textit{go-}, and \textit{mi-}). \textit{O-} is the most commonly used form and is generally prefixed to native Japanese nouns; \textit{go-} is the next most common and is generally prefixed to Sino-Japanese words; \textit{on-} is less common and is generally prefixed to Sino-Japanese words; and \textit{mi-} is somewhat archaic and rarely used today. Not every noun can have an honorific particle. Wenger (1983:284) states that 10-22\% (considerable variation by speakers) of nouns can have an honorific prefix. The situations which call for the use of honorific particles can be summarised as being of the four following types (Ema et al. 1977:306). Among the four types, the first use of honorific particles can provide the identity of referent.

[1-i] An entity belongs to the honouree.

Possessors are seldom overtly expressed and there are no definite/indefinite articles in Japanese (see §6.4.3). However, the use of honorific particles can compensate for the lack of possessive and specifying function of referents. For example, \textit{o-nimotsu} (honourable luggage) means 'your/his/... luggage', \textit{go-ryokoo} means 'your/his/... trip', \textit{mi-kokoro} means 'your/his/... thoughts/mind'. The exact identity of the honouree-possessors, as in (48a) talking about whose health, is context-dependent, but the possessors can never be the speaker or the speaker's in-group. By contrast, the identity of the honourer-possessors, as in (48b), is generally the speaker or in-group.

\begin{align*}
(48a) \quad & \text{お元気でいらっしゃる。} \\
& \text{O-genki de irassharu.} \\
& \text{Hon-good health Cop stay[Hon]} \\
& \text{'(The honouree / *I / *in-group) is in good health.'}
\end{align*}

\begin{align*}
(48b) \quad & \text{元気でいる。} \\
& \text{o-Genki de iru} \\
& \text{good health Cop stay} \\
& \text{'(??The honouree / I / in-group) is well.'}
\end{align*}

Hence, when an entity is possessed by an honouree, it receives an honorific prefix as well as honorific marking on the verbal predicate, as in (48a) above, (49) and (50) below.

\begin{align*}
(49) \quad & \text{お手紙を拝見する。} \\
& \text{O-tegami-o haiken-suru.} \\
& \text{Hon-letter-OB look[Humb]} \\
& \text{'(I (humbly) look at (your honourable) letter.'}
\end{align*}
(50) お荷物をおもちする。

O-nimotu-o o-mochi-suru.
Hon-luggage-OB carry[Humb]
'I (humbly) carry (your honourable) luggage.'

On the other hand, when an entity is not possessed by an honouree, as shown in (51), an honorific prefix will not be attached. However, the verbal predicate still receives an honorific marking, if the sentence implies a lexically unexpressed honouree-beneficiary of the action.

(51) 戸をお開けする。

o-To-o o-ake-suru.
doors-OB open[Humb]
'I (humbly) open the door (for the honouree).'

[1-ii] An action expressed by a noun (nominalised verb) is conducted by the honouree. For example, sensei-no o-hanasi (teacher-Gen [Hon]-talk) 'the teacher's talk' and sensei-no o-shusseki (teacher-Gen [Hon]-attendance) 'the teacher's attendance'.

[2] An entity/action has an implication to the honouree, even when it belongs to the speaker.

For example, o-tegami (honourable letter) is used when the letter is something to do with the honouree; it could be the letter that the honouree wrote, a letter sent by someone else to the honouree, or it could also be a letter written by the speaker to the honouree. In terms of action, nouns such as o-rei (honourable gratitude) implying 'my thanks to you' and go-enryo (honourable refraining) implying 'I refrain from your offer' are actions of the speaker, but these actions have some impact on his honouree.

[3] Conventional use: honorific particles used in conventional usage, such as o-hayoo (honourable-early) meaning 'good morning' and go-han (honourable-rice) meaning 'rice/meal' are no longer seen as honorific particles, but rather seen as part of set words/phrases.

[4] Addressee honorifics to show formality of speech/politeness to the addressee: for example, o-hana (flowers) and o-shokuji (meal) whose possession are not a concern. Women tend use these forms more often.

There are three further types of lexical items which reflect the identity of the referents in terms of in-group and out-group distinction. One type is the deictic
prefixes; *too*-hon-, *hei-, *setu*, for in-group use, translated into English as 'my/our', *ki-, o-, on-* for out-group use translated as 'your/his/her/their'. For example, *too-koo* (my/our school) vs *ki-koo* (your/their school). The second type is a suffix *-san/-sama* (*-sama* is more honourable than *-san*); for instance, *gakusei* meaning 'a student' is referred to as *gakusei-san* out of deference to a respected out-group person. The third type are suppletive honorific forms. The following are some examples of such honorifics:

**Table 11: Referential forms by in-group and out-group**

<table>
<thead>
<tr>
<th>in-group referent [Humb]</th>
<th>out-group referent [Hon]</th>
</tr>
</thead>
<tbody>
<tr>
<td>mother</td>
<td><em>haha</em></td>
</tr>
<tr>
<td>father</td>
<td><em>chichi</em></td>
</tr>
<tr>
<td>wife</td>
<td><em>tsuma, kanai</em></td>
</tr>
<tr>
<td>opinion</td>
<td><em>shian, iken</em></td>
</tr>
<tr>
<td>book written by</td>
<td><em>sessho</em></td>
</tr>
<tr>
<td>son</td>
<td><em>segare, musuko</em></td>
</tr>
<tr>
<td>daughter</td>
<td><em>musume</em></td>
</tr>
</tbody>
</table>

The dichotomy of in-group/out-group distinction is relative, in that the same referent can be in-group or out-group to the speaker depending on the relationship among three parties, i.e. the speaker, the addressee, and the referents. Thus, when I talk to my mother or about her with my family, 'mother' is referred to as *okaasan*, i.e. the use of out-group form, because I, as the speaker, can show respect towards her in absence of outsiders. Hence, (52) implies that the sentence is uttered at home to my family/in-group.

(52) お母さんが出かけた。

*Okaasan-ga dekake-ta.*

OG-mother[Hon]-SB go out-Past

'My mother went out.'

However, when I talk about my mother to someone outside my family, she belongs to the in-group, so that the in-group word *haha* is used. In (53), the mother is considered in-group to the speaker in relation to another referent Mrs Suzuki (out-group), the in-group term *haha* must be used and the verbal predicate also goes in line with it by using the humble form:
By the same token, someone else's mother must always be referred to by the out-group term *okaasan*.

The distinction between humble forms for in-group and honorific forms for out-group helps to determine the referential identity of ellipted arguments and arguments marked by the topic marker *wa*, which, as we have seen, neutralises the grammatical relations of arguments. For example, in (54), since the verb 'to visit' subcategorises two arguments, it has one missing argument. This means that the *wa*-marked overt argument can be the subject or the object, so that the referent of the *wa*-marked overt argument as well as the referent of the ellipted argument must be identified. The use of a humble form on the verb signals that the subject must be in-group, and the overt argument *haha* 'the mother' is in-group. So we reach the interpretation that *haha* is the subject who visits an honouree (i.e. out-group).

Before closing the discussion of honorification, I quote one sentence commonly found on a package of food addressed to customers. The sentence is relatively long, consisting of three finite clauses, but does not contain any overt human subject referents or possessors. However, it uses a range of honorification presented above, which makes the interpretation of the sentence unambiguous.

(55) 本品は製造にあたり万全を期しておりますが、万一お気付きの点がございましたら、現品を当社までお送り下さい。

*Honhin-wa  seizooni  atari  o banzen-o kishite  ori-masu  ga,  IG-goods-Top  production during SB all the care-OB pay attention exist[Humb]-Pol but  man-ichi  o-kizuki-no  ten-ga  gozai-mashi  tara, in case  Hon-notice-Gen points-SB exist[Pol]-Pol if  gen-pin-o  too-sha-made  o-okuri  kudasai. the-goods-OB  IG-company-to  Hon-send please  'We) take every caution during (our) production. However, should (you) notice (any problems about the products), please forward the goods to (our) company.'
Apart from the polite forms, the first clause uses two honorific markings; the use of the in-group (IG) prefix hon- signals that it is 'our' goods, and the use of the humble construction on the verbal predicate signals that the subject referent is the honourer (i.e. in-group). The second clause uses one honorific marking; the use of the honorific prefix o- on o-kizuki signals that the possessor is out-group. The third clause uses two honorific markings; the use of the in-group prefix too- signals that it is 'our' company, and the use of honorific construction on the verbal predicate signals that the subject referent is the honouree (i.e. out-group). Using all of this information, we arrive at the given interpretation.

3.4 Epistemic morphemes

Japanese has a rigid pragmatic constraint on subjective statements, in that the speaker is only in a position to assert his own feelings and thoughts, but he cannot describe those of others in the same way, due to the lack of direct/adequate evidence (Kamio 1979, Watanabe 1984, Aoki 1986, Iwasaki 1993, inter alia). This constraint signals that the subject in subjective statements is strongly identifiable as first person in declaratives and second person in interrogatives. Hence, when the subject is ellipted, this constraint helps to identify the referent of the ellipted subject, i.e. it distinguishes first person from non-first person in declaratives and second person from non-second person in interrogatives. This constraint is manifested in linguistic forms, and the following subsections explain the forms and devices used in Japanese to reflect the speaker's epistemic knowledge. The devices explained in the subsections are 'private predicates' (verbs, adjectives, and adjectival nouns) (§3.4.1), aspect (§3.4.2), adverbs (§3.4.3), and other epistemic morphemes (§3.4.4).

Although epistemic knowledge is not grammaticalised in English, the constraint derived from epistemic knowledge is also found in English. 'Private verbs', such as imagine, hope, plan, forget, believe, feel, are strongly associated with first person subject in declaratives and second person in interrogatives (Palmer
Furthermore, an ellipted subject in non-finite clauses is generally coreferential with the matrix subject, as shown in (56). However, when private predicates are used, it is strongly associated with the speaker regardless of who the matrix subject is, as in (57) and (58) (see also §6.4.2), analogously, sentences such as (59):

(56) ø₁ Going home,_he₁ saw John.
(57) ø₁/*₂/(*)₁ Having said that, he₁ is not going to do it.
(58) ø₁/*₂/(*)₁ Looking back at it now, John₁ was wrong.
(59) ø₁/*₂/*₃ Leaving Melbourne was sad.

3.4.1 Private predicates

Private predicates denote internal states of sentient beings, such as mental state predicates (e.g. omou 'to think' and kangaeru 'to consider'), emotive predicates (e.g. kanashii 'to be sad', kowai 'to be scared', and suki 'to like'), sensory predicates (e.g. itai 'sore' and atsui 'hot'), volitional predicates (e.g. tai 'to want'), cognitive predicates (e.g. wakaru 'to understand'), and perception predicates (e.g. miru 'to see'). When the subject in private predicates is not the speaker, it is marked in two ways: by adding a modality changing morphemes suffixed on the verb/adjective (§3.4.1.1), or by using suppletive forms of predicates (§3.4.1.2).

3.4.1.1 Modality changing morphemes

---

16 Analogously, Ross (1970) presents the following examples to show person restrictions associated with some English verbs.

(*) Am I worried?

(*) Do I suppose that I'll pass the exam?

(*) I suppose that I'll pass the exam, don't I?

(*) According to me, I'll pass this exam.

It strikes (*)John/me that Mary is going out with Bill.

It seems to (*)John/me that Mary can't keep up with it.

17 Epistemic knowledge is explicitly reflected in the conjugations of Japanese adjectives, in that private adjectives have the -shiku conjugation, while non-private (objective, describing a characteristic or state of objects) adjectives have the -ku conjugation (Ohno 1978:83-4).
When the subject in private predicates is not the speaker, one way of showing that the truth conditions of the sentence are based on the speaker's observation about others and hearsay is to suffix modality changing morphemes to the private predicates. There are a number of modality changing morphemes, and their usage depends on the amount of evidence that the speaker has and the degree of certainty that the speaker wishes to express. For denoting the speaker's observation, there are garu 'X feels like / acts like / shows a sign of' (non-evidential), daroo 'probably X will ... ', sooda (semblative) / yooda / mitai 'X appears/looks/seems to me' or 'I observe', and the like. For denoting hearsay, there are sooda / rashii / to iu kotoda, which all mean 'I hear that .. '.

The following examples illustrate how the use of sooda signals the referential identity of the subject in terms of first person versus non-first person. In declaratives, when sooda is used (60b), the subject is non-first person, whereas when sooda is not used (60a), the subject is first person. In interrogatives, the use of sooka 'Do I/someone appear/look/seem to you?' signals that the subject is non-second person (61b), and the absence of it signals that it is second person (61a). (62) shows that a sentence with third person subject without a modality changing morpheme is unacceptable (see §3.4.5 for exceptions).

(60a) うれしい。  (60b) うれしそうだ。
ø Ureshii.  ø Ureshi soo-da.
happy  happy  look-Cop
'I (am) happy.'  'Someone looks happy (to my observation)'

(61a) うれしいか。  (61b) うれしそうか。
ø Ureshii-ka.  ø Ureshi-soo-ka.
-Q  look-Q
'Are (you) happy?'  ‘Do (I/someone) look happy (to your observation)?'

(62) うれしい。

---

18 Some morphemes are suffixed to a verbal stem, for example, garu and sooda (semblative), while others take a complement clause. In this respect, sooda is tricky, in that it can be either semblative or hearsay. The former constitutes one clause where it is suffixed to the stem of the adjective, while the latter constitutes two clauses where it is suffixed to a finite form of the adjective. For example:

ø Ureshi-sooda. (semblative: one clause)
'(Someone) looks happy (to my observation)'

ø Ureshii-sooda. (hearsay: two clauses)
'(I) hear that (someone) is happy.'
3.4.1.2 Suppletive forms

Some private verbal predicates have lexically different forms to refer to non-first person subjects as opposed to first person subjects. For example, to express the speaker's feeling of happiness, *ureshii* is used, while *yorokobu* is used for a non-speaker subject, as shown in (63a) and (63b) respectively:

(63a) うれしい。  
ø *Ureshii*.  
'(1/*2/3) I am happy.'

(63b) 喜ぶ。  
ø *Yorokobu*.  
'((Someone) is happy.)'

Similarly, to express the speaker's intention, *tsumori* is used, as shown in (64a). *Tsumori* cannot be used for a non-speaker subject, unless the speaker has a strong evidence for someone else's intention or plans, for example, the speaker is witnessing with his own eyes that the person is packing up and ready to leave, then it can be third person, or second person in interrogatives as in (64b). Instead, *hazu* 'must / expected' is used to express the speaker's judgement of the non-speaker subject's intention or plans, as shown in (64c).

(64a) 日本に行くつもりだ。  
ø Nihon-ni iku *tsumori* da.  
Japan-to go intend Cop  
'(1/*2/3) intend to go to Japan.'

(64b) 日本に行くつもりか。  
ø Nihon-ni iku *tsumori* ka.  
Japan-to go intend Q  
'(*1/*2/*3) intend to go to Japan?'

(64c) 日本に行くはずだ。  
ø Nihon-ni iku *hazu* da.  
'(*1/*2/3) must be going to Japan.'

Some private verbal predicates can only be used for first person subjects and do not have corresponding forms referring to non-third person subjects. For example, *temiru* 'to try to do something', can only refer to a first person subject in declaratives (65a), and second person in interrogatives (65b). No lexical item exists for a third person subject to express the equivalent meaning.
Chapter 3

(65a) 食べてみる。
    ø Tabe-temiru.
    '(1/*2/*3) try to eat (it).'</n
(65b) 食べてみるか。
    ø Tabe-temiru ka.
    'Do (*1/2/*3) want to try eating (it)?'

Similarly, for stating one's desire (hereafter, only declaratives are discussed),

* tai 'to want to do something' is only used for first person subject, but not for non-first
person subject:

(66) 日本に行きたい。
    ø Nihon-ni iki-tai.
    Japan-to go-want
    '(1/*2/*3) want to go to Japan.'

The following set of examples explicitly use three such private verbs that can
only refer to first person subjects: *tsumori* (marking the speaker's intention, as seen
above) in (67a), -*oo* (the speaker's volitional auxiliary verb) in (67b), and *omou* (a
mental state verb 'to think') in (67b) and (76c). The examples show that although the
subjects are ellipted, the identity of the subjects is reflected in the verbal predicates,
because the predicates are constrained by epistemic knowledge. If the subject in the
subordinate clause in (67b) (i.e. who is going) is third person, the meaning is
expressed as (67c), though (67c) is not restricted to a third person subject. As
mentioned earlier, (67a) can have a third person subject reading in limited context.

(67a) 行くつもりだ。
    ø Iku *tsumori* da.
    SB go intention Cop
    '(1/*2/*3) intend to go.'

(67b) 行こうと思う。
    ø Ik-oo to ø omou.
    SB go-Voli Comp SB think
    '(I) think (1/*2/*3) will go.'

(67c) 行くと思う。
    ø Ik-oo to ø omou.
    SB go Comp SB think
    '(I think (1/2/3) will go.'

3.4.2 Aspect
Aspect sometimes plays a role in person restriction. The following minimal pair of sentences shows that the use of imperfective forms (68a) signals that the subject is non-first person, while the use of perfective (68b) signals that the subject is first person, despite the fact that the action of 'saying' has been completed, i.e. it is a past event conducted prior to the utterance, in both sentences (examples from Iwasaki, 1993:33).

**Past event**

(68a) ひどいことを言う。  (68b) ひどいことを言った。

\[ ø \text{ Hidoi koto-o } \text{i-u.} \quad ø \text{ Hidoi koto-o } \text{i-ta.} \]

\begin{align*}
\text{terrible thing-OB say-Impf} & \quad \text{say-Perf} \\
'(\text{Someone}) \text{ said a terrible thing.}' & \quad '(\text{I}) \text{ said a terrible thing.}'
\end{align*}

This difference in interpretation is explicated using the same constraint, namely that the speaker can assert his own action and this is reflected in the use of the perfective aspect (68b), but not about others' reflected in the use of the imperfective aspect (68a) which depicts only a part of the whole event.19

A similar phenomenon is observed in the description of present events using different forms of imperfective aspect. Even though (69a) and (69b) describe the same present event, (69a) with teiru has a non-first person subject, while (69b) with -u has a first person subject. Teiru generally represents progressive and durative (dynamic rather than static) states (see Comrie 1976). In (69a), the use of teiru represents capturing a part of the state and the speaker's uncertainty of the relevant truth conditions, hence the subject of 'think' is not first person. By contrast, the use of -u in (69b) represents a more assertive meaning, and hence has a first person interpretation.

**Present event**

(69a) ジョンは行くと思っている。

\[ John-wa ø \text{ iku to omot-teiru.} \]

\begin{align*}
-\text{Top go Comp think [Impf: temporary state]} \\
'\text{John thinks that (he/someone) will go.}' & \quad \text{OR '}(\text{Someone}) \text{ thinks that John will go.'}
\end{align*}

Iwasaki (1993:40) describes the constructions above as tense. As stated earlier, the morphological distinction between tense and aspect has been lost in modern Japanese.
ジョンは行くと思う。
(I think that John will go.)

These two sets of minimal pairs of sentences illustrate how the use of less perfective forms in (68a) and (69a) conveys uncertainty of the whole event, hence signalling that the subject is non-first person.

The subject of komaru 'annoyed/troubled' is seldom overt, and non-native speakers of Japanese often misunderstand the subject referent. The following example shows that komaru is a private verb that has first person as the default subject (the example from Mizutani 1995:38; see §3.4.4 for the reason why the subject in the subordinate clause is non-first person):

ちっとも勉強しなくて、困るんです。
('Because (*I/someone) doesn’t study at all, (I/ *he) am troubled by that.)

When komaru is used for a non-first person subject, it must be suffixed by the imperfect aspect marker (71a), or a modality changing morpheme (71b), both (71c), or the sentence is unacceptable (71d):

Komat-teiru.
'(I/Someone) be in trouble.'

Komaru-yooda.
'It appears that (someone) is (/will be) in trouble.'

Komat-teiru-yooda.
'It appears that (someone) is in trouble (right now).'

* Komaru.
'(Someone) is in trouble.'

Note that although the subject of komoru cannot be non-first person, as shown in (71d), the use of imperfective in (71a) does not necessarily license a non-first person subject, as it can be a first person subject. The use of teiru for first person subject denotes the present temporal/uncertain state of the speaker's emotion. Further, noun phrases using komaru represent an interesting case. (72a), using the perfective aspect, has first person as the subject, as in the given translation. This is often
misinterpreted by non-native speakers of Japanese as 'My son is in trouble.' If that was the intended meaning, it would be expressed as (72b) by the use of imperfective.

(72a) 困った息子  
*Komat-ta musuko*  
troubled-Perf son[IG]  
'(I am) troubled (by my) son'

(72b) 困っている息子  
*Komat-teiru musuko*  
troubled-Impf son[IG]  
'(My) son (is in trouble)'

This set of examples illustrates, as in the earlier examples, that the use of the less perfective form signals that the subject of the private predicate is non-first person.

The following summarises my description so far (the examples are not exhaustive, see Kuroda 1965): 

**Table 12: Summary of referent reflection on verbal predicates**

<table>
<thead>
<tr>
<th>1st person</th>
<th>2nd person &amp; affirmative</th>
<th>2nd person Q</th>
<th>3rd person affirmative</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1] Private verbal predicates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;Modality changing ‘cold’ morphemes&gt;</td>
<td>samui</td>
<td>samui? samu-soo/garu</td>
<td></td>
</tr>
<tr>
<td>&lt;Suppletive forms&gt; ‘happy’</td>
<td>ureshii ureshii?</td>
<td>yorokobu</td>
<td></td>
</tr>
</tbody>
</table>

Before moving on to the next subsection, I present an example which relates the epistemic morphemes to the honorifics. Recall the person restriction that some private predicates can only be used for first person subjects, such as -tai ‘want to do something’. Presumably as a result, those private predicates cannot be used with subject honorifics, even if they are accompanied by other modality changing morphemes which signal a non-first person subject, as shown in (73a). Instead, the logical content is rephrased as (73b) using a non-private verb (Mizutani 1995:188). These constraints, therefore, help to retrieve referents of arguments, when the arguments are ellipted.

(73a) 社長が会いたがっている。  
* Shachchoo-ga ai-ta-gat-teiru.  
company president-SB see-want-appear-Impf  
'(Our) president wants to see (someone).'

*
3.4.3 Mimetic adverbs

Mimetic adverbs are used pervasively in colloquial Japanese. They are classified into three types: auditory (phonomimes), visual (phenomimes), and affective (psychomimes) (Hirose 1981:3, quoted in Aoki 1986:227). The third type denotes sensations, such as irritation and pain (e.g. chikuchiku 'prick', gangan 'pounding (of headache)') which can be reported first hand only by the experiencer, i.e. the speaker (Aoki 1986:227). The following examples show that mimetic adverbs can only be used for first person subject and cannot be used for non-first person subject (74), even if the verb is accompanied by modality changing morphemes (75), but it is acceptable if accompanied by a hearsay marker (76) (examples from Aoki 1986:228):

(74) ずきずきいたい。
ø Zukizuki itai.
'throbbing painful
'(1/*2/*3 have) a throbbing pain.'

(75) 太郎はずきずきいたがっている。
* Taro-wa zukizuki ita-gatte-iru.
-Top throbbing painful-appear-Impf
'Taro has a throbbing pain.'

(76) 太郎はずきずきいたいらしい。
Taro-wa zukizuki itai-rashii.
-Top throbbing painful-hearsay
'(I) hear that Taro has a throbbing pain.'

3.4.4 Other epistemic morphemes

The semantics of auxiliary verbs can also have a bearing on the referential identity of arguments. Below are some minimal pairs of sentences. They are identical except for the auxiliary verbs, and this difference gives rise to differences in interpretation. For example, volition expressed by auxiliary verb -oo is strongly associated with the speaker as the subject, as explained earlier. This makes a difference in interpretation, in that in (77a), marked as volitional, the ellipted subject
is first person, while in (77b) it is a non-first person. Note also that kana 'I wonder' indicates wondering by the speaker.

(77a) なんて言おうかな。
Nante i-oo kana
what say-VolI wonder
'(lit.) I wonder what (I) am going to say. --> What should I say?'

(77b) なんて言うかな。
Nante iu kana
what say I wonder
'I wonder what (someone) is going to say.'

The sentences below are both hortative denoting the speaker's request/initiation to the addressees. However, the interpretation is different due to the use of different auxiliary verbs: shoo in (78a) and sen in (78b).

(78a) 行きましょうか。
ø Iki ma-shoo-ka.
go Pol-let us-Q
'Shall we go?'

(78b) 行きませんか。
ø Iki ma-sen-ka.
go Pol-Neg-Q
'Aren't you going (with me)? / Why don't you go (with me)!='

In (79a), e is a potential form denoting one's capability, and this leads to the given interpretation. On the other hand, structurally similar sentence (79b) has a different interpretation from (79a); (79b) asks the addressee whether or not they should get someone to do something for them, i.e. it involves three referents.

(79a) 行っていただけませんか。
ø It-te itadak-e masu-ka.
go-and receive[Hon]-can Pol-Q
'Could you go (there for me),'

(79b) 行っていただきますか。
ø It-te itadaki masu-ka.
go-and receive[Hon] Pol-Q
'Shall (we) get (someone) to go (there for us),'

In relation to potential forms, the earlier example using the private verb komaru has a different subject in the subordinate clause, when the verbal predicate in the subordinate clause (80a) changes to a potential form (80b). Again, this is because the capability is a private matter which can be known only by the self/experiencer, hence it is strongly associated with the speaker.
There are expressions which restrict the identity of referents. The following pair of sentences show that the use of shi-te makes the difference in the referent identification. The reasons for the difference in identification are provided in (52a,b) §4.8.

(81a) 電話ください。
    Denwa kudasai.
    'Please give me a call.'

(81b) 電話してください。
    Denwashi-te kudasai
    telephone-and give please
    'Please give someone/(me) a call.'

Furthermore, (82) shows that an expression -hooga ii 'had better do ...' denotes the speaker's assertive suggestion to others, hence the given interpretation is reached.

Even though syntactically the sentence does not seem to have missing arguments, when it is translated into English, two subjects must be supplemented:

(82) 言ったほうがいい。
    It-ta hoo-ga ii.
    go-Perf direction-SB better
    '(lit.) Going is better.  --> (I suggest you'd) better go.'

The following set of sentences also show that yooni suru is used with the meaning '(I) make sure that .. .' Here, the matrix subject is strongly associated with the speaker for both sentences. However, the transitivity of the verbs in the subordinate clauses gives rise to a different interpretation for the subordinate subjects; the subordinate subject is strongly associated with non-first person in (83a) with an intransitive verb, while it is first person in (83b) with a transitive verb. Hence, we can reach the given interpretation, even though the actual sentences specify none of the arguments overtly.
Chapter 3

3.4.5 Neutralising elements

We have observed a number of linguistic means by which a first person subject is differentiated from a non-first person subject. However, the elements reflecting epistemic knowledge can be neutralised in three situations: in past tense, in subordinate clauses, and with empathy phenomena. For example, it was explained in §3.4.1.2 that tumori in (84a) has a first person subject, while hazu in (84b) has a non-first person subject. However, in the past tense, the subject can be any person for either of the verbs, as shown in (84c).

(84a) 日本に行くつもりだ。 (84b) 日本に行くはずだ。

ο Nihon-ni iku tumori da. ο Nihon-ni iku hazu da.
Japan-to go intend Cop
'(1/2/3) am going to Japan.' '(*1/2/3) is going to Japan.'

(84c) 日本に行くつもり/はずだった。

ο Nihon-ni iku tumori/hazu dat-ta.
Japan-to go intend Cop-Past
'(1/2/3) was going to go to Japan.'

20 Watanabe (1984:246) states an analogous point. She (1984:248) also makes an interesting point concerning evidential with the following examples - 'The internal state is not controllable by the agent, but the agent can control the outward manifestation of his internal state. Whether or not one is in a certain internal state is somehow a separate question from one's outward manifestation of that internal state.'

-Top thunder-SB afraid-Past but thunder-OB afraid-show-Neg-Past
'Masao was afraid of thunder, but (he) didn't show fear of thunder.'
Similarly, the private predicate *ureshii* 'happy' can refer to a non-first person subject in the past tense (85a) and in a subordinate clause (85b):

(85a) 太郎はうれしかった。
_Taro-wa  ureshikat-
-Top  happy-Past
‘Taro was happy.’

(85b) 太郎はうれしいのに、それを隠そうとしている。
_Taro-wa ureshii noni,  sore-o  kakus-oo to       shi-teiru.
happy  despite  it-OB  hide-Voli  Comp  doing-Impf
‘Even though Taro is happy, he is trying to hide it.’

(85b) involves a number of neutralised elements. Apart from the private predicate *ureshii* used in the subordinate clause to refer to third person subject, -oo denoting one's volition is strongly associated with first person subject. However, the complementiser -to denotes that the clause involving -oo is a quote appearing in the subordinate clause, and hence the subject of the volition can be non-first person. On the other hand, *teiru* shows an imperfective aspect, which is associated with a non-first person subject. This is in line with the other person-inferring morphemes in the sentence which indicate that the ellipted subject is *Taro*, because *teiru* appears in the predicate of the matrix clause and does not the past tense.

The above examples are basically cases of third person subjects marked with first person inferring morphemes. This is commonly found in novels where the speaker states sentences as an omniscient narrator, and when the speaker is reporting and quoting. There are also cases of the opposite situation, i.e. where third person inferring morphemes are used for first person. The speaker's empathy has a bearing on this neutralisation. Although the speaker's empathy is placed most easily on the speaker (see Kuno 1987 for 'Speech act participant empathy hierarchy'), when it is placed on others, the morphemes signalling third person subject can be used with first person subjects. The following is such an example. (86a) presents a canonical case where the use of third person inferring morpheme *-garu* signals a non-first person subject. On the other hand, (86b) is different from (86a) only in having the inverse verb *kureru*, which signals the object to be someone high in the person/animacy hierarchy (see §3.2.1), mostly likely the speaker or his in-group, and which places the
speaker's empathy on the object. This difference leads to a difference in the referent
where -garu has a first person subject.

(86a) 寒かったので、戸を閉めた。
         Samu-gat-ta node, to-o shime-ta.
    cold-appear-Past because door-OB close-Past
         'Because (someone) appeared cold, (I) closed the door'

(86b) 寒かったので、戸を閉めてくれた。
         Samu-gat-ta node, to-o shime-te kure-ta.
    cold-appear-Past because door-OB close-and give[Inverse]-Past
         'Because (I) appeared cold, (someone) closed the door (for me).'

Watanabe (1984:248) presents three other instances where -garu can be used
to refer to first person: (1) the speaker is observing himself in a mirror, as shown in
(87), (2) recalling his past experience (88), or (3) asking the addressee about the
speaker's external manifestation of his internal state (89).

(87) 私は雷を恐がっている自分を鏡の中に発見した。
         Watashi-wa kaminari-o kowa-gat-teiru jibun-o kagami-no naka-ni hakkenshi-ta.
    1sg-Top thunder-OB afraid-appear-doing self-OB mirror-Gen inside-Loc discover-Past
         'I found myself being afraid of thunder in the mirror.'

(88) 子供の頃、私は雷を恐がった。
         Kodomo no koro, watashi-wa kaminari-o kowa-gat-ta.
    child Gen time 1sg-Top thunder-OB afraid-appear-Past
         'When I was a child, I was afraid of thunder.'

(89) 私が雷を恐がっているように見えますか。
         Watashi-ga kaminari-o kowa-gat-teiru yooni mi-e-masu-ka.
    1sg-SB thunder-OB afraid-appear-doing Comp look-able-Pol-Q
         'Do I look like I'm afraid of thunder?'

Person-reflection is also neutralised in nominalisation with no specific referent
(90), where garu is not restricted to a third person subject, and in conditional
sentences (91), where tai is not restricted to a first person subject. (91) is also
associated with empathy that the second person subject is empathised.

(90) 寒いのはおかしい。
         Samu-garu no wa okashii.
    cold-appear Nomz Top strange
         'Feeling cold is strange.'

(91) もっと見たいなら、また明日来てください。
         Motto mi-tai nara, mata ashita ki-te kudasai.
    more see-want if again tomorrow come-and please
         'If (you) wanted to see (it), please come again tomorrow.'
Thus, person restrictions on private predicates derived from epistemic knowledge have a bearing on the referent identification, but the use of this is limited by its susceptibility to neutralisation by some elements.

3.5 Switch-reference properties of complex sentences

Switch-reference is a syntactic mechanism used to indicate whether the subject of a dependent clause is the same as or different from the subject of the main clause in complex sentences or clause chaining. The following minimal pair of examples from Mojave (Munro 1980:145) illustrates the canonical function of switch-reference systems:

(92a) nya-isvar-\textit{k}, iima-k.  
\> when-sing-SS, dance-Past  
\> ‘When X sang, X danced.’

(92b) nya-isvar-\textit{m}, iima-k.  
\> when-sing-DS, dance-Past  
\> ‘When X sang, Y danced.’

The marker -\textit{k} in (92a) signals Same-Subject (SS), that is, the subject of the marked clause is the same as the subject of the main clause. On the other hand, the marker -\textit{m} in (92b) signals Different-Subject (DS).

Switch-reference is recognised as one of the reference-tracking devices that identify or signal the referent NP (Heath 1983, Haiman and Munro 1983, Foley and Van Valin 1984, Stirling 1993, §2.2). Hence, it is a powerful means of determining the identity of ellided subjects within a complex sentence, particularly in a language like Japanese which frequently elides subjects. Although Japanese is not formally known as a switch-reference language, it possesses typical typological features of switch-reference languages, such as being verb final and having clause-chaining. Indeed, Akiba (1977), Myhill and Hibiya (1988), Fujii (1991), Iwasaki (1993) and Watanabe (1994) discuss aspects of switch-reference properties which exist in Japanese. They claim that a number of conjunctive particles function as switch-reference markers. This is presented in §3.5.1. My analysis also shows that the interaction of the nominative case marker \textit{ga} and the topic marker \textit{wa} in complex
sentences also displays a property analogous to switch-reference systems, one which accurately predicts a SS/DS reading. This is explained in §3.5.2. Although switch-reference systems only predict the identity of subjects in terms of same or different, this is an important means, since in Japanese subject ellipsis is by far most common (§1.6.2), and the identification of subject ellipsis has a significant bearing on that of non-subject ellipses, as non-subjects are complementary to the subject within the argument structure of the sentence (§5.4, §6.3.2).

3.5.1 Conjunctive particles

Cross-linguistically, it is common for conjunctive particles to function as switch-reference markers (Stirling 1993:5). Fujii (1991) identifies the following particles from Japanese: -nagara, -te, -si, -tutu, -ø as SS markers, and -to, -tara, -ga, -node as DS markers. Myhill and Hibiya (1988) and Watanabe (1994) make the same claim about three particles: -te, -ø and -to, and Iwasaki (1993) about -te and -tara. The following two examples demonstrate that although the sentences (93a) and (93b) form a minimal pair, (93a) predicts a SS reading and (93b) a DS reading, and the difference in the interpretation derives from the conjunctive particles.

SS (93a) 入って来ながら、母が言った。
ø Haitte ki-nagara, haha-ga it-ta.
enter come-while, my mother-SB say-Past
‘My mother said (something), as (shei) came in.’

DS (93b) 入ってくると、母が言った。
ø Haitte kuru-to, haha-ga it-ta.
enter come-when, my mother-SB say-Past
‘When (someonei) came in, my mother j said (something).’

Those conjunctive particles thus offer a powerful means for determining the referential identity of ellipted subjects. As mentioned in §2.5.3.2, Minami (1974) also recognised, though from a different perspective, that some conjunctive particles can

21 Switch-reference properties found in Japanese are extensively discussed in Nariyama (1999). Watanabe (1994) also notes the strong statistical correlation between wa/ga and SS/DS interpretation in her analysis.

22 Akiba (1977) examined the classical Japanese text 'Taketori monogatar' written in the ninth century, and identified some Japanese particles functioning as switch-reference markers.
predict the coreferentiality of two subjects. As a result, various studies in the area of natural language processing, including Nakaiwa et al. (1995, inter alia), have utilised the conjunctive particles as a means of predicting a SS/DS distinction.

Although conjunctive particles are commonly regarded as switch-reference markers cross-linguistically, the analysis of the above conjunctive particles in Japanese may be called into question in two respects. Firstly, although switch-reference is a prototypically syntactic mechanism (see Wilkins 1988, Stirling 1993), it seems that the switch-reference reading from those conjunctive particles is fundamentally derived from the semantics of the conjunctive particles; simultaneous action is associated with SS, while sequential action with DS (Haiman and Munro 1983:xiv; Stirling 1993:40; Watanabe 1994:160-173). In (93a), the semantics of the particle -nagara requires that two actions be done simultaneously by the same subject, which leads to the SS reading. On the other hand, the semantics of the particle -to in (93b) requires that two actions be done sequentially by the different subject, which leads to the DS reading.

I found one pair of Japanese conjunctive particles whose switch-reference function does not simply derive from their semantics. These are purposive conjunctive particles. It is not uncommon in canonical switch-reference languages to find switch-reference markers in purposive clauses (Austin 1981). Observe the following minimal pair with distinct SS and DS purposive connectives. Note also that (94b) gets a DS reading, despite the general tendency of SS reading derived from sentences with two ellipted subjects (see §3.5.2, Fujii 1991):

SS  (94a) 勉強するために、本を買ってきた。
\(\text{øi} \text{Benkyoosuru tameni, \ øi hon-o katteki-ta.} \)
study Purp [SS] book-OB buy-Past
\'In order (for \(\text{øi}\)) to study, \(\text{øi}\) bought a book."
\(--\rightarrow \text{øi} \text{bought a book to study.}'

DS  (94b) 勉強するように、本を買ってきた。
\(\text{øj Benkyoosuru vooni, \ øi hon-o katteki-ta.} \)
study Purp [DS] book-OB buy-Past
\'In order (for \(\text{øj}\)) to study, \(\text{øi}\) bought a book."
\(--\rightarrow \text{øi} \text{bought a book for } \text{øj} \text{ to study.}'
These purposive connectives seem more canonical than other Japanese conjunctive particles discussed in the literature, in that switch-reference is basically syntactic, and their switch-reference function works on the basis of syntactic subject, but not of semantic agent. The following pair of sentences demonstrates that although the logical content of the matrix clause in (95a) is identical with that in (95b), in that both mean '(someone) takes medicine and goes to bed in order to get better', their subordinate clauses are different. (95a) has a transitive clause with an elided subject coreferential with the matrix subject, i.e. SS sentence, while (95b) has an intransitive clause with 'sickness' as the subject, i.e. DS sentence. This difference is reflected in the type of purposive markers used in each sentence.

SS (95a) 病気を早く治すために、薬を飲んで寝る。
ø Byooki-o hayaku naosu tameni, ø kusuri-o non-de neru.
sick-OB quickly fix[Vt] Purp[SS] medicine-OB drink-and sleep
'In order (for ø i) to heal from sickness, (øi) takes medicine and goes to bed.'

DS (95b) 病気が早く治るように、薬を飲んで寝る。
Byooki-ga hayaku naoru yooni, ø kusuri-o non-de neru.
sick-SB quickly fix[Vi] Purp[DS] medicine-OB drink-and sleep
'For sickness i to heal, (øj) takes medicine and goes to bed.'

Secondly, the reason why the above conjunctive particles in Japanese, including the purposive connectives, may be called into question is that the conjunctive particles in Japanese seem to only indicate preference, but they do not provide the strict determination of the SS/DS distinction. As Myhill and Hibiya, Fujii, Iwasaki, and Watanabe point out, the conjunctive particles which they analyse as switch-reference markers, function as switch-reference systems only around 60 to 90 percent of the time in their corpora (Myhill and Hibiya 1988, Fujii 1991:145-7, Iwasaki 1993:64, Watanabe 1994:150-2). Also, as discussed in §2.5.3.2, Minami (1974:130) indicates that it is not his intention to suggest that his study of conjunctive particles predicts the SS/DS distinction, although there is a strong correlation.

Iwasaki (1993:61-77) provides explanations for the overriding cases of readings derived from the conjunctive particles, using what he calls "speaker’s perspective". The Japanese switch-reference system is more sensitive to speaker’s perspective and information accessibility than to strict subjeethood, so that if there is
a perspective shift within a complex sentence, for example, represented by tense, voice, polarity, expectancy of the situation, and volitionality of the verb, then it allows a DS particle to be used even when the sentence has a SS reading. Iwasaki (1993:68) gives the following example where the use of the DS marker -tara in SS sentences conveys the unexpectedness of the event described in the matrix clause:

\[ DS \rightarrow SS \]

\[ \text{学校に行ったら、勉強させられた。} \]

_\[ \text{school to go-when, study-Caus-Pass-Past} \_\]

'When (I) went to school, (I) was forced to study.'

Thus, the conjunctive particles in Japanese provide a good indication of the SS/DS distinction, but the interpretation derived from them is susceptible to other means which also provide the interpretation of sentences. The next subsection provides one of the factors responsible for the phenomena by showing in detail how the switch-reference reading derived from the conjunctive particles can be overridden by the SS/DS readings derived from the interaction of _wa_ and _ga_. In §3.6 and Chapter 7, I present how best we can utilise the DS/SS reading derived from the conjunctive particles in accurately interpreting the referential identity of ellipted subjects.

### 3.5.2 _Wa_ and _ga_

In Nariyama (1999), I extensively discussed how the interaction of the nominative case marker _ga_ and the topic maker _wa_ in complex sentences exhibits an analogous property to switch-reference systems, in that the SS/DS distinction brought about by the interaction of _wa_ and _ga_ has a significant and consistent bearing on the identity of ellipted subjects. Commonly observed sentences, such as the following, are brought together to form a semi-minimal pair of sentences to demonstrate this point:

\[ SS \]

\[ \text{花子は入ってくるなり、戸を閉めた。} \]

_\[ \text{Hanako-wa haitte kuru nari, to-o shime-ta.} \_\]

Hanako-Top enter come as soon as, door-OB shut-Past

'As soon as Hanako entered, (she) shut the door.'

\[ DS \]

\[ \text{花子が入ってくるなり、戸を閉めた。} \]

'When (I) went to school, (I) was forced to study.'
Hanako-\textit{ga} haitte kuru \textit{nari}, to-o shime-ta.

‘As soon as Hanako came in, (someone else) shut the door.’

The interpretation of these sentences incontrovertibly requires a SS reading in (97a) and a DS reading in (97b).

Due to the functional complexity of switch-reference systems and the limited space in this thesis, I can only present the phenomena which are of direct relevance to this thesis, but more detailed explanation and substantiation are found in Nariyama (1999).

3.5.2.1 Correlation between \textit{wa/ga} and DS/SS distinction

In order to investigate why (97a) has a SS reading and (97b) a DS reading, I examine the types of sentence structure where the interaction of \textit{wa} and \textit{ga} determines the identity of ellipted subject. Two syntactic constraints are pertinent here. Firstly, Japanese syntax requires that the main clause follows the subordinate clause, as is typical for both OV languages (Comrie 1983:20) and switch-reference languages (Stirling 1993:23). Unlike in English, this clause order cannot be reversed. Secondly, a subordinate subject must be marked by \textit{ga}, whereas a matrix subject is marked either by \textit{wa} or \textit{ga} (Shibatani 1990:263). A complex sentence can contain more than two clauses. However, switch-reference behaves in a binary way, in that one clause is dependent/subordinate to another, which may be also subordinate to another (Austin 1981:329, Haiman and Munro 1983:xiii, Stirling 1993:6). For simplicity, I first examine complex sentences with two clauses, and subsequently, I explain those complex sentences with more than two clauses. The underlying structure of complex sentences following these syntactic constraints under this framework is formulated below:

[X-\textit{ga} subordinate clause ] , Y-\textit{wa/ga} main clause

23 Strictly speaking, \textit{wa} can be used in subordinate clauses in three types of constructions: a contrastive sentence, a quoting clause, and a sentence where a subordinate clause is semantically independent from its main clause (see Nariyama 1999 for examples). This issue is discussed in §3.5.3.1 under ‘Clause-linkage’.
In the examples to follow, the subordinate clause is indicated by [ ], and the subordinate subject is represented by X and the matrix subject by Y. Following this framework, there are six types of structures possible:

<table>
<thead>
<tr>
<th>Structure number</th>
<th>Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firstly,</td>
<td>[ ø ... ,] Y-wa ... .</td>
</tr>
<tr>
<td>Secondly,</td>
<td>Y-wa [ ø ... ,] ... .</td>
</tr>
<tr>
<td>Thirdly,</td>
<td>[X-ga ... ,] ø ... .</td>
</tr>
<tr>
<td>Fourthly,</td>
<td>[ ø ... ,] Y-ga ... .</td>
</tr>
<tr>
<td>Fifthly,</td>
<td>[ ø ... ,] ø ... .</td>
</tr>
<tr>
<td>Sixthly,</td>
<td>[ X-ga ... ,] Y-ga/wa ... .</td>
</tr>
</tbody>
</table>

Note that Structure (i) has a variant Structure (ii) which is treated as a distinct pattern, since it frequently appears in texts as well as for other reasons explained later. Structure (vi), which involves no ellipsis, is not a concern for this thesis, but is included in the analysis to be complete. Analogously, the preposed structures Y-ga [ X-ga ... ,] ... . and [ X-wa ... ,] Y-wa ... . occasionally occur, and will be considered in the corpus analysis in §3.5.2.2, but are not discussed in this subsection, because they involve no subject ellipsis.

In this subsection, I discuss each of structures (i) to (v) in order, using constructed sentences, and develop a summary of the correlation of structural type with interpretation. Then in the next subsection (§3.5.2.2), I test this against the textual corpus.

In order to show that SS/DS readings are not dependent on certain structures of sentences, for each structure above I examine three structurally different sentences:
(a) adverbial clauses, (b) relative clauses, and (c) complement clauses.

Firstly, Structure (i) [ ø ... ,] Y-wa ... . Observe the following examples:

SS (98a) 入って来るなり、花子は戸を閉めた。
[ ø Haitte kuru nari,] Hanako-wa to-o shime-ta.
SB enter come as soon as, Hanako Top door-OB shut-Past
‘As soon as (she) came in, Hanako shut the door.’

SS (98b) 以前借りていた家を花子は買った。
[ø Izen karitei-ta] ie-o Hanako-wa kat-ta.
SB previously rent-Past house-OB Hanako Top buy-Past
‘Hanako bought the house which (she) had rented before.’
Chapter 3

SS  (98c) 合格すると花子は考えている。

\>[\text{Hanako-v wa gookakusuru to}] \text{Hanako-Top think} \text{ ‘Hanako\text{\text{\text{-}v}} thinks that (she\text{\text{\text{-}j}}) will pass (the exam.)’}

All of the above examples incontrovertibly have same-subject interpretations. Thus, we conclude that Structure (i) signals a SS reading.

Secondly, Structure (ii) \text{Y-wa \[\text{\text{-j} \ldots ,]} \ldots \text{\text{-j},} \text{which is an alternative variant of Structure (i), in which ‘Y-wa’ is preposed to the front of the sentence, and the subordinate clause is sandwiched between the matrix subject and the matrix predicate. This preposed Structure (ii) gives SS readings exactly like S(i), as shown below:}

SS  (99a) 花子は入って来るなり、戸を閉めた。

\>[\text{Hanako-v wa \[\text{\text{-j} haitte kuru nari,}\] to-o shime-ta.} \text{Hanako-Top SB enter come as soon as, door-OB shut-Past ‘As soon as Hanako\text{\text{-}v} came in, (she\text{\text{\text{-}j}}) shut the door.’}

SS  (99b) 花子は以前借りていた家を買った。

\>[\text{Hanako-v wa \[\text{\text{-j} izen karitei-ta}\] ie-o kat-ta.} \text{Hanako-Top SB previously rent-Past house-OB buy-Past ‘Hanako\text{\text{-}v} bought the house which (she\text{\text{\text{-}j}}) had rented before.’}

SS  (99c) 花子は合格すると考えている。

\>[\text{Hanako-v wa \[\text{\text{-j} gookakusuru}\] to kangaeteiru.} \text{Hanako-Top SB pass (the exam.) Comp think ‘Hanako\text{\text{-}v} thinks that (she\text{\text{\text{-}j}}) will pass (the exam.)’}

Thirdly, Structure (iii) \[\text{X-ga \ldots ,} \text{\text{-j} \ldots \text{\text{-j}, The relevant examples are:}

DS  (100a) 花子が入って来るなり、戸を閉めた。

\>[\text{Hanako-ga haitte kuru nari,} \text{\text{-j} to-o shime-ta.} \text{Hanako-SB enter come as soon as, door-OB shut-Past ‘As soon as Hanako\text{\text{-}g} came in, (someone else\text{\text{\text{-}j}) shut the door.’}

DS  (100b) 花子が以前借りていた家を買った。

\>[\text{Hanako-ga izen karitei-ta} \text{\text{-j} ie-o \text{\text{-j} kat-ta.} \text{Hanako-SB previously rent-Past house-OB SB buy-Past ‘(Someone\text{\text{\text{-}j}) bought the house which Hanako\text{\text{-}g} had rented before.’}

DS  (100c) 花子が合格すると考えている。

\>[\text{Hanako-ga gookakusuru to \text{\text{-j} kangaeteiru.} \text{Hanako-SB pass (the exam.) Comp SB think ‘(Someone\text{\text{\text{-}j}) thinks that Hanako\text{\text{-}g} will pass (the exam.)’}

As these examples make clear, Structure (iii) signals a DS reading.
Fourthly, we pass to Structure (iv) \[ \theta \ldots, ] Y-ga \ldots . \] The relevant examples are:

**DS/SS**  (101a) 入って来るなり、花子が戸を閉めた。
\[ \theta \ haitte \ kuru \ nari., \] Hanako-ga to-o shime-ta.
SB enter come as soon as, Hanako-SB door-OB shut-Past
‘As soon as (shei/j) came in, Hanako\(_i\) shut the door.’

**DS/SS**  (101b) 以前借りていた家を花子が買った。
\[ \theta \ izen \ karitei-ta \ ie-o \ Hanako-ga \ kat-ta. \]
SB previously rent-Past house-OB Hanako-SB buy-Past
‘Hanako\(_i\) bought the house which (shei/j) had rented before.’

**DS/SS**  (101c) 合格すると花子が考えている。
\[ \theta \ gookakusuru \ to \ Hanako-ga \ kangaeteiru. \]
SB pass (the exam.) Comp Hanako-SB think
‘Hanako\(_i\) thinks that (shei/j) will pass (the exam.)’

All the examples in this case can have either SS reading or DS, depending on the context. Hence, Structure (iv) does not determine a value in the SS/DS dimension.

This finding agrees with the general tendency of switch-reference languages that switch-reference is marked on the subordinate (dependent) clause but not on the main clause (Comrie 1983:23; Haiman and Munro 1983:xii; Stirling 1993:6). Although in Structures (i) and (ii) switch-reference seems to be marked on the matrix clause by \( wa \), in essence it is the presence or absence of a \( ga \)-marked subject in the subordinate clause that possesses the property of switch-reference, and the SS reading from the \( wa \)-marked subject follows from the fact that it is complementary to the \( ga \)-marked subject.

Fifthly, Structure (v) \[ \theta \ldots, \] \( \theta \ldots . \)

When both subjects are ellipted, they are more likely to be coreferential (Fujii 1991, Nariyama 1999), as shown below:

**SS**  (102a) 入って来るなり、戸を閉めた。
\[ \theta_i \ haitte \ kuru \ nari., \] \( \theta_i \) to-o shime-ta.
SB enter come as soon as, SB door-OB shut-Past
‘As soon as (someone\(_i\)) came in, (someone\(_i\)) shut the door.’

**SS**  (102b) 以前借りていた家を買った。
\[ \theta_i \ izen \ karitei-ta \ ie-o \ \theta_i \ kat-ta. \]
SB previously rent-Past house-OB SB buy-Past
‘(Someone\(_i\)) bought the house which (someone\(_i\)) had rented before.’

**SS**  (102c) 合格すると考えている。
[øi Goukakusuru] to øi kangae teiru.
SB pass (the exam.) Comp SB think
'(Someoneœ) thinks that (someoneœ) will pass (the exam.)'

However, a DS reading in Structure (v) occurs occasionally, when the context, verbal semantics, or world knowledge imply otherwise, as shown in (103):

DS (103) 過っても許さない。
øi Ayamat-temo, øj yurusa nai.
apologise even forgive Neg
'Even if øi apologised, øj won't forgive (øi).'

This DS reading is due to the semantic content of the verbs, in that the acts of 'apology' and 'forgiveness' about the same matter cannot normally be conducted by the same referent. It makes much more sense to interpret the acts of those two semantically opposing verbs as conducted by different subjects. SS is possible in this case, but it requires a lot of contextual information, for example, 'Even if I apologised verbally, it doesn't mean I have forgiven him.' On the other hand, the DS reading is immediately reached. Thus, Structure (vi) is more likely to signal a SS reading than a DS reading, i.e. SS>DS.

Sixthly, Structure (vi) [ X-ga ... ,] Y-ga/wa ... .

All of the examples below show that this structure has a DS implication; no matter what referent the subject of the matrix clause is, the sentences cannot have a SS reading. A repeat of Hanako, or the use of a personal pronoun kanojo sounds odd, and cannot signal the SS reading, instead, if anything, they would be interpreted as different referents. On the other hand, a different subject, such as Taro, is natural and acceptable. Thus, overt subjects in complex sentences signal a DS reading.

DS (104a) 花子が入ってくるなり、花子/彼女/太郎 が/は戸を閉めた。
[Hanako-ga i-ga  haitte  kuru  nari,]
Hanako-SB enter come as soon as,
?Hanako/kanojoj/Taroj -ga/wa to-o shime-ta.
Hanako/she/Taro door-OB shut-Past
'As soon as Hanako came in, Hanako/kanojoj/Taroj shut the door.'

DS (104b) 花子が以前借りていた家を花子/彼女/太郎 が/は買った。
Hanako-SB previously rent-Past house-OB buy-Past
'(Hanakoj/kanojoj/Taroj) bought the house which Hanakoj had rented before.'
The following table summarises the correlation of structures involving "wa/ga, and values in the DS/SS dimension. Note that these correlations are provisional, and the next subsection presents a revised version, after examining the corpus.

**Table 13.1: Correlation of structure of "wa/ga and DS/SS (provisional)**

| S(i) | [øi ... ,] Yi-wa ... . -> SS |
| S(ii) | Yi-wa [øi ... ,] ... . -> SS |
| S(iii) | [X-ga ... ,] òj ... . -> DS |
| S(iv) | [øi/j ... ,] Yi-ga ... . -> SS/DS |
| S(v) | [ø ... ,] ø ... . -> SS>DS |
| S(vi) | [X-ga ... ,] Y-ga/wa ... . ->DS |

### 3.5.2.2 Statistical correlation

The SS/DS readings derived from the interaction of "wa and "ga are statistically confirmed in written narrative texts (PHP monthly magazines). 197 complex sentences comprising two clauses were examined. Complex sentences with more than two clauses can show different behaviour with respect to "wa and "ga, so are discussed in the next subsection. The results are shown in Table 14 below. The 197 complex sentences are grouped according to the number of overt subjects; sentences with two-overt subject are shown in the table 14.1, sentences with one-overt subject are shown in the table 14.2, and sentences with no-overt subject are shown in the table 14.3, and the total for the three subtables is shown in Table 14.4. The sentences are further sorted according to the type of markers, i.e. "wa or "ga, and the location of these markers in relation to ellipsis. Each sentence type is indicated with the corresponding structure type, as well as being numbered from 1 to 6 on the left in the tables. Apart from the structures (i) to (vi), there are also sentences in the corpus with both subjects marked by "wa (indicated by '0': contrastive usage) or "ga (indicated by '2.1' and '2.2'). Although these sentences with overt subjects are not an issue for this thesis, they are included in the table to be comprehensive and to show that overt...
subjects signal a different subject. Where a preposed subject is applicable, this variant construction is noted by 'x.2'. The asterisked figures in Table 14.2 will be given explanations in the subsequent sections.

Table 14: Distribution and ratios of complex sentences by wa, ga, and ellipsis

Table 14.1: Two-overt subject sentences

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>DS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 S(vi)</td>
<td>[ga ...] wa ...</td>
<td>0</td>
<td>17 (8.6%)</td>
</tr>
<tr>
<td>1.2 S(vi)</td>
<td>wa [ga ...] ...</td>
<td>0</td>
<td>4 (2.0%)</td>
</tr>
<tr>
<td>2.1 S(vi)</td>
<td>[ga ...] ga ...</td>
<td>0</td>
<td>9 (4.6%)</td>
</tr>
<tr>
<td>2.2 S(vi)</td>
<td>ga [ga ...] ...</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>[wa ...] wa ...</td>
<td>0</td>
<td>2 (1.0%)</td>
</tr>
</tbody>
</table>

Total for 2-overt subject sentences: 32 (16.2%)

Table 14.2: One-overt subject sentences

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 S(i)</td>
<td>[ø ...] wa ...</td>
<td>10 (5.1%)</td>
<td>0</td>
</tr>
<tr>
<td>3.2 S(ii)</td>
<td>wa [ø ...] ...</td>
<td>68* (34.5%)</td>
<td>0</td>
</tr>
<tr>
<td>4. S(iii)</td>
<td>[ga ...] ø ...</td>
<td>2* (1.0%)</td>
<td>20 (10.2%)</td>
</tr>
<tr>
<td>5. S(iv)</td>
<td>[ø ...] ga ...</td>
<td>0*</td>
<td>13* (6.6%)</td>
</tr>
</tbody>
</table>

Total for 1-overt subject sentences: 113 (57.4%)

Table 14.3: No-overt subject sentences

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6. S(v)</td>
<td>[ø ...] ø ...</td>
<td>47 (23.9%)</td>
<td>5 (2.5%)</td>
</tr>
</tbody>
</table>

Total for 0-overt subject sentences: 52 (26.4%)

Table 14.4: Total for complex sentences with two clauses

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>127 (64.5%)</td>
<td>70 (35.5%)</td>
<td>197 (100.0%)</td>
</tr>
</tbody>
</table>

Although the number of complex sentences in the analysis is relatively small, the results are in strong agreement with the claims made in the last subsection. First of all, Table 14 (i.e. merging all the subtables) shows that 83.8% of complex sentences (i.e. Table 14.2 plus Table 14.3) have one or both subjects elided whose referents need to be identified. Of these, more than half (57.4%) of the complex sentences fall into the category of sentences with one-overt subject and one-ellipted subject (i.e. Table 14.2). This is where the switch-reference property of wa and ga
comes into play for referent identification. Table 14 confirms that when both subjects are overt, the sentence has a DS reading (i.e. Table 14.1); when one of the subjects is overt, the sentence can have either a DS or SS reading (i.e. Table 14.2); and when both subjects are ellipted, the sentence is most likely to have a SS reading (23.9%), but it can have a DS reading to a much lesser extent (2.5%) (i.e. Table 14.3).

Table 14.2 shows that the proposed switch-reference readings of S(i), S(ii), and S(iii) are basically correct, but the asterisked figures "*ii" and "*iii" in Table 14.2 show different results from what were predicted in Table 13.1, and these are examined in the following sections. Although S(iv) in Table 13.1 was found to denote either SS or DS, S(iv) under the asterisked figure "*iii" in Table 14.2 found no cases of predicting SS. This means that only the asterisked figure "*ii" is the case which is incorrect in terms of Table 13.1, and this is only two out of 113 sentences.

In other words, the switch-reference property of the wa/ga distinction can identify the coreferentiality of two referents in complex sentences by itself with a high accuracy rate of 98.2% (111/113). This accuracy rate is further improved once it is combined with information from the other linguistic devices discussed in the rest of Chapter 3 and Chapters 4, 5 and 6.

Preposed structures involving wa are found to be common, particularly in S(ii), i.e ‘wa [ø ...] ... ’ indicated by ‘*i’ in Table 14.2. In fact, this preposed structure is the most commonly used structure among all the structures in the tables (34.5%). The next commonest structure is S(v) with no-overt subject sentences giving SS reading which occurs at the rate of 23.9% (in Table 14.3).

### 3.5.3 Overriding elements affecting the SS/DS reading

Table 14.2 includes only one figure which does not agree with the claim made in Table 13.1. That is, S(iii) [ga ...] ø ..., indicated by "*ii" in the table, where two
sentences out of 22 have a SS reading, even though S(iii) is said to signal a DS reading. In other words, the rest (i.e. 91%) had the readings as predicted by Table 13.1. §3.5.3.1 examines the overriding elements which have caused this outcome. Related to this is the case of sentences with more than two clauses, and these are examined in §3.5.3.2.

The other anomaly is S(iv) [ø ... ] ga ... , indicated by ‘*iii’ in the table. Although S(iv) is said not to predict a SS/DS distinction in Table 13.1, Table 14.2 shows no instance of SS reading, with all examples having a DS reading. This is related to the existence of a discourse topic in the context, and this is explained in §3.5.3.3.

3.5.3.1 Clause-linkage

Table 13.1 stated that Structure (iii) predicts a DS reading. However, two sentences out of 22 with this structure in fact have a SS reading, indicated by ‘*2’ in Table 14.2. Although they comprise a mere 9% of the Structure (iii) sentences in the corpus, it is important to examine the cause of this variation. The actual sentences are presented below:

SS (105) 妻が、テレビを見ながら涙ぐんでいる。
Tsuma-ga, {terebi-o mi nagara namidagunde-iru}.
my wife-SB TV-OB watch while[SS] in tears-ing
My wife is crying while she watches TV.’
(PHP 12.1997)

SS (106) 一人が、私を見るなりこう言った。
Hitori-ga, {watashi-o miru nari koo it-ta}.
one person-SB 1sg-OB see as soon as this say-Past
‘One person said this, as soon as he saw me.’
(PHP 9.1997)

This violation of SS reading is due to clause-linkage, in that two predicates are treated as a single clause, so that essentially these sentences are not a complex sentence. In both sentences, a comma is placed after the ga-marked subjects, but no space nor comma is placed after the first predicate in the texts. The comma here represents a pause which signals the end of a meaningful unit. In both examples, this comma is not found after the first predicate, separating it from the second predicate. This
explicitly indicates that the two clauses are treated as a mono-clause. In (105), the comma or pause after the ga-marked subject is not essential to achieve a SS reading, presumably because the SS conjunctive particle nagara is reinforcing the SS reading. Thus, when Structure (iii) has a SS conjunctive particle, and/or no signal (e.g. comma/pause) between two predicates and possibly a signal after the ga-marked subject, the sentence signals a SS reading, namely:

\[
\text{SS: } \quad [X\text{-}ga \text{ (signal)...} \{ \text{SS particle / no signal}, \ \emptyset_x \ ... \}].
\]

3.5.3.2 Sentences with more than two clauses

When we consider sentences with more than two clauses (which are not included in Table 14), there are six further examples in the texts which seemingly violate Structure (iii) by signalling a SS reading instead of DS. This happens when the subject is marked by -ga instead of -wa, resulting in a structure that looks like S(iii) instead of S(i). There are two factors that contribute to this outcome, and the first factor is particular to sentences with more than two clauses.

One factor is that if a matrix clause is dominated by another matrix clause on a higher node in the sentence, it is also a subordinate clause in relation to the higher matrix clause. Hence, it must take ga marking instead of wa marking, following the syntactic constraint that subordinate subjects be marked by ga, even though wa would have been used to reach a SS reading if the sentence had consisted of two clauses. Observe one such example (clause numbers are indicated by subscripts):

(107) 父が癌を患いこの世を去った後、母が手入れをすることになった。

[[Chichi\text{-}ga [gan\text{-}o wazura\text{-}i]_1 kono yo\text{-}o satta ato]_2, my father\text{-}SB cancer\text{-}OB suffer\text{-}[SS] this world\text{-}OB left after 
  haha\text{-}ga teireosuru]_3 kotoni natta.]_4

my mother\text{-} take care Nomz became 

‘After my father suffered from cancer\text{1} and left this world\text{2}, 
the situation became such\text{4} that my mother had to take care of (it)\text{3}.’

(PHP 9.1997)

The relation between clause 1 and 2 is same subject and should fall under Structure (ii), wa [ø ... ] ... . However, the preposed subject of clause 2 chichi is marked by ga instead of wa. This is due to the fact that even though clause 2 is a matrix clause in
relation to clause 1, it is still a subordinate clause because it is dominated by a higher matrix clause in the sentence. Note, as mentioned earlier, that a subordinate clause always precedes its matrix clause in Japanese, as is the case for OV languages. This relation is best illustrated by the underlying structure using a phrase structure below (SC = subordinate clause, MC = matrix clause):

\[
S \\
SC \quad MC_4 \\
(\text{null subject}) \\
SC \quad MC_3 \\
(-\text{ga}) \\
SC_1 \quad MC_2 \\
(\emptyset \text{ subject}) \quad (\text{preposed -}ga) \\
\]

(107) [[Chichi-ga \[gan-o wazurai\] \[ø konoyo-o satta ato\]., haha-ga teire-o suru][3 kotoni natta.]

**Figure 13: Phrase structure for example (107)**

MC\(_2\) and MC\(_3\) may be matrix clauses in relation to their sister clauses, but they are subordinate clauses with respect to the whole sentence. Subjects can be marked by `wa` only if they are in the matrix clause on the highest node, and all the other subjects must be marked by `ga`. This is the only difference between sentences with two clauses and sentences with more than two clauses. This is what caused those sentences that seem to have Structure (iii) and to appear to violate the reading associated with Structure (iii). Apart from this, the basic principle is the same;

1) make overt expression of a subject in a subordinate clause whenever the subject is different from its matrix subject (i.e. DS of Structure (iii)),

2) if the subject in a subordinate clause is the same as its matrix subject, elide the subject in the subordinate clause and prepose the matrix subject (i.e. SS of Structure (ii)). Importantly, this matrix subject must be marked by `ga`, if it is not the highest matrix clause of the structure.
Thus, in applying this principle to (107), the subject in SC1 is the same as that in MC2, so that the subordinate subject is ellipted and the subject in MC2 is retained, and this subject is preposed to the front of SC1. This is compatible with S(ii). However, the subject in MC2 must be marked by *ga* instead of *wa*, because it is not the highest matrix clause, unless it is the same subject as the subject in the highest matrix clause. The preposed subject of MC2 (which is subordinate to MC3) is overt, because it is different from the subject in MC3. Similarly, MC3 is overtly marked by *ga*, because it is DS from its matrix clause in MC4, which has a mutative verb *-nar* ('to become') with an unspecifiable (agentless) subject.

Kuno (1978:116) made an analogous claim that when the matrix subject is the same as the subject in the subordinate clause, it is difficult to elide the matrix subject and leave the subject in the subordinate clause. This agrees with my claim. He goes on to say (op. cit) that it is uncertain, however, why some sentences, such as (108), are acceptable:

(108) 太郎が聞けば、手伝ってくれるだろう。

*I suggest that the acceptability of (108) is due to the fact that, as in (107), the *ga*-marked subject is the result of occurring in a subordinate clause. That is to say, (108) has the following structure, with *daroo* comprising another clause (matrix clause) with an ellipted subject. *Daroo* is epistemic and denotes the speaker's speculation about what will happen, as shown in the given translation:

(108a) [[Taro*-ga kik-eba, *oi tetsudat-te kur eru *daroo].

'I imagine [if Taro hears (it), he will help (me)].''

---

25 Stirling (1993) also considers the phenomenon of sentences with more than two clauses in canonical switch-reference languages. She states (ibid. 18–23) that the locality condition for switch-reference markings holds for sentences with two clauses, but it can be violated for sentences with more than two clauses. She describes the nature of violation in terms of interrelated notions: 'clause-skipping' and 'focus clause'. For the former, the SS or DS marking will not relate to its subject but to the subject of the next clause on the same grammatical level as the marked clause. For the latter, the SS or DS marking will relate to the focal main clause, which is usually the final clause in the sentence, and each subordinate clause is checked against its focal main clause rather than a neighbouring clause. The latter system is similar to what happens in Japanese with the additional factor of the preposed subject.
Chapter 3

The other factor which may violate the usual reading of Structure (iii) and signal a SS reading instead, has to do with topicalisation. Topic marking is not limited to the subject in Japanese. When a non-subject is topicalised and marked by wa, the subject does not generally take another topic marker wa within the same sentence, even when that will be necessary to extend its scope and have SS reading. One such example is shown below:

(109) この柿は母が買ってきて育てたものだった。

[Kono kaki-wa [haha-ga, katteki-te] o sodateta]_2 mono dat-ta._3

\[\text{this persimmon- my mother- bought and[SS] raised } \quad \text{Nomz Cop-Past}\]

‘This persimmon tree is what my mother bought and raised.’

(PHP 9.1997)

Even though (109) looks like having a structure wa [ga ...] ... . for the first two clauses, the wa-marked argument is not the subject but a topicalised object. The underlined ga-marking is the result of two factors: object topicalisation, and clauses 1 and 2 being subordinate clauses of a higher clause 3, both of which cause the SS to be marked by ga.

To sum up the two subsections, I have shown that there are two factors which override the correlation in Table 13.1. One is clause linkage. This occurs when the two clauses are essentially a mono-clause joined by a SS marker and/or have no signal (e.g. comma/pause) between the two predicates, namely:

\[\text{SS: } [X-ga \text{ (signal)}... \text{ SS particle / no signal}]_x \quad \text{... .}\]

The other factor has to do with sentences with more than two clauses, in relation to the syntactic constraint that the subject in subordinate clauses must be marked by ga. The matrix clause to its sister clause is also a subordinate clause in relation to the whole sentence, if it is dominated by another clause in a higher node. This results in the structure looking like S(iii) but giving a SS reading. The corpus analysis in §7.2 will show that such cases are more often accompanied by a SS marker than not, and hence do not cause trouble in retrieving referents of ellipted arguments.\(^{26}\)

\(^{26}\) This may sound contradictory to the statement in §2.5.3 and §3.5.1 that the interpretation derived from the conjunctive particles is susceptible to other means which also provide the interpretation of sentences, but it is not. When an analysis is set the interpretation derived from the conjunctive
3.5.3.3 Existence of discourse topic

There was one other discrepancy, though not overriding, between what is proposed in Table 13.1 and what the actual texts have shown in Table 14.2. Although we observed earlier that sentences under Structure (iv) can be either SS or DS, Table 14.2 shows no instance of S(iv) giving a SS reading, indicated by ‘*iii’, namely:

\[ S(\text{iv}) \quad [\emptyset \ldots \,] \, \text{Y-ga} \ldots \, \rightarrow \, \text{SS/DS} \]

The earlier observation was based on constructed sentences in isolation, whereas the results in Table 14.2 are based on sequences of sentences in the actual texts. This is a critical difference. That is to say, the existence of context, and the presence of a discourse topic in particular, has a strong effect on the ultimate interpretation for S(iv). If there was no discourse topic, the ellipted subject would tend to be interpreted as coreferential with the overt subject in the sentence, hence deriving a SS interpretation. This is how the earlier prediction was made. On the other hand, if a sentence has an established discourse topic which is distinct from the overt ga-marked subject, the ellipted subject is interpreted as coreferential with the discourse topic, leading to a DS interpretation, unless other elements, such as verbal semantics and world knowledge, indicate otherwise. This is exactly what happens in (110a) and (110b) under Structure (iv). Without context, the reading in (110a) inclines to SS.

SS>DS (110a) 病気なのに、花子が会社に行った。

\[ [\emptyset_i \, \text{Byooki na noni,}] \, \text{Hanako}_i \text{-ga} \, \text{kaisha-e} \, \text{it-ta}. \]

‘Although \(i\) was sick, Hanako\(i\) went to work.’

However, if there is a discourse topic which is distinct from the given matrix subject, the same sentence will only allow a DS reading, and the ellipted subject will be coreferential with the discourse topic, as shown in (110b):

DS (110b) 太郎は風邪をひいて、学校を休んでいる。

\[ \text{Taro}_j \text{-wa kazeohiite,} \, \emptyset_j \, \text{gakkoo yasundeiru}. \]

particles as the basic information, the interpretation can be overridden by other means. But I will show in §7.2, when an analysis bases the interpretation derived from other means, such as the wa/ga distinction, then the interpretation from the conjunctive particles can in fact reinforce that interpretation.
catch cold, school absent

[Taro has a cold and didn’t go to school. Although ōj was sick, Hanako went to work.]

Thus, it seems that the interpretation of S(iv) is SS if the sentence has no context and no prior mention of subject which can be the referent of the ellipted subject. However, Table 14.2 shows no instance of such SS readings. This means that ellipted subjects under this structure are coreferential with the discourse topic. S(iv) should thus be revised as the following, in the light of corpus data:

\[
S(iv) \ [ \ ø \ ... \ ] \ Y_{-}ga \ ... \ . \quad \rightarrow \quad DS > (SS)
\]

This analysis has shown that an ellipted subject is interpreted as coreferential with the discourse topic, which can be either the topic outside the sentence (i.e. DS under S(iii), S(iv), and S(v)) or the wa-marked subject within the sentence (i.e. SS, S(i) and S(ii)). This idea goes along with the claim that a topic referent is generally expressed by ellipsis after the first mention (§2.5, see Kameyama 1985 for Centering Theory, Hinds 1983). The reading derived from the wa/ga distinction, therefore, goes beyond intrasentential ellipsis appearing in complex sentences, and extends to intersentential ellipsis. This is discussed in §6.1, in the chapter dealing with intersentential ellipsis.

3.5.4 Summary of switch-reference properties

To summarise §3.5, Table 13.2 is presented as a revision showing the correlation between structures involving wa and ga and a SS/DS prediction:

Table 13.2: Correlation of structure of wa/ga and DS/SS (revised)

<table>
<thead>
<tr>
<th>Structure</th>
<th>Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>S(i) \ [ òi ... ,] Y_{i}wa ... .</td>
<td>SS</td>
</tr>
<tr>
<td>S(ii) Y_{i}wa \ [ òi ... ,] ... .</td>
<td>SS</td>
</tr>
<tr>
<td>S(iii) \ [Xi-ga ... ,] \ øj ... .</td>
<td>DS &gt; (SS)</td>
</tr>
<tr>
<td>S(iv) \ [ òi ... ,] Y_{j}ga ... .</td>
<td>DS &gt; (SS)</td>
</tr>
<tr>
<td>[ ø ... ,] \ ø ... .</td>
<td>SS &gt; DS</td>
</tr>
<tr>
<td>S(vi) \ [ X-ga ... ,] Y_{-}ga/wa ... .</td>
<td>DS</td>
</tr>
</tbody>
</table>
Chapter 3

The corpus analysis has shown in Table 14.2 that the switch-reference property of the *wa/ga* distinction can identify the coreferentiality of two referents in complex sentences by itself with a high accuracy rate of 98.2% (111/113). The remaining was the result of two cases of overriding elements attributed to S(iii). This problem was solved by incorporating the following. The underlined clauses below show S(iii) on the surface which normally predicts DS readings, but they have SS readings. One is triggered by the SS conjunctive particle and/or no signal (e.g. comma/pause) between the two clauses. The other occurs in a sentence with more than two clauses, when both clauses are subordinate.

\[
\text{SS: } \text{S(iii) } \{ \text{X-} \text{ga (signal) } \{ \ldots \text{SS particle / no signal], } \_x \ldots \} \\
\text{SS: } \text{S(iii) } \{ \text{X-ga } \ldots \text{SS particle}, \_x \ldots \} \text{ Z-wa } \ldots \\
\text{(matrix subject)}
\]

Chapter 6 will investigate further this observation on switch-reference readings and discuss how the *wa/ga* distinction affects readings in discourse.

3.6 Summary of argument inferring morphemes

This chapter has presented a number of devices that function as argument inferring morphemes. §3.1 discussed verbal semantics, in particular, the way in which transitive-intransitive distinctions are morphologically recognisable and how the valency information derived from verbal semantics is vital in detecting the existence of ellipsis and determining the identity of the ellipsis. §3.2 discussed how benefactive and directional verbs are used to signal a direction of alignment (i.e. direct or inverse) which provides information about the relationship between the arguments in the sentence in terms of person/animacy hierarchy. It also demonstrated the importance of the notion of in-group and out-group, which has a bearing on the determination of person and the type of honorific markings. §3.3 discussed honorifics marked on verbal predicates which signal the referential identity of arguments in terms of social hierarchy. Honorific markings are also placed on nouns and signal the identity of genitive referents, which are often associated with subjects. §3.4 discussed epistemic morphemes in different forms, which make the distinction of first person vs
Chapter 3

non-first person. §3.5 discussed switch-reference properties in complex sentences in terms of conjunctive particles and wa/ga in making a SS/DS prediction.

Inverse alignment also has a significant relevance to the sentence devices discussed in Chapters 4 and 5. Since inverse alignment has more relevance to the sentence devices, it is handled under the sentence devices. This leaves us with four types of predicate devices for referent identification: verbal semantics, honorifics, epistemic morphemes, and switch-reference.

3.7 Interaction among predicate devices

In this section, I tackle a final question regarding predicate devices. Some sentences contain more than one type of the four predicate devices. Since each of these signals the referential identity of ellipsis, we need to consider the question of whether or not a discrepancy of interpretation may arise among the different types of the predicate devices.

First, observe (111), a set of sentences, each of which literally means 'Someone writes a book', but employs a distinct type of the predicate devices to signal that a particular subject is referent.

(111a) Without any predicate devices: neutral

本を書く。
\[ \emptyset \text{ Hon-o } kaku \]
SB book-OB write
'(I/Someone) writes a book.'

(111b) Epistemic morpheme: first person (singular or plural)

本を書こう。
\[ \emptyset \text{ Hon-o } kak-oo. \]
book-OB write-Voli
'*Someone / I am going to) write a book.'

(111c) Epistemic morpheme: non-first person

本を書くようだ。
\[ \emptyset \text{ Hon-o } kaku-yooda. \]
book-OB write-appear
'(Someone/*I) looks like going to write a book.'

(111d) Honorification: subject honorific (non-first person)

本をお書きになる。
\[ \emptyset \text{ Hon-o } o-kaki-ninaru. \]
(Honouree/*I) writes a book.'

*Kaku* 'to write' in (111a) is a basic form which makes no particular reference to a type of subject. In (111b), on the other hand, the verb stem *kak* is suffixed by a volitional morpheme giving *kak-oo* which signals that the referent is first person. In (111c), *yooda* 'appears' is suffixed to the verb stem. This gives a non-private verb showing lack of direct evidence for an intended action, and hence signifies that the referent is non-first person. In (111d), *o-kaki-ninaru* has subject honorific marking indicating that the subject referent is shown respect, hence it is not first person.

When a sentence contains more than one type of the predicate devices, generally, each type provides more cues towards the same interpretation, and hence they reinforce one interpretation, as shown in (111e):

(111e) Epistemic morpheme (non-first person) and subject honorific (non-first person)

\[ \text{本をお書きになるようだ。} \]
\[ \text{o Hon-o o-kaki-ninaru - yooda.} \]

'(Honouree/*I) looks like going to write a book.'

In (111e), *o-kaki-ninaru yooda* has subject honorific marking and also a non-private morpheme, both of which make the referent non-first person. Therefore, both morphemes reinforce the same interpretation, and do not conflict.\(^{27}\) Hence, each morpheme with a different type of the predicate devices adds information about the same referent which helps to further narrow down the referent for ellipsis. On the other hand, a combination of the predicate devices which leads to discrepancy is generally not possible, because such combinations generate a sentence which cannot make sense of, as shown in (111f).

(111f) Epistemic morphemes: non-first person and first person

\[ \text{* 本を書こうようだ。} \]
\[ \text{* o Hon-o kak-oo yooda.} \]

---

\(^{27}\) In terms of referent identification, it seems a little redundant to have both morphemes in (111e), in that a respected referent is never first person and *yooda* cannot refer to first person. However, each morpheme has other functions than simply signalling referent identification. For example, non-first persons are not all respected, so the combined use is not redundant but helps to further narrow down the identity of the ellipted subject from possible referents.
write-Voli appear
'(lit.) *(Someone) i appears that (I) i am going to write a book.'

Generally, override situations do not seem to arise from conflicts between the predicate devices. It is nearly impossible to negate the reading from verbal semantics, unless the speaker made an error in selecting the actual verb. This is as true of switch-reference devices, except that within switch-reference devices there are some overriding situations: such as discussed in §3.5.1, the readings between conjunctive particles and the wa/ga distinction.

However, conflicts arise between argument inferring morphemes on the predicate, when some private verbs are involved, for example:

(112a) ø Komaru.
SB troubled
'(I am) troubled.'

(112b) ø Komat-teiru.
SB troubled-Impf
'(Someone is / I am) troubled.'

(112c) ø Komat-teiru yooda.
SB troubled-Impf seem
'(Someone/*I) appears to be troubled.'

(112d) ø O-komarida
SB troubled[Hon]
'(Honouree/*I) is troubled.'

(112e) ø O-komarino yooda.
SB troubled[Hon] seem
'(Honouree/*I) appears to be troubled.'

Komaru 'be troubled' in (112a) is a private verb which makes the referent first person. When, however, the imperfective suffix teiru, denoting temporary state, is added to the private verb as in (112b), the subject can be either non-first person or first person. When a non-private morpheme yooda is further added to (112b), as in (112c), the referent is now interpreted as non-first person, i.e. the first person reading derived from the private verb is overridden by another epistemic morpheme. Similarly, ø-komarida in (112d) has honorific marking which marks the referent as respected, hence not first person. O-komarino yooda in (112e) has both honorific marking and a non-private morpheme, which makes the referent a respected non-first person. That is
to say, the first person reading derived from the private verb is overridden by the reading from another epistemic morpheme in (112c), the honorifics in (112d), or both in (112e), which are suffixed to the private verb.

Thus, generally, each type of the predicate devices provides more cues towards the same interpretation, and reinforces one interpretation. Hence, no hierarchy exists among the four types of the predicate devices in a strict sense, though detailed investigations are required to clarify this point to account for infrequent divergent cases. However, readings from some private verbs are susceptible to readings brought by other epistemic morphemes and honorific codings which are suffixed to the private verbs. To the limitations already discussed in §3.4.5, we must add the findings that readings from epistemic morphemes can be modulated in past tense, subordinate clauses and with empathy phenomena. This aspect is incorporated in the make up of the algorithm introduced in §7.1.
Chapter 4  Sentence devices I:
Principles of Direct Alignment

The type of devices for referent identification discussed in the last chapter centre around argument inferring morphemes, most of which are found on verbal predicates, hence they are called 'Predicate devices'. In this chapter, I present 'Sentence devices'. I demonstrate that the argument structure of Japanese sentences is constrained, and falls into certain structures according to the relationship between the arguments in the sentence. This relationship, manifested in the argument structure, in turn provides information about the referential identity of arguments. Such information is vital for referent identification when arguments are ellipted.

4.1  Argument structure

The issue of how person/animacy values affect argument structure has attracted little attention in the description of Japanese grammar, except for one aspect, which is stated in a number of works (Kuno 1973:31, Kindaichi 1981:209-211, Morita 1985:218, Tsunoda 1991, Fujii 1991, Mizutani 1995, inter alia). That is - by and large inanimate arguments cannot be the subject of a transitive sentence in Japanese, although they sometimes occur in translated texts and highly expository texts expressing abstract concepts.¹ For example, although the following English sentence is common and grammatical in English, its direct translation sounds extremely peculiar and would not be uttered by native speakers of Japanese:

(1) 'A cup of coffee will refresh you.'
コーヒーがあなたをさわやかにする。

?? Kooii-ga anata-o sawayakanisuru.
coffee-SB you-OB refresh

Apart from identifying this issue, little discussion or theoretical explanation has been given about the constraints imposed on argument structure in Japanese by the position

¹ An analogous phenomenon is documented about Chamorro (an Austronesian language of the Marianna) in Aissen (1997:736) that an inanimate argument cannot function as the subject in an active transitive clause, if the object is third person animate.
Chapter 4

of the arguments on the animacy hierarchy. Consequently, its importance has hardly been recognised and exploited in the description of Japanese grammar. This chapter is devoted to providing a description of argument structure in Japanese and to capturing the mechanisms involved in argument structure, which in turn will be a key to understanding the mechanisms of ellipsis discussed in Chapter 5.

Before entering into the description of argument structure, three key terms used in this thesis must be clarified: 'argument', 'alignment', and 'argument structure'.

'Argument' refers to a NP subcategorised by a verb, bearing a specific grammatical relation to the verb; it may be core or oblique (such as source or goal, see §3.2.2 ). For the purpose of this thesis, it is important to consider these oblique NPs as well as the subject and the object, because when these subcategorised oblique NPs are unexpressed, they give a sense of missing elements, i.e. ellipsis, for which this thesis has to account.

'Alignment' refers to a configuration or linear sequence of arguments assigned by two constraints (animacy hierarchy discussed in §4.3 and discourse salience in §4.7), which are projected onto particular grammatical relations and case markers. This is elaborated in §4.4. Note that verbs are precluded in the consideration of configuration in this thesis, since this thesis is concerned with nominal ellipsis.

'Argument structure' in this thesis refers to the structure of sentences and the alignment of arguments which are determined by the relationship between the arguments. By contrast, the usual reference of argument structure is the specification of the number and types of arguments required for well-formedness, whereby argument structure is determined by the verbal predicates.

4.2 Principle of direct alignment

In this section, I propose a principle which governs argument alignment and shapes argument structure. In the description of benefactive verbs and directional verbs in §3.2, I used the terms 'direct alignment' and 'inverse alignment', following

---

2 Exceptions are Anzai (1983) and Tsunoda (1991) who give some explanations, and they are noted in relevant sections in line with my argument.
the terms used in the description of the Algonquian languages. Direct alignment is where, on the basis of the person/animacy hierarchy, the subject is higher than non-subject (the object in the case of transitive sentence), and inverse alignment is where the subject is lower than non-subject. Although this notion of direct/inverse systems has not previously been used in the description of the grammar of Japanese in the literature, I contend that it precisely captures not only those deictic verbs discussed in §3.2, but also the mechanisms of argument structure more generally. Hence, I propose the following principle:

Principle of direct alignment in Japanese:
A sentence forms a direct alignment of arguments.

This chapter is devoted to substantiating this principle and to explaining its importance for referent identification of ellipted arguments.

The notion of direct/inverse in the principle is characterised by two constraints: Person/animacy hierarchy (discussed in §4.3) and Discourse salience (in §4.7). Discourse salience is particularly important when two arguments have the same value in the person/animacy hierarchy, for example, two third persons. I demonstrate how these constraints govern the alignment of arguments, which leads a sentence to form a certain argument structure, which further leads to a pattern of ellipsis.

4.3 Constraint 1: Person/animacy hierarchy

In §3.2, I discussed how direct and inverse verbs are determined by the person/animacy hierarchy. The person/animacy hierarchy is related to implicational universals of grammatical features such as case marking, cross-referencing, and word order in a number of languages (Blake 1987:165, also Hopper and Thompson 1980).³

³ Tsunoda (1991:45-49) shows the same idea only referring to passivization and unacceptability of inanimate subjects in transitive sentences.

⁴ According to Comrie (1981) and Mallinson and Blake (1981), this hierarchy is the major means for distinguishing objects from subjects/agents in languages with no case marking and free word order. These languages commonly use some marking on objects, when a sentence violates this hierarchy.
For example, the person or animacy of the referent controls the order of clitics and bound pronouns in a number of Australian languages (Blake 1994:139). In many languages scattered around the world, the transitive verb agrees, not with the subject, but with whichever of agent and patient is higher on the person/animacy hierarchy (Croft 1990:113). In terms of free pronouns and NPs, there are languages such as Navajo, where the higher-animacy argument always precedes the lower-animacy argument in word order (Croft 1990:114). Similarly in the Lama-Lamic languages, first and second person free pronouns precede the third person, irrespective of which is A and which is O (Rigsby 1976).

The same principle, I will show, captures the alignment of arguments in Japanese in two dimensions. One is that a higher argument on the animacy hierarchy precedes a lower argument in terms of linear order, a fact which is discussed in the next section. The other is that the subject should be higher than non-subject arguments on the animacy hierarchy, discussed below. Note that there are no clitic or bound pronouns in Japanese, so this applies to free pronouns and NPs.

This principle of direct alignment applies to the alignment of all sentences. §3.2.2 discussed the directional verbs, which are intransitive, and showed how they govern the oblique arguments of source and goal; the use of inverse directional verb signifies that the goal argument is higher than the source and the use of direct form

However, Hopper and Thompson (1980) suggest a different perspective: special marking on objects is better interpreted functionally as a signal of the high transitivity of the clause as a whole, rather than as a device for distinguishing objects/patients from subjects/agents.

Further, Comrie (1986:94) claims that the person/animacy hierarchy has a sub-hierarchy of definiteness and specificity within some languages, such as Turkish. This issue is related to ‘discourse salience’ discussed in §4.7.

5 Below is one such example from Kalkatungu (an Australian Aboriginal language, Barry Blake 1998). In both sentences, the higher argument is second person which is cross-referenced, even though the thematic role of second person is different for each sentence.

\[
\begin{align*}
\text{Nyin-ti} & \quad a=ni \quad uuwa\ marpapai? \\
\text{you-Erg (A)} & \quad \text{Purp=2sg.SB see woman} \\
\text{'Do you want to see the woman?'}
\end{align*}
\]

\[
\begin{align*}
\text{Nyin-ti} & \quad a=ni \quad uuwa\ marpapai-thu. \\
\text{you-Nom (P)} & \quad \text{Purp=2sg.OB see woman} \\
\text{'The woman wants to see you.'}
\end{align*}
\]

6 The animacy ranking of person varies from language to language; \([1>2>3]\) in Nocte, \([2>1>3]\) in Cree, \([1,2>3]\) in many languages (Croft 1990:137).
signifies the reverse. However, the principle is manifested most centrally in a transitive sentence where it may change the syntactic transitivity of the sentence. I will show in §4.5 that when arguments in a transitive sentence do not satisfy a relationship pattern of direct alignment, the sentence cannot retain its syntactic transitivity (i.e. involving an accusative marked argument) as it is. This gives rise to a different argument structure, consequently argument structure in turn signals the identity of arguments. Thus, my delineation of this principle centres around transitive sentences including di-transitive sentences, and the validity of this principle for intransitive sentences becomes apparent as the discussion progresses.

For transitive sentences, the following table was presented in §3.2 showing that 'direct alignment' occurs when the subject is higher on the hierarchy than the object (indirect object in the case of di-transitive), and 'inverse alignment' when the subject is lower on the hierarchy than the object.

| Person/animacy Hierarchy: Human (1 > 2 > 3) > Animate > Inanimate |
|-----------------------------|-----------------------------|-----------------------------|
| Direct alignment            | SB > OB                     | SB > OB                     |
| Inverse alignment           | SB < OB                     | SB < OB                     |

Figure 10.2: Direction of alignment with direct/inverse alignment

The principle of direct alignment is substantiated in the following pairs of examples. Sentences noted as (a) have a direct alignment of arguments, such as first person subject acting on third person object as in (2a), and they are acceptable. On the other hand, the (b) sentences have an inverse alignment of arguments, such as third person subject acting on first person object as in (2b), and they are marginal (highly marked or unnatural), if not unacceptable.7

7 As noted in 'Notes for examples', although the subject can be marked either by the nominative marker *ga* or the topic marker *wa*, for simplicity and consistency, *ga* is used on all subjects except for first person, unless the marking itself causes unacceptability of the sentence (see §4.7.1, Tsunoda 1991).

Furthermore, the acceptability of sentences varies in the examples, for example, (2b) is not as bad as (3b). This is differentiated by the notations - "*", '(*)', '??', '?' (in ascending order of acceptance), which may be on the basis of grammaticality or semantic ambiguity of the sentence. '*" is basically unacceptable and '?' marginally acceptable. In §4.10, I discuss the factors responsible for the variation in acceptability.

Some speakers of Japanese may find some (b) sentences not all that unacceptable. §4.10.5 will show that when arguments are overt, the principle of direct alignment can sometimes tolerate
(2a) [1->3] (first person acting on third person)

Watashi-wa Taro-o mitsuke-ta.
1sg-Top Taro-OB find-Past
'I found Taro.'

(2b) [3->1] (third person acting on first person)

?? Taro-ga watashi-o mitsuke-ta.
Taro-SB 1sg-OB find-Past
'Taro found me.'

(3a) [1->2] (first person acting on second person)

Watashi-wa anata-ni hon-o age-ta.
1sg-Top 2sg-IO book-OB give-Past
'I gave you the book.'

(3b) [2->1] (second person acting on first person)

* Anata-ga watashi-ni hon-o age-ta.
-IO 1sg-IO book-OB give-Past
'You gave me the book.'

(4a) [3->Animate] (third person subject acting on animal)

Taro-ga neko-o hii-ta.
-SB cat-OB run over-Past
'Taro ran over a cat.'

(4b) [IA -> 3] (inanimate (IA) subject acting on third person)

?? Kuruma-ga Taro-o hii-ta.
car-SB -OB run over-Past
'A car ran over Taro.'

In English by comparison, semantic and pragmatic implications aside, the inverse alignment of arguments in terms of the animacy hierarchy is generally grammatical and also is quite common, as seen in the translation for the above examples. There are numerous other examples of this type in English and some further examples are listed below:

(5) [3->1] He paid me.

(6) [IA->2] That mistake cost you a job.
However, the principle of direct alignment also seems to apply in English when certain verbs are involved. When verbs such as 'to send', as in (7a,b), are used, the direction of the alignment is not constrained. However, when verbs such as 'to hear' and 'to receive', as in (8a,b) (Kuno 1987:218), and 'to meet' as in (9a,b) (Ohso, 1976:90) are used, an inverse alignment of arguments is marked and only used in a restricted context:

\[(7a) \ [1->3] \ I \ sent \ it \ to \ Taro. \]
\[(7b) \ [3->1] \ Taro \ sent \ it \ to \ me. \]
\[(8a) \ [1->3] \ I \ received/heard \ it \ from \ Taro. \]
\[(8b) \ [3->1] \ ? \ Taro \ received/heard \ it \ from \ me. \]
\[(9a) \ [1->3] \ I \ met \ Taro. \]
\[(9b) \ [3->1] \ ? \ Taro \ met \ me. \]

At this point, two obvious questions emerge from these examples. Firstly, what happens when two arguments are both third person, namely, a third person acting on another third person? Recall that the direction of alignment in Japanese is determined not only by the person/animacy hierarchy, but also by the other constraint ‘discourse salience’. Discourse salience is most critical in accounting for sentences with two arguments of the same person/animacy hierarchical value, which the person/animacy hierarchy cannot resolve, though the effect of discourse salience is not restricted to such a situation. Detailed discussion of discourse salience has to be deferred to §4.7. Secondly, how is the content of the unacceptable (b) sentences expressed in Japanese? This is discussed in §4.4 and §4.5.

4.4 **Comparison with the notion of word order**

As mentioned earlier, direct alignment has two dimensions to be considered: the actual ordering of arguments so as to be direct (a higher-animacy argument followed by a lower-animacy argument) and the subject so as to be higher than the

---

8 However, the principle does not seem to be enforced in future tense, as the sentences become acceptable, i.e. 'Taro will receive/hear from me' and 'Taro will/can meet me'. This de-restriction seems to parallel the instances of the de-restriction of epistemological morphemes in Japanese observed in §3.4.5.
object on the animacy hierarchy. Alignment is a projection of an argument onto a specific grammatical relation in terms of animacy, hence direct alignment is where an argument high on the animacy is mapped onto the subject (or onto other grammatical relations for certain constructions, see §4.6) (see Rosen 1990 for Southern Tiwa, Evans 1997 for Mayali). This is significantly different from the more common approaches which map arguments onto particular grammatical relations in terms of their thematic roles.

In this section, I demonstrate that alignment is not exactly comparable to the notion of ‘word order’ used as a typological parameter. All the examples from (2a) to (4b) have the basic Japanese word order of SO (only NPs are of concern in this thesis). When, as is often the case, the subject is higher on the animacy hierarchy than the object, as in (2a), (3a) and (4a), the sentence coincides with the basic Japanese word order and therefore the notion of word order seems to describe the alignment of arguments in Japanese.

However, word order does not fully capture the principle governing for the alignment of arguments for two reasons. Firstly, it cannot explain why (2b), (3b) and (4b) are unacceptable. Secondly, the issue of word order flexibility needs to be clarified in relation to direct alignment.

It is the dominant view in the literature that the order of arguments in Japanese is relatively flexible (e.g. Makino & Tsutsui 1986, Shibatani 1990, Kuroda 1992, Tohsaku 1994, Kameyama 1995); namely, SO is the basic order but OS is also acceptable. This is a tenable claim in view of the fact that the use of case marking specifies the case functions of arguments without relying on the word order or other means, permitting order to be flexible. Thus, theoretically speaking, if the flexibility of word order is utilised in the unacceptable sentences of (2b), (3b) and (4b) by swapping the position of the arguments, i.e. having OS order, the sentences should become acceptable, if the meaning of direct alignment were simply a matter of word order, because the alignment of arguments would then be direct, i.e. a higher argument is followed by a lower argument. However, these sentences are still unacceptable, or at best marginal, as shown below:
This suggests that when an underlying transitive structure shows an inverse alignment, it is not sufficient to simply swap the position of arguments as in (2b)', (3b)' and (4b)' to make the sentence into a superficially direct alignment. It is the underlying structure of the sentence which must have a direct alignment. Only then can an OS sentence be acceptable. This is shown by the fact that if an underlying sentence has a direct alignment, as in (2a), (3a) and (4a), it can have OS order, despite the fact that the OS now shows an inverse alignment on the surface:

Although these examples are not unacceptable, they sound marked, namely, they are less acceptable than those with SO and direct alignment. This suggests that
underlying structure is of greater significance to the principle of direct alignment than the surface alignment itself, but in principle the linear order of arguments (i.e. the surface alignment) as well as the order in terms of animacy hierarchy need to be satisfied. That is to say, the subject is higher than non-subject in terms of the animacy and precedes non-subject in order. Consequently, the OS order is dispreferred. This is statistically supported by the findings in §4.9 which show that the OS order occurs very infrequently in actual texts. §4.10.1 explains that the infrequent occurrence of the marked alignment OS is triggered by focus of the object.

Now, the question is, if OS order is not a solution for alignment in these unacceptable sentences, how are such meanings expressed in Japanese? The next section provides answers to this question.

4.5 Restructuring inverse alignments of arguments

When a sentence shows an inverse alignment, it can no longer retain its syntactic transitivity as it is. There are various ways to express the logical content of such a sentence, as the following subsections show.

4.5.1 Inverse verbs

When a sentence has an inverse alignment in its underlying structure, one way of satisfactorily expressing the logical content of the sentence is to use an inverse verb. The use of an inverse verb signals that the alignment is not direct but inverse. This renders a sentence with inverse alignment acceptable. As described in §3.2, there are two inverse verbs: the benefactive verb *kureru* ‘to give’ (§3.2.1) and the directional verb *kuru* ‘to come’ (§3.2.2). Some of the examples observed in §3.2 are repeated below to show how sentences with an inverse alignment become acceptable when the inverse verb is used. (10) has the same logical content as (3b) which was unacceptable. Because (10) is marked by an inverse verb, it is now acceptable.

(10) [2->1] Inverse benefactive verb
あなたが私に本をあげた。
*Anata-ga watashi-ni hon-o kure-ta.*
2sg-SB 1sg-IO book-OB give [Inverse]-Past
'You gave me the book.' = (3b)

(11) [3->1] Inverse directional verb
太郎が私のところにきた。
Taro-ga watashi-no tokoro ni ki-ta.
-SB 1sg-Gen place to come[Inverse]-Past
'Taro came to my place.'

Notice in (11) that since the directional verb kuru 'to come' is an intransitive, it does not subcategorise an object. However, the subject still has to be in a direct alignment with the oblique argument, the destination watashi-no tokoro ni in this case. The fact that the inverse verb is used in (11) signals that the oblique argument is higher than the subject. This is reflected in the translation. Thus, the principle of direct alignment applies to intransitive sentences as well as transitive sentences.

As discussed in §3.2, even though there are only two such inverse verbs, they are highly productive, because they are frequently suffixed to other verbs, having an extended use as serial verbs.

(12) [2->1] Serialised use of inverse benefactive verb
あなたが私に本を買ってくれた。
Anata-ga watashi-ni hon-o kat-te kure-ta.
-2sg-SB 1sg-IO book-OB buy and give[Inverse]-Past
'You bought me the book.'

(13) [3->1] Serialised use of inverse directional verb
太郎が私に電話してきた。
Taro-ga watashi-ni denwashi-te ki-ta.
-SB 1sg-IO telephone-and come[Inverse]-Past
'Taro called me.'

§3.2 also showed that the converse verb offers another solution in situations which would otherwise violate the principle of direct alignment, although by this, I am not suggesting that benefactive constructions are underlying structures and all converses are surface structures deriving from benefactive constructions. In (14), the converse verb is used in place of the inverse verb and the underlying structure is restructured; the underlying subject is turned into an oblique, and the underlying indirect object into the subject:

(14) [1->2] Converse
私はあなたに本をもらった。
Watashi-wa anata-ni hon-o mora-ta.
1sg-Top 2sg-Obl book-OB receive-Past
We can draw the following formulae summarising the discussion in this subsection, showing how sentences with inverse alignment can be restructured into acceptable sentences using the inverse verbs or the converse verbs:

<table>
<thead>
<tr>
<th>underlying structure</th>
<th>restructured sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverse (benefactive verb): (Sl\ IO_h\ O_l\ Vt)</td>
<td>(Sl\ IO_h\ O_l\ Vt[\text{inverse}])</td>
</tr>
<tr>
<td>Inverse (directional verb): (Sl\ Obl_h\ Obl_m\ Vi)</td>
<td>(Sl\ Obl_h\ Obl_m)</td>
</tr>
<tr>
<td>Inverse (serialised use): (Sl\ O_h\ Vt)</td>
<td>(Sl\ O_h\ Vt+V[\text{inverse}])</td>
</tr>
<tr>
<td>Converse: (S_m\ IO_h\ O_l\ Vt)</td>
<td>(S_h\ Obl_m\ O_l\ Vt[\text{converse}])</td>
</tr>
</tbody>
</table>

In terms of inverse constructions, the underlying structures remain the same but they are marked by inverse verbs. In terms of converse constructions, the underlying low-animacy subject is expressed as oblique and the high-animacy argument as the subject.

### 4.5.2 Passive constructions

It is common cross-linguistically to restructure a sentence with inverse alignment of arguments into a passive construction, or an antipassive in ergative languages (Mallinson and Blake 1981, Comrie 1981, DeLancy 1981, Siewierska 1984, Croft 1990). However, inverse alignment in terms of the animacy hierarchy is often not the sole reason for restructuring into a passive construction (Blake 1987:166), because discourse elements are also significant (see §4.7, Foley and Van Valin 1984).

Japanese also uses passive constructions to restructure sentences with inverse alignment. For example, (15a) is unacceptable, because it violates the principle of
direct alignment, in that a lower argument (inanimate subject) acts on a higher argument (human). It becomes acceptable, however, if it is restructured as a passive (15b):\(^9\)

\[(15a)\] [IA -> 1]

車が私をはねた。

*Kuruma-ga watashi-o hane-ta.*

car-SB 1sg-OB run over [Vt]-Past

'A car ran over me.'

\[(15b)\] [1 -> IA ]

私は車にはねられた。

Watashi-wa kuruma-ni hane-

rare-ta.

1sg-Top car-Obl run over [Vt]-Pass-Past

'I was run over by a car.'

We can draw a formula for restructuring inverse into passive constructions as follows. The hierarchically lower underlying subject is expressed as an oblique and marked by the ablative case marker 'ni', the higher underlying object is expressed as the subject, this forming a direct alignment, and the verb is passivized:

\[
\text{Passive: } S_l \ O_h \ Vt \rightarrow S_h \ Obl_{ni} \ Vt^{\text{passive}}
\]

Note that although passive constructions generally reduce valency, in Japanese the verb remains morphologically transitive, and this is noted in the formula as 'Vt'. Morphological aspects of transitivity of Japanese verbs are discussed in the next subsection. As will be discussed in §4.8, the degree of transitivity has important implications for ellipsis permissibility.

4.5.3 Intransitive constructions

We have observed in §3.1.1 that Japanese has a rich morphology distinguishing the transitivity of verbs. This morphological distinction is exploited in restructuring operations that alter the direction of the alignment of arguments. The following pair of sentences show that a sentence with inverse alignment is unacceptable (16a), but will become acceptable, if it is restructured into an intransitive structure using an intransitive counterpart, as in (16b):

---

\(^9\) Tsunoda (1991:45-51) also recognises this phenomenon, though he does not use the term 'inverse', but he phrases it as 'the subject is lower than the object on the hierarchy'.

Furthermore, emotive propositions typically involve an inanimate agent and an animate experiencer; that is to say, the underlying structure shows inverse alignment. In Japanese, these sentences are expressed not by transitive sentences, as in (17a), but by intransitive constructions, as in (17b). In contrast, English commonly expresses these propositions using passives, such as 'to be excited' and 'to be interested in', as shown in the English translation (17b), although the transitive sentence as in (17a) is also acceptable:

(17a) ニュースが太郎を驚かした。
* Nyusu-ga Taro-o odorokashi-ta.
  news-SB Taro-OB surprise [Vt]-Past
  'The news surprised Taro.'

(17b) 太郎がニュースに驚いた。
  Taro-ga nyusu-ni odoroi-ta.
  -SB news-Obl surprise [Vi]-Past
  '(Lit.) Taro got surprised at the news. -> Taro was surprised at the news.'

The formula for intransitive constructions is drawn as follows. The underlying object is expressed as the subject, the underlying subject as oblique marked by *ni*, and the verb is de-transitivized. In effect, this structure now has a hierarchically high argument followed by a lower argument, forming direct alignment:

Intransitive:  $S_f$ $O_h$ $V_t$ $\rightarrow$ $S_h$ $Obl_{ni}$ $V_i$

Furthermore, as briefly mentioned in §3.1.1, the morphological transitivity distinction is observed in some di-transitive verbs in Japanese. These di-transitive verbs have two counterparts; one is a transitive, and the other is morphologically intransitive but syntactically transitive because it takes an object argument. For
example, *azukeru* [Vt] (entrust something to someone) has the morphologically intransitive counterpart *azukaru* denoted by [Vit] (entrust something for someone), where 'something' is the direct object. Jacobsen formulates the following for the pair (1992:61):

<table>
<thead>
<tr>
<th>morphologically Vt:</th>
<th>morphologically Vit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP1 (source=agent) -ga + NP2 (goal) -ni + NP3 (object) -o</td>
<td>NP2 (goal=agent) -ga + NP1 (source) -kara + NP3 (object) -o</td>
</tr>
</tbody>
</table>

**Figure 14: Two types of di-transitive verbs**

Fundamentally, these pairs of verbs parallel the relation between direct and converse verbs. These morphologically intransitive di-transitive verbs offer a solution to the violation of the principle of direct alignment in the same way as the converse verbs do. For example, (18a) is unacceptable because it shows an inverse alignment, but the logical content of (18a) can be expressed as (18b) using a morphologically intransitive di-transitive verb and be acceptable:

(18a)  [3->1]
太郎が私に英語を教えた。
*Taro-ga watashi-ni eigo-o oshie-ta.  
-SB 1sg-IO English-OB teach [Vt]-Past
'Taro taught me English.'

(18b)  [1->3]
私は太郎に英語を教わった。
Watashi-wa Taro-ni eigo-o osowat-ta.
1sg-Top -Obl English-OB got taught[Vit]-Past
'(lit.) I got taught English by Taro.' = (18a)

The findings from this subsection are incorporated into Table 9.1 from the discussion of inverse verbs in §3.2, and shown as Table 9.2 below:

**Table 9.2 : Forms of Direct, Inverse and Converse verbs**

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Inverse</th>
<th>Converse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefactive verbs</td>
<td>ageru</td>
<td>kureru</td>
<td>morau</td>
</tr>
<tr>
<td>give</td>
<td>give</td>
<td>give</td>
<td>receive</td>
</tr>
<tr>
<td>Directional verbs</td>
<td>----</td>
<td>kuru</td>
<td>iku</td>
</tr>
<tr>
<td>----</td>
<td>come</td>
<td>go</td>
<td></td>
</tr>
<tr>
<td>Other verbs</td>
<td>nurasu</td>
<td>----</td>
<td>nureru</td>
</tr>
<tr>
<td>wet [Vt]</td>
<td></td>
<td></td>
<td>get wet [Vi]</td>
</tr>
<tr>
<td>mitsukeru</td>
<td>----</td>
<td>mitsukaru</td>
<td></td>
</tr>
<tr>
<td>find [Vt]</td>
<td></td>
<td></td>
<td>get found [Vi]</td>
</tr>
</tbody>
</table>
Di-transitive verbs

<table>
<thead>
<tr>
<th>Vt</th>
<th>Vi</th>
</tr>
</thead>
<tbody>
<tr>
<td>oshieru</td>
<td>osowaru</td>
</tr>
<tr>
<td>teach</td>
<td>get taught</td>
</tr>
<tr>
<td>azukeru</td>
<td>azukaru</td>
</tr>
<tr>
<td>entrust</td>
<td>entrust</td>
</tr>
<tr>
<td>sazukeru</td>
<td>sazukaru</td>
</tr>
<tr>
<td>endow</td>
<td>receive</td>
</tr>
<tr>
<td>kasu</td>
<td>kariru</td>
</tr>
<tr>
<td>lend</td>
<td>borrow</td>
</tr>
</tbody>
</table>

The intransitive constructions, including intransitive di-transitive constructions, parallel unaccusative sentences (Perlmutter 1978) where the subject is the patient, and middle voice constructions, such as, 'This tape copies well.' They also resemble passive and converse constructions syntactically and semantically, in that the hierarchically lower underlying subject is expressed as oblique and marked by the ablative case marker 'kara', while the higher underlying object is expressed as the subject to form a direct alignment. The difference is that the verb is de-transitive instead of passive or converse.

Interestingly, transitive sentences that have corresponding intransitive constructions may be restricted as to whether or not they can be passivized. For example, (16a) cannot be passivized, while (18a) can, as in (18a)', which has a strong adversative sense. Nor are the corresponding intransitive constructions possible, as shown in (16b)' and (18b)':

(16a)' *Watashi-wa* ame-ni *nuras-*are-ta.
   1sg-Top       rain-Obl    wet[Vt]-Pass-Past
   'I was wet by the rain.'

(18a)' *Watashi-wa* Taro-ni *eigo-o* oshie-*are-*ta.
   1sg-Top      -Obl    English-OB teach[Vt]-Pass-Past
   'I was taught English by Taro.'

(16b)' *Watashi-wa* ame-ni *nure-*are-ta.
   1sg-Top     rain-Obl    wet[Vi]-Pass-Past
   'I was wet by the rain.'

(18b)' *Watashi-wa* Taro-ni *eigo-o* osowa-*are-*ta.
   1sg-Top      -Obl    English-OB teach [Vi]-Pass-Past
'(lit.) I was taught English by Taro.'

This is despite the well known Japanese phenomenon of passivizing some intransitive sentences as well as transitive sentences (e.g. Shibatani 1985, 1990), for example:  

(19) 太郎が子供に泣かれた。
Taro-ga kodomo-ni nak-are-ta.
'Taro-SB child-Obl cry[Vi]-Pass-Past
'(Lit.) A child cried on Taro. -> Taro was (adversely affected) by a child's crying.'

It is plausible to assume, therefore, that these intransitive constructions cannot be passivized, because they already denote the logical content of the corresponding passive, so that passivization is superfluous. We saw comparable examples with inverse and direct verbs in §3.2.1.2, where a direct verb that has a corresponding inverse verb cannot always be passivized.

Hence, sentences with inverse alignment have the option of being restructured into passives or into intransitive sentences. However, some of these corresponding intransitive sentences cannot be passivized. Passive sentences tend to convey that the patient is victimised, while intransitive sentences defocus the agent-patient relationship and focus more on the spontaneity of the action.

4.5.4 Existential constructions

We observed in §3.2.2 that sentences with direct alignment, such as 'I called Taro' repeated in (20a), are acceptable, but sentences with inverse alignment, such as 'Taro called me' as in (20b), are unacceptable. However, they become acceptable if they are marked by the inverse verb, as shown in (20c).

10 This sort of sentence is called an 'indirect passive' sentence, and generally, but not always, denotes adversity, as shown below:

Taro-wa kireina josei-ni hanashikake-rare te yorokonde iru.
'Taro is happy, because he was talked to by a beautiful woman.'

Indirect passive can be intransitive, as in example (19), or transitive, as shown below:

Watashi-wa haha-ni to-o shime-rare-ta.
'(Lit) I was shut the door by my mother. -->My mother shut the door on me.'

These examples show that the arguments in indirect passive also conform to the principle of direct alignment.
In this subsection, I show how the existential construction is another solution for dealing with sentences with inverse alignment. For example, (20b) becomes acceptable, if it is restructured into an existential construction using the existential verb *aru*, as shown in (21a). The inverse verb *kuru* (*ki-ta* is an allomorph of *ku-ru* used in the past tense) can be used instead of the existential verb, as shown in (21b).

(21a) [3->1]  
太郎から私に電話があった。
*Taro-kara watashi-ni denwa-ga at-ta.*  
-Abl 1sg-Alla telephone-SB exist-Past  
'There was a call for me from Taro. -> Taro called me.' (=20c)

(21b) [3->1]  
私に太郎から電話がきた。
*Taro-kara watashi-ni denwa-ga ki-ta.*  
-Abl 1sg-Alla telephone-SB come[Inverse]-Past  
'A call came to me from Taro. -> Taro called me.' (=20c)

Thus, (20a) with direct alignment and (21a/21b) with inverse alignment are in complementary distribution. That is to say, a different sentence construction is chosen depending on the relationship between the two arguments with respect to their hierarchical values: when the agent caller is higher on the person/animacy hierarchy than the receiver of the call, a transitive sentence is chosen, as in (20a), while in the

---

11 The verb in (20a) can be expressed by a Sino-Japanese verb as *denwa-shi-ta* 'telephoned'.

12 Cross-linguistically, existentials and antipassives are used to change the direction of alignment (Comrie 1981).
reverse case, either the existential construction, as in (21a) or (21b) with the directional inverse form, will be chosen.¹³ This means that sentences with direct alignment, such as 'I called Taro', cannot be expressed using the existential construction, such as (21c):

(21c)  [1->3]  *[From me to other]

Watashi-kara Taro-ni denwa-ga at-ta.
1sg-Abl -Alla telephone-SB exist-Past
'There was a call from me to Taro. -->> I called Taro.'

By virtue of this complementary distribution, the structure of these sentences provides information about the relationship between the arguments, which is vital for determining referential identity under ellipsis (see §5.3).

The unacceptability of (21c) is also explained from the 'speaker-oriented / ego-centric (centripetal)' nature of the Japanese directional verbs discussed in §3.2.2. This is because 'from me to others' violates this orientation. But then, in a sense the existential construction shows an inverse alignment, i.e. 'from low argument to high argument', even though these arguments are not core arguments and the sentences are acceptable. For this reason, corresponding sentences with direct alignment, i.e. 'to high argument from low argument' sound more unmarked.¹⁴

(21a)  Watashi-ni Taro-kara denwa-ga at-ta.
1sg-Alla -Abl telephone-SB exist-Past
'There was a call for me from Taro. -->> Taro called me.'

(21b)  Watashi-ni Taro-kara denwa-ga ki-ta.
1sg-Alla -Abl telephone-SB come[Inverse]-Past
'A call came to me from Taro. -->> Taro called me.'

The construction for 'making a telephone call' in (21) parallels the construction for the 'writing a letter' examples of (23) and (24) from §3.2.2. A transitive construction is acceptable only when the relationship between the

---

¹³ Sentences involving third person calling another third person [3->3] are dealt under the second constraint of discourse salience discussed in §4.7.

¹⁴ Analogously in English, it is more natural to form a direct alignment and say 'There was a call for me from Taro' than 'There was a call from Taro to me', although such a meaning is conventionalised to form as 'from X to Y'.
arguments shows direct alignment, as in (22a) below. But when a sentence shows inverse alignment as in (22b), it must be restructured as an existential construction, using either the existential verb, as in (22c), or the directional inverse verb, as in (22d):  

(22a) [1->3]  
Watashi-wa Taro-ni tegami-o kai-ta.  
1sg-Top Taro-IO letter-OB write-Past  
'I wrote a letter to Taro.'

(22b) [3->1]  
(* Taro-ga watashi-ni tegami-o kai-ta.  
Taro-SB 1sg-IO letter-OB write-Past  
'Taro wrote a letter to me.'  

(22c) Existential verb  
Taro-kara watashi-ni tegami-ga a-ta.  
Taro-from 1sg-to letter-SB exist-Past  
'There was a letter to me from Taro.' (=22b)

(22d) Directional inverse verb  
Taro-kara watashi-ni tegami-ga ki-ta.  
Taro-from 1sg-to letter-SB come-Past  
'(Lit.) A letter came to me from Taro.' (=22b)

Since this restructuring process is rather complex, another example is given for clarification:

(23a) [1->3] Direct alignment  
Watashi-wa tomodachi-o sasot-ta.  
1sg-Top friend-OB invite-Past  
'I invited a friend.'

(23b) [3->1] Inverse alignment  
Tomodachi-ga watashi-o sasot-ta.  
friend-SB 1sg-OB invite-Past  
'A friend invited me.'

---

15 Strictly speaking, (22c,d) are not exactly identical in meaning with (22b), but the proposition is expressed commonly as (22c,d).

Some speakers of Japanese may find (22b) acceptable. As will be discussed in §4.10.5, when arguments are overt, the principle of direct alignment is tolerant of violation.
(23c) Existential verb
友だちから私に誘いがあった。
Tomodachi-kara watashi-ni sasoi-ga at-ta.
friend-from 1sg-to invitation-SB exist-Past
'(Lit.) An invitation from a friend exists for me.' (= 23b)

(23d) Directional inverse verb
友だちから私に誘いがきた。
Tomodachi-kara watashi-ni sasoi-ga ki-ta.
friend-from 1sg-to invitation-SB come[Inverse]-Past
'(Lit.) An invitation came to me from a friend.' (= 23b)

To summarise the discussion in this subsection, sentences with inverse alignment are restructured into the existential constructions using either the existential verb or the directional inverse verb in the following ways:

- the underlying subject (low) and indirect object (high) are both expressed as oblique, forming either 'from low argument to high argument' or 'to high argument from low argument', though the former is slightly marked.
- in the case of di-transitive sentences, as in (21) and (22), the underlying direct object is expressed as the subject. In the case of transitive verbs, as shown in (23), the underlying verb becomes a nominalised inanimate subject.
- the verb becomes intransitive using either the existential verb aru or the directional inverse verb kuru.

A formula for changes involving the existential constructions is as follows:

<table>
<thead>
<tr>
<th>Existential constructions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sm IOh Oj Vt --&gt; Obl[ni] Oblm [kara] S#IA Vi[existential/inverse]</td>
</tr>
<tr>
<td>-- 'S#IA' indicates that this subject is a nominalised inanimate subject derived from either the direct object or the transitive verb in the underlying structure.</td>
</tr>
</tbody>
</table>

4.6 Effect of restructuring: De-transitivization

So far we have observed five types of formulae that deal with sentences with inverse alignment through restructuring. They are summarised in the table below:

<table>
<thead>
<tr>
<th>Table 15.2: Restructuring formula (stage 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>underlying structure</td>
</tr>
</tbody>
</table>
1. use of inverse form of verbs:

- Benefactive verbs: \( S_I O_{O_I} O_f Vt \rightarrow S_I O_{O_I} O_f Vt[\text{inverse}] \)
- Directional verb: \( S_I O_{O_{V_I}} V_i \rightarrow S_I O_{O_{V_I}} V_i[\text{inverse}] \)
- Serialised usage: \( S_I O_{V_I} Vt \rightarrow S_I O_{V_I} Vt + V[\text{inverse}] \)

2. use of converse form of deictic verbs:

\( S_I O_{O_I} O_f Vt \rightarrow S_I O_{O_I} O_f Vt[\text{converse}] \)

3. use of passive constructions:

\( S_I O_{V_I} Vt \rightarrow S_I O_{V_I} Vt + V[\text{passive}] \)

4. use of intransitive constructions:

\( S_I O_{V_I} Vt \rightarrow S_I O_{V_I} V_i \)

5. use of existential constructions:

\( S_I O_{O_I} O_f Vt \rightarrow Obl_m/O_f Obl_m[\text{nij}] V_i[\text{existential/inverse}] \)

-- `'h > m > l' (i.e. high > medium > low) denotes the arguments' relative values on the person/animacy hierarchy
-- `'S#IA' signals that this subject is a nominalised inanimate subject derived from either the direct object or the transitive verb in the underlying structure.

This table shows that, except for the inverse and converse constructions, the effect of restructuring is de-transitivization; namely promoting the underlying object (or oblique) to the subject and demoting the underlying subject to oblique. The combined effect is that semantically transitive propositions are expressed as intransitive in Japanese, when the subject is lower than the object on the person/animacy hierarchy.\(^{16}\) The effect of de-transitivization is statistically confirmed in my corpus of six written narrative texts from PHP (1993, short story series and essays) and expository texts from *Nihon shakai saikoo* (Japanese society: An update, 1991), four of which have English translations. The types of sentence structures in the Japanese texts are analysed and compared with their English translation. The results are as follows:

**Table 16: Proportion of sentence structures in Japanese and English**

(\( n = 383 \) sentences for Japanese texts)

<table>
<thead>
<tr>
<th></th>
<th>Japanese</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>intransitive</td>
<td>42.8%</td>
<td>23.4%</td>
</tr>
</tbody>
</table>

\(^{16}\) Hopper and Thompson (1980:273) briefly note a similar phenomenon found in Yukulta (spoken in Queensland, Keen 1972, 1983) in their paper on transitivity; when the O is higher than the A on the hierarchy (called an anomalous A-O relation), the sentence is restructured to an intransitive sentence. They claim that this type of de-transitivization is caused by the reduction of the 'agency' of the subject, not by the fact that the O is high on the hierarchy.
The results show that Japanese presents information using intransitive sentences far more often than English does. In other words, what would be transitive (and passives) in English may be expressed as intransitive in Japanese. I claim that the higher proportion of intransitive structures in Japanese is largely the result of the restructuring mechanisms observed in this chapter. That is to say, the frequent use of intransitive sentences verifies the principle of direct alignment. Notice also that the rate for passive is much lower for Japanese than for English. This supports my claim in §4.5.3 that where intransitive constructions are available for restructuring, corresponding passive sentences are either unacceptable or highly marked. In effect, the availability of intransitive constructions makes the use of some passive constructions superfluous. Also, the use of passive tends to convey an adversative sense, and hence is normally avoided, in favour of intransitive constructions.

The preference for intransitive constructions is, as mentioned in §1.7.4, a widely recognised characteristic of Japanese and is related to several other constructions. We have observed in §3.3 that honorifics and inchoative constructions have the same de-transitivizing effect. The following subsections discuss how the preference for intransitive constructions and the principle of direct alignment affect 'low-transitive sentences' (§4.6.1) and 'constructions with inanimate arguments' (§4.6.2).

### 4.6.1 Low-transitive sentences

Low-transitive sentences refer to such constructions as ‘dative subject constructions’, shown in (24), and ‘topic constructions’, as in (25):

(24)  [1->3]

\[
\text{Watashi-ni kodomo-ga iru.}
\]

1sg-DatSB child-NomOB exist

---

**Table 4.1**

<table>
<thead>
<tr>
<th></th>
<th>Japanese</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>transitive</td>
<td>29.5%</td>
<td>36.1%</td>
</tr>
<tr>
<td>passive</td>
<td>5.5%</td>
<td>14.4%</td>
</tr>
<tr>
<td>copula</td>
<td>22.6%</td>
<td>26.1%</td>
</tr>
</tbody>
</table>

100% 100%
'(Lit.) On me, a child exists.  --> I have a child.'

(25) [3->IA]

太郎は英語がわかる。
Taro-wa eigo-ga wakaru.
Taro-Top English-NomOB understand
'Taro understands English.'

These sentences express emotions, possession, states, and the like which do not involve prototypical agent and patient roles found in high-transitive sentences (see Hopper & Thompson 1980, Watanabe 1984). In other words, sentences are identified as low-transitive from the semantics of the verbal predicates. Low-transitive sentences select two arguments, but these arguments take non-prototypical markers; the prototypical subject is marked by the topic marker or the dative, and the prototypical object is marked by the nominative (see Shibatani 1990). Thus, these markers are glossed in the examples as Top (topic), DatSB (dative subject), and NomOB (nominative object). As noted earlier, the topic marker is not a case marker, but it substitutes for the case marker of the topicalised argument, which can be the subject, object, or to some extent oblique. The notation 'Top' denotes the subject function unless otherwise specified (e.g. 'TopOB' denoting a topicalised object).

I suspect that low-transitive sentences are another example of the manifestation of the principle of direct alignment and the effect of de-transitivization. In terms of de-transitivization, although both arguments in this construction are indispensable, i.e. both are selected by the verb and the sentence is semantically transitive (Shibatani 1990:299), syntactically it has an intransitive structure: [Topic/Dative + Nominative + (intransitive) Verb]. The intransitivity is shown by

17 According to Watanabe (1989:81) in examining school texts, 5.7% of ga-marked subjects fall under these constructions. Further, dative subject constructions are found in diverse languages, such as Latin, Spanish, Russian, Kannada, Turkish (Shibatani 1982:106), and Old English. It seems to me that dative subject constructions in Japanese parallel ergative constructions, in that the object of transitive sentence is marked by the nominative which marks the subject of intransitive (i.e. absolutive in ergative), and the subject of transitive sentence is marked by the dative. Hinds (1982:17) briefly noted an analogous idea. This is plausible, since according to Dixon (1994), it is not unusual for accusative languages to have some characteristics of ergative languages and for ergative languages to have some characteristics of accusative languages.

18 Later in the section, I represent the construction more precisely, and show that adjectives and adjectival nouns with the copula can stand in place for the intransitive verb. Note also that wakaru 'to understand' is intransitive, although it is transitive in English.
the fact that it has no accusative marked arguments and that the verb is morphologically intransitive. In English, by comparison, equivalent sentences are expressed as transitive, as in the translation of the above examples, even though these sentences are semantically not high in transitivity (see Hopper and Thompson 1980).

In terms of the principle of direct alignment, the dative/topic argument always has a higher person/animacy value than the nominative marked argument, and it precedes the nominative argument in order. In other words, the arguments are aligned not by the grammatical relations, but by the person/animacy hierarchy. This alignment is fairly rigid. The rigidness of argument alignment is described in §4.9. But for now, observe the following examples which show a reversed alignment of arguments from (24) and (25); they are either unacceptable or highly marked:

(24)'. [3->1] Unacceptable

* Kodomo-ga watashi-ni iru.
child-NomOB 1sg-DatSB exist
'It is a child that I have.'

(25)'. [IA->3] Highly marked

?? Eigo-ga Taro-wa wakaru.
English-NomOB Taro-Top understand
'It is English that Taro understands .'

What happens when the semantic content of a low-transitive sentence shows an inverse alignment of arguments, such as 'Taro understands me'? Such sentences are unacceptable, as shown in (26a) below. These sentences do not follow any of the restructuring formulae that we have observed. Instead, the meaning is expressed by rephrasing the nominative marked argument, for example, 'Taro understands my feelings/affairs', as shown in (26b). This results in lowering the hierarchical value of the nominative marked argument, and it becomes lower than that of the

---

19 I am indebted to Nick Evans for this observation.

20 Tsunoda (1991:58-60) notes similar examples of the object phrase from a different perspective: considering the correlation between the use of nominaliser *koto* on the object phrase and the type of verbal predicates.
dative/topic marked argument. This rephrasing operation in effect meets the principle of direct alignment.

(26a) [3->1]
太郎に私がわかるか。
*Taro-ni watashi-ga wakaru ka.
Taro-DatSB 1sg-NomOB understand Q 'Does Taro understand me?'

(26b) [3->IA]
太郎に私の気持ちがわかるか。
Taro-ni watashi-no kimochi-ga wakaru ka.
Taro-DatSB 1sg-Gen feeling-NomOB understand Q 'Does Taro understand my feelings?'

What is significant about low-transitive sentences is that even when sentences have direct alignment, they must still be expressed as intransitive sentences. For example, even though (26c) 'I understand Taro' has a direct alignment, it is not expressed as a transitive, but must be expressed by an intransitive sentence to be acceptable, as shown in (26d).

(26c) [1->3] Transitive
* Watashi-wa Taro-o wakaru.
1sg-Top -OB understand 'I understand Taro.'

(26d) [1->IA] Low transitive
Watashi-wa/ni Taro-no kimochi-ga wakaru.22
1sg-Top/DatSB -Gen feeling-NomOB understand 'I understand Taro's feelings.'

Thus, low-transitive sentences do not have a corresponding underlying transitive sentence, and are always expressed as low-transitive sentences. I suggest that they represent a grammaticalised instance of the effect of de-transitivization and the principle of direct alignment. That is to say, the experiencer always takes the dative case or the topic marker, while the undergoer takes the nominative case. And

21 Jarkey (1999) notes that some stative predicates, such as tai 'want to do' and the potential form of verbs hanas-eru 'can speak', have the alternation of the nominative and the accusative to mark objects, in which case the sentence can be transitive. She discusses how three factors related to transitivity are particularly influential in the choice of object case marker: the nature of predicate (derived or underived), the degree of intention of the subject, and the degree of individuation of the object. However, according to my informants, those examples with the accusative marking in her paper are still marginal, even though they are less unacceptable than other sentences.

22 Later in the section, I clarify the difference between wa and ni.
in effect, the low-transitive sentences conform to the principle of direct alignment. Even though the undergoer is morpho-syntactically promoted to the subject, the argument alignment is unaffected by the grammatical relations and remains the same as that in the underlying structure. The resulting order is of Dative/Topic followed by Nominative, i.e. an argument higher on the animacy hierarchy always precedes a lower argument. This is formulated below:

| Low transitive sentences: | \text{Obl}_{[\text{ni/wa}]} \text{O}_{[\text{ga}]} \text{Vi/Adj} |

As noted in the above formula, the verbal predicate can be an adjective or an adjectival noun (so-called 'na-adjective' in language texts) with the copula, instead of an intransitive verb. Adjectives in Japanese are predicative, as they stand without the copula and have suffixes that conjugate like verbs. Generally, actions are coded by verbs and states by adjectives (Watanabe 1984:236). Below I present examples of these three types of low-transitive sentences. (27) to (29) are examples using verbs, (30) to (33) using adjectives, and (34) using an adjectival noun. I also note in the examples whether the particle of the first NP is \text{wa} or \text{ni}, or either, as in (26d). This is because the option of either is available for some sentences, but not others. This difference in particle choice has an important implication for ellipsis; \text{wa}-marked arguments can be ellipted, while \text{ni}-marked arguments are rarely ellipted (see §5.1 for discussion).

(27)
Watashi-\text{wa/ni} kodomo-ga iru.
1sg-Top/DatSB child-NomOB exist
'I have a child.'

(28)
Taro-\text{wa/ni} yama-ga mi eru.
Taro-Top/DatSB mountain-NomOB see can
'Taro can see the mountain.'

(29)
Watashi-\text{wa/ni} me-ga same-ta.
1sg-Top/DatSB eyes-NomOB wake-Past
'(lit.) For me my eyes woke up. \rightarrow I woke up./ I came to my senses.'

(30)
象は\text{wa/ni}に鼻が長い。
Zoo-wa/*ni hana-ga nagai.  
'An elephant has a long trunk.'

(31) Taro-wa/*ni kangaekata-ga furui.  
'Taro has an old-fashioned idea.'

(32) Watashi-wa/*ni atama-ga itai.  
'(lit.) For me the head is sore. --> I have a headache.'

(33) Watashi-wa/*ni mizu-ga nomi tai.  
'I want to drink some water.'

(34) Watashi-wa/*ni Taro-ga suki-da.  
'I like Taro.'

There seems to be a difference in usage between the topic marker \textit{wa} (i.e. topic constructions) and the dative marker \textit{ni} (i.e. dative subject constructions) in the above examples. Those constructions which take \textit{wa} tend to express emotive and stative propositions, and select rather agent/experiencer-like arguments using adjectives and adjectival nouns, except for (29), which uses a verb. On the other hand, those constructions which take \textit{ni} tend to select more possessor-like arguments with association of location and involve verbs.

The dative marker \textit{ni} has a number of other case functions: locative, ablative and allative, and this can be confusing. However, they all share the sense of location: the location of source, goal, or possessor. Indeed, as Heine (1997:203) states, a number of works have claimed that possessive, existential and locative constructions are related to one another, and that all these constructions are locative in their underlying structure. Consider, for instance, the following pair of syntactically identical sentences using \textit{ni}. Although \textit{ni} occupies identical positions in the

\footnote{This is a well-known example of a topic construction, used in the title of the book by Mikami (1960) which specifically addresses the topic construction.}
sentences, in (35a) the *ni*-marked argument is the dative which represents the location of the possessor of the proposition, while in (35b) it is the locative which represents the location of the existence of the nominative marked argument. The only difference between the dative and the locative in this set of examples seems to be induced by the difference in the animacy of the *ni* marked argument; animate marked *ni* is the dative (as in 35a) and inanimate marked *ni* is the locative (as in 35b).

(35a) 私に子どもがいる。
*Watashi-ni* kodomo-ga *iru.*
1sg-*Dat* child-*Nom* exist
'A child exists on me. --> I have a child.'

(35b) オーストラリアにコアラがいる。
*Oosutoraria-ni* koara-ga *iru.*
Australia-*Loc* koala-*Nom* exist
'Koalas exist in Australia. --> There are koalas in Australia.'

The pair of sentences in (36) and (37) further demonstrates this point. As we saw earlier, in (36) *watashi* cannot take the dative marker, because it has an agent type thematic role. What is interesting about (37) in contrast is that it contains both a topic marked argument and a dative marked argument. (37) shows that the topic marked argument is the experiencer and the dative marked argument is the location of the source of the proposition:

(36) 私は/*にして頭が痛い。
*Watashi-wa/*ni atama-ga *itai.*
1sg-*Top/DatSB* head-*NomOB* sore
'(lit.) For me the head is sore. --> I have a headache.'

(37) 私は子どもに頭が痛い。
*Watashi-wa* kodomo-ni atama-ga *itai.*
1sg-*Top* child-*Obl* head-*NomOB* sore
'I have a problem with (my) children.'

In §5.1, I will elaborate on this issue by showing that agent- and experiencer-like arguments marked by *wa* can be ellipted, while possessive arguments marked *ni* are hard to elide.

4.6.2 Constructions with inanimate arguments
The effect of de-transitivization extends to sentences where the subject and object are both inanimate, despite the fact that these sentences do not violate the principle of direct alignment in terms of the person/animacy hierarchy. The following examples show that (38a) and (39a) using transitive structures are stylistically infelicitous or highly marked, while the same messages expressed in intransitive sentences in (38b) and (39b) respectively are much more natural (see Anzai 1983:43):

(38a) 風邪が花瓶をこわした。
     (* Kaze-ga kabin-o kowashi-ta.
     wind-SB vase-OB break[Vt]-Past
     'Wind broke the vase.'

(38b) 風邪で花瓶がこわれた。
     Kaze-de kabin-ga koware-ta.
     wind-Obl vase-SB break[Vi]-Past
     'The vase got broken by the wind.'

(39a) 父の一言が入院を決めた。
     (* Chichi-no hitokoto-ga nyuuin-o kime-ta.
     father-Gen one word-SB hospitalisation-OB decide[Vt]-Past
     '(Lit.) My father's word has decided the hospitalisation.
     --> My father has decided to put (me/someone) in the hospital.'

(39b) 父の一言で入院が決まった。
     Chichi-no hitokoto-de nyuuin-ga kimat-ta.
     father-Gen one word-Obl hospitalisation-SB decide[Vi]-Past
     '(Lit.) The hospitalisation got decided with my father's word.'

Thus, the restructuring occurs when the subject and object are both inanimate, despite the fact that the structure does not show an inverse alignment in terms of the person/animacy hierarchy. This results in de-transitivization.

The de-transitivization under this construction is due to the unacceptability of inanimate subjects in transitive sentences in Japanese, as a number of works have pointed out (see §4.1). Why is it that inanimate arguments are unacceptable as the subjects of transitive sentences? It is because of the volitionality associated with the role of transitive subject. Subjects of transitive sentences are strongly associated with the agent role. An inanimate agent does not have volition or intention for the action,\(^{24}\) hence it is marked not by the prototypical agent marking of the subject, but

\(^{24}\) An analogous phenomenon is reported in Acehnese, where actors/agents are always animate and volitional (Durie 1988:6).
by the instrumental case marker 'de' (which denotes cause/reason for (39b)). For the same reason, (38a) cannot be turned into a passive sentence, as shown (38c).

\[(38c)\] 花瓶が風にこわされた。

* Kabin-ga kaze-ni kowa-sare-ta.
  vase-SB wind-Obl break-Pass-Past
  'The vase was broken by the wind.'

However, an agent-patient type relationship does exist between these two inanimate arguments, and this is reflected in the alignment of arguments as AP (agent followed by patient).\(^{25}\) Importantly, restructuring into intransitive sentences does not change the order of arguments in (38a,b) and (39a,b). This in effect follows the principle of direct alignment.

Thus, sentences go through the following restructuring, if their subject and object are both inanimate, which results in de-transitivization:\(^{26}\)

\[
\text{Inanimate agent: } S_A \ O_p \ V_t \rightarrow \text{Obl}_A \{\text{de}\} \ S_p \ V_i
\]

The de-transitivization under this reconfiguration is another example of the Japanese preference for intransitive sentences. Transitive sentences with two inanimate arguments are grammatical in English, for example, 'This shirt needs washing', though their transitivity is not high and they cannot be passivized. However, these sentences cannot be translated into Japanese as transitive.

Another instance of what would be a transitive sentence in English being expressed as an intransitive in Japanese follows. According to Mizutani (1995:25), 51% of subjunctive (hypothetical/conditional) sentences (i.e. complex sentences) in Japanese are expressed by simple transitive sentences in English, as shown below. Tsunoda (1991:51) and Anzai (1983:81) make a similar point.

\(^{25}\) Tsunoda (1991:49) places some inanimate arguments higher on the animacy hierarchy, if they have natural power, such as wind.

\(^{26}\) Even though sentences with two inanimate arguments are discussed here as one example of de-transitivization, they have more relevance on the second constraint 'discourse salience' for two reasons. One is because two arguments in these sentences do not violate the principle of direct alignment in terms of the person/animacy hierarchy. The other is because agentivity is dealt under discourse salience (see §4.7).
When you travel, you taste unexpected sentiments.

The following is an interesting example which frequently occurs. An inanimate argument functions like the semantic subject in a transitive sentence, but is marked by the locative. This occurs when an inanimate argument is used metonymically and represents a group of people or an organisation (example modified from Tsunoda 1991):

The University of Melbourne is recruiting students.

Syntactically, (41) is definitely a transitive sentence, since it has an object. However, there is no argument that is marked by the prototypical subject marker. Technically, it could be interpreted as 'At the University of Melbourne, (people) are recruiting students', whereby the unspecified subject is ellipted and the University of Melbourne represents the location. However, semantically, the more likely interpretation is that the subject argument is 'the University of Melbourne', but it is marked by the locative marker de. I suspect that this deviant marking is the result of the fact that the subject is inanimate. When the inanimate argument is topicalised, it is marked by wa. Then, it can be seen as having the function of the subject, since the topic marker can substitute for the case marker of the argument. However, wa can be suffixed to the particle instead of replacing it, then both markers appear as dewa, showing that the underlying marker is de. Analogous statements are found in Nakaiwa and Ikehara (1995:97); some sentences typically do not have the subject but have a locative, and these sentences are translated into English using a transitive sentence 'X raise Y':

ø-ga X(facility)-de Y(animals)-o kau.
-SB -Loc -OB keep
'ø is keeping Y at X. --> X raises Y.'

To summarise §4.5 and §4.6 before introducing the second constraint, we find that sentences that are transitive in English are often expressed as intransitive in
Japanese. They can also be turned into complex sentences, as in (40), or keep their transitivity but express the semantic subject as an oblique, suppressing the syntactic subject which is unspecific, as in (41). Furthermore, we have observed four different types of intransitive sentences: [1] canonical intransitive, as in (43), [2] restructured intransitive by the principle of direct alignment, as in (44) and (45), [3] low transitive sentences, as in (46), and [4] constructions with inanimate arguments, as in (47):

(43) Canonical intransitive

太郎が歩いている。

*Taro-ga arui-teiru.*

-TS walk-Impf(Continuous)

'Taro is walking.'

(44) Restructured intransitive

太郎がニュースに驚いた。

*Taro-ga nyuusu-ni odoroi-ta.*

-SB news-Obl surprise [*V]-Past

'(Lit.) Taro got surprised by the news.'

(45) Restructured intransitive (existential)

太郎から私に電話があった。

*Taro-kara watashi-ni denwa-ga at-ta.*

-Abl 1sg-Alla telephone-SB exist-Past

'There was a call for me from Taro. -> Taro called me.'

(46) Low-transitive

太郎に英語がわかる。

*Taro-ni eigo-ga wakaru.*

Taro-DatSB English-NomOB understand

'Taro understands English.'

(47) Constructions with inanimate arguments

風で花瓶がこわれた。

*Kaze-de kabin-ga koware-ta.*

-wind-Obl vase-SB break[*V]-Past

'The vase got broken by the wind.'

4.7 Constraint 2: Discourse salience

So far I have shown that sentences in Japanese are constrained to reflect direct alignment in terms of the person/animacy hierarchy. In this section, I demonstrate that discourse salience is another constraint which influences the alignment of arguments. The principle of direct alignment must be satisfied by discourse salience as well as the person/animacy hierarchy; otherwise sentences are restructured in the
manner laid out in §4.5. I demonstrate the importance of discourse salience as a constraint by focusing on situations where the person/animacy hierarchical values do not differ hence do not determine alignment, for example, a third person human argument acting on another third person human. Under these circumstances, discourse salience is the only factor which determines the direction of alignment of arguments and affects the acceptability of sentences.

4.7.1 Discourse salience in relation to Person/animacy Hierarchy

Discourse salience refers to discourse values of arguments in terms of topicality and referentiality (prior mention). Topicalised and referential arguments are high in discourse salience and have the propensity to be placed before arguments that are lower in discourse salience in the sentence. Discourse salience has a strong correlation with the person/animacy hierarchy, as shown below:

<table>
<thead>
<tr>
<th>Person/animacy Hierarchy:</th>
<th>1 &gt; 2 &gt; 3 &gt; animate &gt; inanimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discourse salience (topic, referentiality):</td>
<td>[high] &gt; [low]</td>
</tr>
</tbody>
</table>

Figure 15: Discourse salience in relation to Person/animacy Hierarchy

The figure indicates that the higher an argument is on the person/animacy hierarchy, the more likely it is to be the topic and referential. The highest in discourse salience is the case where an argument is topical as well as referential, while low in discourse salience is the case where an argument is referential but not topical. For example, a sentence contains two arguments that are both referential but only one of them is coreferential with the topic. (See §6.3.2 for the discussion of multiple ellipses.)

The correlation between the person/animacy hierarchy and discourse salience has been suggested in a number of works (e.g. Kuno 1976:443, Hopper and Thompson 1980:286, Mallinson and Blake 1981:107, Comrie 1981:114, 121), and it also includes subjecthood (i.e. syntax), agentivity and definiteness (i.e. semantics), in that the higher an argument is on the person/animacy hierarchy and in discourse salience, the more likely it is to be the subject, agent and definite. For example, first
person, which is the highest argument on the hierarchy, is most likely to have the highest value in discourse salience as well as being the subject, definite and agent.\textsuperscript{27}

The correlation is also reflected in the type of unmarked subject marker. Subjects in Japanese are generally marked by the nominative marker \textit{ga} or the topic marker \textit{wa}. However, the higher an argument is in discourse salience and the animacy hierarchy, the more the topic marker tends to be used as the unmarked subject marker (Tsunoda 1991). This correlation is understandable, because the higher an argument is in discourse salience, the more likely it is to be topicalised. On the other hand, the lower an argument is in discourse salience and on the animacy hierarchy, the more the nominative marker is used as the unmarked subject marker (op. cit.). For this reason, unmarked subjects are marked by \textit{ga} except for first person in all of the examples used in this thesis. The correlation is shown in Figure 16:

<table>
<thead>
<tr>
<th>Person/animacy hierarchy:</th>
<th>1 &gt; 2 &gt; 3 &gt; animate &gt; inanimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discourse salience:</td>
<td>[high] &gt; [low]</td>
</tr>
<tr>
<td>Unmarked subject marker:</td>
<td>\textit{wa} \rightarrow \textit{ga}</td>
</tr>
</tbody>
</table>

\textbf{Figure 16: Correlation between unmarked subject markers and the animacy hierarchy / discourse salience}

In trying to understand the relationship between the person/animacy hierarchy and discourse salience, two questions emerge. Firstly, since the correlation between the person/animacy hierarchy and discourse salience is significant, do we need to keep both constraints? Secondly, if we do, which of the two is the prime factor governing the alignment of arguments? I answer these questions together.

The situation which most critically needs the two constraints is where a sentence has two arguments with the same hierarchical values. In this situation, the hierarchy cannot determine the alignment of arguments, and hence it is the discourse salience that determines it. There are three cases in which arguments have the same hierarchical values: arguments may be either both third person human, both animate, etc.

\textsuperscript{27} Hopper and Thompson (1980:290) have statistically shown the correlation that cross-linguistically the subject of a sentence is typically animate and definite, and the object is typically inanimate and indefinite.
or both inanimate. Hierarchical equivalence is most critical in sentences with two third person arguments. This [3->3] is the topic of the next subsection. Sentences with two animal arguments are somewhat problematic, as mentioned in §3.2.1, in that animals elusively split between human (i.e. animate) and inanimate depending on the subjective perception of the speaker on the basis of elements, such as affinity with the speaker (e.g. pet or generic reference) and size (e.g. lion or lizard). Similarly, some inanimate arguments are treated as animate when they possess movement of growth and natural power such as typhoons which can act on other things and people (see Tsunoda 1991:49). Examples for sentences with two inanimate arguments have already been observed in §4.6.2; the structure of sentences with two inanimate arguments triggers de-transitivization due to the lack of agentivity which plays a part in discourse salience.

Furthermore, some sentences do not exhibit the correlation between the person/animacy hierarchy and discourse salience, and hence the two constraints cannot be merged. For example, one argument X has a higher value on the animacy hierarchy than the other Y in the same sentence, for example, first person, but Y has a higher topical or referential value than X, for example, a discourse topic (see §5.5.3 for examples). This relates to the second question - which of the two constraints is the prime factor governing the alignment of arguments. As will be shown in §4.10.3, this depends on the difference in the integrated value of the two arguments, and depends on the relative height of the higher argument. §5.5.3 will also elaborate the issue.

### 4.7.2 Two third person arguments

When a sentence involves two third person arguments, those two arguments are generally not treated in the same way, because one of them will tend to be more salient than the other in the discourse concerned, for example:

(48a) 太郎がまいごをみつけた。

\[
\text{Taro-ga maigo-o mitsuke-ta.}
\]

'SB lost child-OB find[Vt]-Past

'Taro found a lost child.'
This parallels the system of proximate and obviative marking observed in the Algonquian languages. Bloomfield (1962:38, cited in Van Valin 1987:518) describes the system of Algonquian as:

The proximate third person represents the topic of discourse, the person nearest the speaker’s own point of view, or the person earlier spoken of and already known. ... The obviative third person is third person other than the proximate.

We can incorporate the notion of proximate and obviative into the person/animacy hierarchy as follows:²⁸

| Person/animacy Hierarchy: | Human (1 > 2 > 3 Prox > 3 Obvi) > Animate > Inanimate |

Figure 10.3: Person/animacy hierarchy with proximate and obviative systems

Proximate and obviative are lexically marked on the arguments in Algonquian. Although Japanese has a topic marker, there is no such overt marking which denotes the proximate / obviative distinction in Japanese. Nevertheless, I suggest that a similar system underlies the ordering of arguments, in that what is achieved by lexical marking in Algonquian is achieved by the ordering of arguments in Japanese; an argument which precedes another is proximate, and an argument which follows another is obviative. Since a proximate argument is likely to be topical, referential or definite, it has a higher discourse salience than an obviative argument. This ordering, therefore, agrees with the principle of direct alignment.

This ordering condition is also found in Algonquian in addition to marking on the pronominal affix. According to Heath (1976:176), a proximate argument in Algonquian occurs first (leftmost) in the clause. In fact, topicalised elements are widely observed cross-linguistically to typically be placed in initial position (Li and Thompson 1976:465, Dik 1978:145, Shibatani 1978:199, Mallinson and Blake 1981:99).

²⁸ It should be noted that although ‘Proximate > Obviative’ can be either a pronoun or noun in Silverstein’s hierarchy, it is only a noun in the case of Japanese. As discussed in §1.5.1.3, Japanese does not use third person pronoun anaphorically.
The ordering condition is shown in the following set of examples. They demonstrate how discourse salience affects the alignment of arguments, and hence the structure of the sentences, despite the fact that all sentences share the same logical content; 'Taro' is the agent of finding and the other argument *maigo* 'a lost child' is the undergoer.

(48a) 太郎が迷子をみつけた。
    *Taro-ga maigo-o mitsuke-ta.*
    'Taro found a lost child.'

(48b) 迷子を太郎がみつけた。
    ?? *Maigo-o Taro-ga mitsuke-ta.*
    'Taro found a lost child.'

(48c) 迷子が太郎にみつかった。
    (*) *Maigo-ga Taro-ni mitsukat-ta.*
    'A lost child got found by Taro.'

(48d) その迷子が太郎にみつかった。
    *Sono maigo-ga Taro-ni mitsukat-ta.*
    'That lost child got found by Taro.'

(48e) 迷子は太郎にみつかった。
    *Maigo-wa Taro-ni mitsukat-ta.*
    'The lost child got found by Taro.'

(48a) is acceptable, because the first listed argument is a proper noun 'Taro' which has a higher discourse salience for being more definite than the second argument which is an indefinite common noun 'a lost child'.29 As explained earlier, change of the surface order to OS, as in (48b), does not make the sentence acceptable. Conversely, the reversed alignment in (48c) is unacceptable or at least much less preferred (would not be uttered by a native speaker of Japanese). However, when 'a lost child' is definite, as in (48d), or topicalised, as in (48e), it can precede 'Taro'. A topicalised argument is usually definite due to prior mention or because it is known to or identifiable by the addressee. This suggests that the alignment of the sentence is not

---

29 Definiteness is not lexically marked in Japanese, hence this needs clarification. The next subsection specifically examines the effect of definiteness in determining the direction of alignment of otherwise equivalent arguments.
arbitrary but is constrained by the discourse salience, so that an argument with a higher discourse salience is followed by another argument with a lower discourse salience, otherwise the sentence is unacceptable or dispreferred. Accordingly, the sentence has to be structured depending on which argument is expressed as the subject, as seen in the above examples. In other words, sentences in Japanese form a direct alignment in terms of the discourse salience as well as the person/animacy hierarchy, or the sentences are restructured, as we saw in §4.5. Hence, the type of structure of sentences provides information about the relationship between arguments in terms of the discourse salience and the person/animacy hierarchy, and this information is vital for referent identification when arguments are ellipted.

4.7.3 Definiteness

Since Japanese does not have articles and definiteness is not grammaticalised, it is difficult to exactly determine the definiteness of arguments. For instance, the earlier example (48c), which is repeated below, is unacceptable, since 'lost child' is indefinite.

(48c) 迷子が太郎にみつかった。
(*) *Maigo-ga Taro-ni mitsukat-ta.
lost child-SB -Obl find[Vi]-Past
'A lost child got found by Taro.'

In theory, the same sentence could be less unacceptable, if 'lost child' were intended to be definite. However, as will be discussed in §4.10.1, if 'lost child' was intended to be definite, it would be modified by a demonstrative probably for emphasis, or be ellipted if referential. In other words, the 'lost child' above is indeed interpreted as indefinite, and it cannot precede the more definite argument 'Taro'. Hence, definiteness is one factor which determines alignment. Conversely, it may well be that alignment in fact signals definiteness.\textsuperscript{30} This is indeed the case for Chinese, in

\textsuperscript{30} In terms of objects, a related claim regarding the relation between definiteness and word order has been made by Hopper and Thompson (1980:257-267). Cross-linguistically, an indefinite or non-referential object in numerous languages is associated with an intransitive construction, because the object tends to coalesce; manifested in such forms as incorporation or different word order.
that definiteness can be signalled by word order; in general, pre-verbal subjects are
definite and post-verbal subjects are indefinite (Lyons 1999:88).

Definiteness is usually not a clear-cut dichotomous notion. Rather, it is
relative and forms a scalar relation; namely, one argument is more definite than
another argument in a sentence. Definiteness is also determined by the speaker's
assumptions about the addressee's knowledge of the discourse (Du Bois 1980, Givon
1983). Watanabe (1989:135) states the following three criteria for the notion of
definiteness:
1. the generically shared or culturally shared context
2. the deictically shared speech context
3. the contextually shared, i.e. the preceding discourse context

Generally, definiteness for the third person in Japanese is manifested in three
ways listed below (see Silverstein 1976, Comrie 1981, Croft 1990, Hawkins 1991,
Lyons 1999 for definiteness in other languages):

1. type of noun: a kinship term is more definite than a proper name (because a
kinship term usually presupposes the possessor, while a proper name does not
necessarily), a proper name is more definite than social terms/titles, which in
turn is more definite than a common noun; namely:
{More definite <-- kinship > proper name > social term/title > common noun}
2. a referential argument is more definite than a non-referential (often newly
introduced) argument.
3. type of subject marking: the *wa*-marked argument is more definite than
the *ga*-marked argument.

To verify the third manifestation of definiteness, namely the type of subject
marking, I here summarise Watanabe's analysis. She has shown that 99.5% of *wa-
marked arguments are definite (Watanabe 1989:140-1), whereas only 61.6% of *ga-
marked arguments are definite, and, as a reference point, 100% of ellipted arguments
are definite (ibid. 75-154). Looking at the issue of definiteness from another
perspective, 69.9% of definite subjects are marked by *wa* and 30.1% by *ga*, while
1.7% of indefinite subjects are marked by *wa* and 98.3% by *ga*.\(^{31}\) Even though Watanabe did not specify her definition of definiteness in the analysis, these statistical findings still show the differences between *wa* and *ga* clearly.

There is also some interesting research by Yamashita (1996) which supports my claim that a more definite argument will be placed before less definite arguments. This is presented in detail in §4.9 with the discussion of the rigidness of the alignment of arguments in relation to word order.

Also of interest are cases where two third person arguments have the same definiteness value. In such cases, the alignment is not constrained and either alignment is acceptable. For example, both arguments may have no prior mention, and hence possess the same degree of indefiniteness. In such cases, both alignments are equally acceptable. For example, 'A woman found a man' (49a) is as acceptable as 'A man got found by a woman' (49b):

(49a) 女が男をみつけた。
    *Onna-ga otoko-o mitsuke-ta.*
    woman-SB man-OB find[Vt]-Past
    'A woman found a man.'

(49b) 男が女にみつかった。
    *Otoko-ga onna-ni mitsukat-ta.*
    man-SB woman-Obl find[Vi]-Past
    'A man got found by a woman.'

Similarly, in relation to the structure of sentences, in the same situation, there is no constraint as to which structure can be used to convey a given logical content. For example, recall that a transitive structure is used for sentences with direct alignment, as in (50a), and an existential construction is used for inverse alignment in the underlying structure, as in (50b). Both constructions are equally acceptable when two third person arguments have the same definiteness:

(50a) 花子が太郎に電話した。
    *Hanako-ga Taro-ni denwashi-ta.*
    - SB -Alla telephone-Past

---

\(^{31}\) *Ga*-marked arguments are in principle indefinite, unless denoting the exhaustive listing which connotes an emphasis (see Kuno 1973). I suspect that one of the other reasons why 30.1% of definite arguments are marked by *ga* has to do with it appearing in the subordinate clause; the subject in an subordinate clause must be marked by *ga* irrespective of definiteness. I do not have access to Watanabe's corpus to check on this point.
'Hanako called Taro.'

(50b) Existential construction

Hanako-kara Taro-ni denwa-ga at-ta.
-Abl -Alla telephone-SB exist-Past
'There was a call from Hanako to Taro.'

However, when benefactive verbs are used under these circumstances, the sentences do not have such option, and are restricted to the direct form. For example, (51a) with the direct form is acceptable, while (51b) with the inverse form is unacceptable.32 This is because benefactive verbs necessarily place the speaker's empathy on one argument, so that the inverse form in (51b) would place the speaker's empathy towards the subject 'woman', in which case the value of the two arguments are not equal (see §4.10.2).

(51a) Direct

Otoko-ga onna-ni hon-o age-ta.
man-SB woman-IO book-OB give [Direct]-Past
'A man gave a woman a book.'

(51b) Inverse

* Otoko-ga onna-ni hon-o kure-ta.
man-SB woman-IO book-OB give [Inverse]-Past
'A man gave a woman a book.'

It should be noted that the idea of identical discourse salience only exists at the conceptualisation stage. As soon as the idea is expressed as a sentence, the argument which is expressed as the subject receives a higher discourse salience by virtue of the principle of direct alignment which places an argument high in discourse salience on the subject. Kameyama (1998) makes a distinction between 'input salience' (before making the concept into a sentence) and 'output salience' (after a sentence is formed). In the pairs of examples above, two arguments have the same 'input' discourse salience, but have a different 'output' discourse salience. The choice of the subject is important, because it determines output discourse salience which affects the structure of the next sentence (see Chapter 6).

32 An analogous observation was made by Ohso (1976:16) and Kuno (1987).
4.8  Summary of structures and their implications

I have demonstrated so far that argument structures in Japanese are governed by the principle of direct alignment which is characterised by two constraints - the person/animacy hierarchy and discourse salience. When a sentence violates this principle, it is either marked by an inverse verb or needs to be restructured. This principle applies to the alignment of all sentences including intransitive, for example, sentences with directional verbs. However, restructuring is most clearly manifested in transitive sentences. In these cases, the principle may lead to a change in the transitivity of the sentence. The basic sentence structures relating to this principle which have been discussed in this chapter (and which do not represent a exhaustive listing) are summarised as follows:

Table 17: Basic formula of argument structures in Japanese

<table>
<thead>
<tr>
<th>Principle: Direct alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constraint 1: Person/animacy Hierarchy</td>
</tr>
<tr>
<td>Constraint 2: Discourse salience</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transitive sentence</th>
<th>Direct:</th>
<th>Restructuring</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_I O_h V_t</td>
<td>&lt;St^&gt; S_h O_f V_t</td>
<td></td>
</tr>
</tbody>
</table>

Inverse (benefactive verb) <St2.1> S_I O_h V_t[inverse]
Inverse (directional verb): <St2.2> S_I Obl_h Obl_m V_i
                       --> S_I Obl_h Obl_m V_i[inverse]
Inverse (serialised use) <St2.3> S_I O_h V_t+V_i[inverse]
Converse <St3> S_h Obl_m{ni} O_f V_t[converse]

2. De-transitivization: S_I O_h V_t --> V_i
Passive <St4> S_h Obl_{ni} V_t+passive
Intransitive <St5> S_h Obl_{ni} V_i
Low-transitive sentences <St6> Dat/Top_{ni/wa} O_I_{ga} V_i/Adj
Existential <St7> Obl_{ni} Obl_m{kara} S_I^V V_i[existential/inverse]
This table shows that the organisation of argument structure in Japanese is aimed towards forming a direct alignment of arguments in terms of two constraints - the person/animacy hierarchy and discourse salience - so that the subject is higher on the hierarchy and in discourse salience than the object. This is noted by <St1> (Structure 1). When the logical content of a transitive sentence violates this principle, i.e. the subject is lower on the hierarchy and/or in discourse salience than the object, the sentence must make its inverse alignment explicit by using an inverse verb <St2>, or be restructured into a different construction by using a converse construction <St3>, passive construction <St4>, intransitive construction <St5>, or existential construction <St7>. In addition, the actual case markers for some oblique arguments are set out in the table denoted by, for example, {ni}.

Each construction conveys different conversational implicatures. The inverse and converse constructions tend to imply the speaker's benefit and hence gratitude towards the source agent; the passive tends to imply undesirability and adversity; and the intransitive and existential tend to imply spontaneity and focus on the event description rather than on the agent, which is more typical of high transitive sentences.

Table 17 also shows that the common effect of restructuring in these ways is de-transitivization, as transitive sentences are turned into syntactically intransitive sentences while retaining the two core arguments. As demonstrated, this de-transitivization has an effect not only on prototypical transitive sentences, but also on 'low-transitive sentences' <St6>. Low-transitive sentences are semantically transitive, involving two essential arguments similar to actor and undergoer, but syntactically intransitive because there is no accusative-marked argument involved and the morphology of the verb is intransitive. The order of these arguments is rigid, showing direct alignment in terms of the person/animacy hierarchy and discourse salience.
Since, unlike for other constructions, there is no transitive counterpart in low-transitive sentences, I suggested that low-transitive sentences are grammaticalised constructions resulting from the effect of de-transitivization by obeying the principle of direct alignment.

The effect of de-transitivization is also manifested in transitive sentences involving two inanimate arguments, such as 'Wind broke the vase' \(<St8>\). Even though this sentence does not violate the principle in terms of the person/animacy hierarchy, in terms of discourse salience, one is the agent like argument which correlates with a higher discourse salience. However, an inanimate subject is not a prototypical agent, and it is also dispreferred in Japanese, as discussed in §4.1 and §4.6.2. Consequently, such a sentence is restructured and de-transitivized; the agent argument is demoted to oblique, and the patient argument is promoted to nominative. They continue to occupy the same position in the sentence and keep the same order, with the agent argument followed by the patient. This order meets the principle of direct alignment.

Thus, the principle of direct alignment is manifested in all of the argument structures in Table 17. These argument structures specify the number of subcategorised arguments, their case markings, and their functional roles. These pieces of information from the formula provide vital information for detecting the existence of ellipsis and determining the referential identity of the ellipted argument. For example, we know from the morphology of the verb that (51a) has a transitive structure. By referring to the formula, we know that the subject is ellipted, and the subject must be higher than the overt object in terms of the hierarchy and/or discourse salience. Since an inanimate argument cannot normally be expressed as the subject in transitive sentences, it must be animate. On the other hand, (51b) is an intransitive sentence according to its verbal morphology, so that it can be a complete sentence without ellipsis, or by following \(<St8>\) we know that an inanimate agent is ellipted.

(51a) 花瓶をこわした。
    \(Kabin-o~kowashi-ta.\)
    vase-OB broke[Vt]-Past
    'I/we/you/he/she/they ... broke the vase.'
Hence, we can detect the existence of ellipses and narrow down the potential referents of the ellipted arguments from the table with the knowledge that; [1] the verbal morphology shows transitivity, [2] the principle of direct alignment ensures that the subject (dative/topic subject in the case of low-transitive sentences) is higher than the object/oblique with respect to the person/animacy hierarchy and discourse salience, [3] the type of surface structure signals the direct-inverse distinction in the underlying structure, [4] an inanimate argument is not expressed as the subject in transitive sentences.

The Goi taikei (valency) dictionary discussed in §3.1.3 also provides those pieces of information which derive from verbal semantics, and it can provide a lot more extensive information in terms of number of words that it lists and more detailed classification of each NP. However, there is a critical difference between the Goi taikei dictionary and Table 17. That is, Table 17 provides information on the relationship between the arguments in the sentence based on the structure of sentences and the principle of direct alignment. The Goi taikei dictionary cannot supply this information. For example, §4.5.4 presented the following examples, which involve two ellipted arguments of the caller and the receiver of the call. The structure of (52a) is the result of the sentence having direct alignment in the underlying structure, while (52b) is the result of inverse alignment in the underlying structure.

(52a) Direct underlying structure

電話した。

(Watashi-wa Taro-ni) denwashi-ta.

1sg-SB -IO telephone-Past

'(I) called (Taro).'

(52b) Inverse underlying structure

電話があった。

(Taro-kara watashi-ni) denwa-ga at-ta.

-Abl 1sg-Alla telephone-SB exist-Past

'There was a call for me from Taro. -> (Taro) called (me).'
The *Goi taikei* dictionary can only provide the same information for both examples about the two ellipted arguments, namely that they are human or an organisation which represents the people in it. It cannot provide information which can discriminate between the two arguments, so that it cannot distinguish (52a) from (52b). The *Goi taikei* dictionary will not be able to cope with the situation, when there is more than one possible human referent candidate in the context. The principle of direct alignment, on the other hand, can provide information about the relationship of the two arguments from the structure of sentences; the transitive structure of (52a) tells that the subject is higher on the hierarchy and/or discourse salience than the indirect object (i.e. caller is higher than the receiver), and the intransitive structure of (52b) tells the reverse. This information is vitally important for the correct recovery of ellipsis. This is discussed in detail in §5.3.

The formulae are also helpful in capturing another aspect of Japanese grammar, that is, identifying the case role of topic arguments. Since the topic marker *wa* replaces the nominative and the accusative markers (and oblique to a much lesser extent), the case role of *wa*-marked argument needs to be identified. This can be done by referring to the table. For example, using an earlier example (48e) renumbered as (53), by referring to Table 17, (53) matches <St5>, hence the case role of the *wa*-marked argument is identified as the subject.

(53)  迷子は太郎に見つかった。
     *Maigo-*wa Taro-ni mitsukat-ta.
     lost child-Top -Obl find[Vi]-Past
     'The lost child got found by Taro.'

As a final point, the table also illustrates the existence of varying degrees of transitivity understood in terms of the morphology of the verbs and the type of arguments that the constructions take. That is to say, the list of constructions shows a descending order of transitivity with <St8> being the least transitive. <St2.2> is a construction using directional verbs, i.e. syntactically intransitive, and is roughly placed on a par with <St5> intransitive constructions. This is illustrated below:

| More transitive | St1/St2.1/St2.3/St3 > St4 > St2.2/St5 > St6 > St7 > St8 | More intransitive |

**Figure 17.1: Transitivity of structures**
The degree of transitivity offers important information about ellipsis, in that it correlates with the degree of ellipsis permissibility; the more transitive a sentence is, the more likely it is that the arguments, particularly the higher argument, are ellipted. §5.1 considers this issue.

4.9 Rigidity of the alignment of arguments

In this section, I consider how rigid the principle of direct alignment is. Also I elaborate on the discussion in §4.4 regarding the relation between the alignment of arguments and word order.

As mentioned in §4.4, it is the predominant view in the literature that the order of arguments in Japanese is relatively flexible (e.g. Makino & Tsutsui 1986, Shibatani 1990, Kuroda 1992, Tohsaku 1994, Kameyama 1995), namely SO is the basic argument order but OS is also acceptable. This claim about the flexibility of argument order may theoretically be a valid statement in view of the fact that the use of case markers distinguishes the case role of arguments so that the argument order can be flexible. However, the potential for alternative ordering is not exploited to a great extent in actual texts. In other words, the order of arguments is in fact fairly rigid. In this section, I verify this claim statistically.

First, let us observe sentences with the OS order to see whether or not word order is flexible. The examples presented here are related to earlier examples with SO word order which were totally acceptable. However, they are now presented with OS word order. The observation here is made on the structures listed in Table 17, which are not restricted to the prototypical transitive sentences with two core arguments.

(54) = (2a) (OS) Marked implicature

\[ ? \text{Taro} \text{-OB} \text{ watashi-wa mitsuke-ta.} \]

Taro-OB 1sg-Top find-Past

'It is Taro (not someone else) whom I found.'

(55) = (3a) (OS) Marked implicature

\[ ? \text{Anata-ni watashi-wa hon-o age-ta.} \]

2sg-IO 1sg-Top book-OB give-Past
"It is you (not someone else) to whom I gave the book."

(56) = (15b) (Obl+S) Highly marked implicature
車に私ははねられた。
?? Kuruma-ni watashi-wa hane-rare-ta.
-Obl 1sg-Top run over-Pass-Past
'It was a car (not a bus) which I was run over by.'

(57) = (25) (NomO+TopSB) Unacceptable
英語が太郎はわかる。
* Eigo-ga Taro-wa wakaru.
English-NomOB Taro-Top understand
'It is English that Taro understands.'

(58) = (24) (NomO+DatSB) Unacceptable
子どもが私にいる。
* Kodomo-ga watashi-ni iru.
child-NomOB 1sg-DatSB exist
'It is a child that I have.'

The above examples show that the OS order is highly marked and often unacceptable, in contrast to the fully acceptable SO counterparts. This accords with my claim that the order of arguments (including oblique arguments) must be direct, hence the order is fairly rigid. Thus, as mentioned earlier, direct alignment is enforced not only in terms of underlying structure which may cause a restructuring, but also surface structure.

My analysis shows that the order of arguments in Japanese is statistically fairly rigid. It is based on six texts (from PHP and 'Japanese Society', see §4.6); 113 transitive sentences are found in the texts, and only one of the 113 sentences showed the OS order.33 Hinds (1983), Yamashita & Suzuki (1995) and Miyagawa (1996) also claim that so-called scrambling, i.e. OS order is infrequent. According to Yamashita & Suzuki (1995, quoted in Yamashita 1996), OS occurred in less than 1% of sentences in a colloquial text, which is consistent with my finding. Hinds' studies show a similar result, in that 1.4% (8 out of 567 clauses) in the folk tale of Momotaro had the OS order. This suggests the importance of distinguishing between what is grammatically plausible and what people actually say.

33 The example with OS order is presented in §4.10.1.
OS order is mostly triggered by focus, which can be presenting contrastive or new/important information. When the object is focused, it tends to be preposed to the initial position before the subject. The issue of focus is elaborated in §4.10.1. Apart from this, OS order is rare, and I suggest the following two reasons for the infrequent exploitation of word order flexibility. Firstly, arguments are frequently ellipted. When an argument is implicit, we cannot tell whether the underlying alignment of arguments is SO or OS. Secondly, the infrequent occurrence of OS order is the result of following the principle of direct alignment. As shown above and in §4.4, when the underlying structure of sentences shows inverse alignment, mere mechanical restructuring into OS order, which superficially shows a direct alignment, does not solve the unacceptability of sentences, hence the OS order tends not to occur as a resolution for violations of the principle. Instead, as we have seen, those sentences with inverse alignment are restructured into intransitive sentences or converse constructions to form a direct alignment, unless they are marked by the inverse. Even though these de-transitivized sentences retain two arguments, their case markings are different and the object is no longer retained, hence they cannot form OS order and will not be accounted for in the above analyses. Since restructuring is the preferred means of resolving the violation of the principle, it makes the flexibility of having OS order superfluous. Hence, it is less frequently realised.

There is research by Yamashita (1996) which supports the importance of the principle of direct alignment. She conducted an experiment from the perspective of language processing to examine how word order and case marking in Japanese affect the amount of time taken to read or process a sentence. The result was that the canonical order SO is processed faster than when the same sentence is scrambled to OS. Here, SO forms a direct alignment, whereas OS forms an inverse alignment. The OS order was deliberately formed for comparison in the experiment. This result suggests that when a sentence follows the principle of direct alignment, it is processed faster.

What is interesting in Yamashita's research (1996) is that although OS order is very infrequent in actual texts, when OS order appears naturally in texts, she found no
evidence of processing cost associated with scrambling, i.e. it does not take extra time to process the meaning of an OS sentence compared with its counterpart of SO order which was deliberately formed for comparison.

In actual fact, I found in her figures that the scrambled order takes slightly less processing time than the corresponding canonical ordering; namely, naturally occurring examples of OS are processed slightly faster than their counterpart of SO. Why is this so? When I examined the content of the arguments used in her experiment, the discourse salience of the arguments is slightly different. I hypothesise that this has affected the processing time; a faster reading time was achieved when the sentence formed a direct alignment with respect to discourse salience, i.e. an argument higher in discourse salience precedes another that is lower. Both arguments used in Yamashita's experiment were third person: an indefinite human subject ('a cute girl', i.e. common noun) and another indefinite human object ('a young teacher', i.e. social/occupational noun). She deliberately chose these arguments to be similar, so that the impact from the differences in argument can be minimised, since her interest is about investigating the correlation between word order and case marking with respect to the processing time. Although the arguments do not differ significantly in terms of discourse salience, as shown in §4.7.3, a common noun is nonetheless less definite than a social/occupational noun. In addition, 'cute' is subjective, while 'young' is more identifiable than 'cute', hence 'cute' is probably slightly less indefinite. This slight difference was still reflected in her results, in that the canonical SO order (i.e. 'a cute girl' is followed by 'a young teacher'), which has an inverse alignment with respect to definiteness, was processed slightly slower (the mean response time 594 msec) than the non-canonical OS order showing direct alignment (the mean response time 576 msec). Again, this suggests that it is the principle of direct alignment that determines the processing time, rather than word order, i.e. SO or OS. In other words, what makes the processing of sentences easy or difficult is not entirely a matter of word order and case marking, but fundamentally a matter of whether or not a sentence conforms to direct alignment.
Speed of processing, i.e. easy recognition, is an added motivation to keep direct alignment fairly rigidly.

4.10 Overriding elements for Principle of direct alignment

We have seen that arguments in Japanese are projected so as to form a direct alignment in terms of the person/animacy hierarchy and discourse salience, and that the solution for sentences violating this principle is to restructure them to keep a direct alignment. This alignment is fairly rigid. However, if we are to capture a full picture of argument structure in Japanese, we cannot dismiss the fact that some sentences do violate the principle of direct alignment, yet do not go through a restructuring, and some OS ordered sentences do occur. This suggests that there are some factors which can exempt sentences from following the principle. The investigation of these overriding elements is the topic for this section.

4.10.1 Focus

We saw in §4.9 that though the direct alignment is fairly rigid, OS order does occur infrequently (at less than 1%). Furthermore, the OS order is usually not the result of forming direct alignment. As we saw in §4.4, the unacceptable sentences which violate the principle of direct alignment are still unacceptable when they are in OS order, even though they superficially show a direct alignment. Some of the examples are repeated below:

(59) = (2b) [1 -> 3] (OS)
私を太郎がみつけた。
Watashi-o Taro-ga mitsuke-ta.
1sg-OB Taro-SB find-Past
'Taro found me.'

(60) = (~4b) [3 -> IA] (OS)
太郎が車がひいた。
Taro-o kuruma-ga hii-ta.
-OB car-SB run over-Past
'A car ran over Taro.'

(61) = (~48b) [3 (definite) -> 3 (indefinite)] (OS)
太郎に迷子がみつかった。
Taro-ni maigo-ga mitsukat-ta.
Some may think that the OS order such as the above do occur and that the sentences seem relatively acceptable. This may seem true if these sentences are presented in isolation and without context. Furthermore, as will be discussed in §4.10.5, when all the arguments are overt, such sentences seem acceptable. However, only one example of this type (62) was found in my corpus (PHP 8.1993) discussed in §4.9. I managed to find another example (63) of OS order from another article in PHP (2.1999). The actual examples are as follows:

(62) [IA -> 1] (OS)

この絵は私が描いた。

Kono e-wa watashi-ga kai-ta.

'This picture is what I drew.'

(63) [IA -> 1] (OS)

うれしかったくせに、その返事を私は出せなかった。

Ureshikat-ta kuseni, sono henji-o watashi-wa da-se-nakat-ta.

'happy-Past despite, that reply-OB 1sg-Top send-can-Neg-
Past

'Although (I) was happy (about it), I couldn't send a reply (to that).'

In both of these examples, the inanimate object is preposed and precedes the human subject. These sentences in fact form an inverse alignment, in spite of the fact that their canonical SO has a direct alignment and that the sentences are perfectly acceptable. This inverse alignment is triggered by focus on the object.

Focus in Japanese is often linguistically identifiable. Focused arguments are often fronted, stressed, marked by the topic marker (indicating a contrast) replacing the object marker, as in (62), and very often modified by a demonstrative, as in (62) and (63). These and other strategies induce an increase in the specificity and definiteness of the fronted argument. This leads to the effect that the fronted argument is highly focused in meaning. When the subject is focused, there is no change in word order, as the basic word order is SO anyway. For this reason, the nominative marker ga is frequently used instead of wa to denote focus, but word order does not change. On the other hand, when the object is focused, this is where
the change of word order to OS occurs, and it results in violation of the principle of direct alignment.

4.10.2 Empathy

Empathy is the speaker's viewpoint and 'camera angle' (Kuno & Kaburaki 1977, Kuno 1987, §3.2.1.1). The speaker can describe an event in a number of ways, depending on whose viewpoint is taken. Speakers can express an event through their own view or someone else's. This can affect the structure of sentences and the choice of anaphoric expressions (e.g. pronoun versus reflexive pronoun), as discussed in §2.4.1. §3.4.6 also demonstrated that empathy has a bearing on the use of epistemic morphemes. When empathy is placed on a non-first person, the first person is de-empathised, so that the predicate can be marked with non-first person epistemic morphemes.

Although empathy is most commonly associated with first person, and, as discussed in §3.2.1.1, with in-group members, it can be placed on any human argument which the speaker chooses. When an argument is empathised with, it is treated as first person, regardless of the actual person of the argument. In other words, the actual/surface hierarchical value of that argument is outranked by the speaker's empathy, so that empathy rather than actual person plays a crucial role in determining the position of the arguments on the hierarchy. This induces inverse alignment on the surface. (64) is such an example where empathy is placed not on the speaker, but on the non-first person, whereby its alignment is inverse in terms of the person/animacy hierarchy.

(64) [empathised (3) 1-> non-empathised (1)3]

一人が、私を見るなり、こう言った。
Hitori-ga,  watashi-o miru nari         koo it-ta.
‘One person said this, as soon as he saw me.’

In addition, the subject seems focused. Watanabe (1989:130) states that the use of a noun-classifier, such as, *hitori-ga* in this case, is one of three common devices of coding thematically important indefinite referents in Japanese. There is another
reason why such sentences with inverse alignment are allowed. This is discussed in §4.10.5.

4.10.3 Difference between arguments

The difference between the arguments in terms of the person/animacy hierarchy and discourse salience has an effect on the acceptability of sentences. When this difference between the arguments is small, an inverse alignment of arguments is less unacceptable.\(^{34}\) Acceptability of sentences is gradient, in that the acceptability of inverse alignment of arguments increases as the difference between the two arguments decreases. For example, although all the examples below show inverse alignment, in terms of the person/animacy hierarchy, (65) [2->1] and (66) [3->2] are not as bad as (67) [3->1] and (68) [IA->3], (67) and (68) in turn are not as bad as (69) [IA->1]. Similarly in terms of discourse salience, (70) [Indefinite common noun -> social term] is not as bad as (71) [Indefinite common noun -> proper name].

(65) [2->1] (second person acting on first person)
あなたが私をみつけた。
(?\) Anata-ga watashi-o mitsuke-ta.
2sg-SB 1sg-OB find [Vt]-Past
'You found me.'

(66) [3->2] (third person acting on second person)
太郎があなたをみつけた。
(?\) Taro-ga anata-o mitsuke-ta.
Taro-SB 2sg-OB find [Vt]-Past
'Taro found you.'

(67) [3->1] (third person acting on first person)
太郎が私をみつけた。
? Taro-ga watashi-o mitsuke-ta.
Taro-SB 1sg-OB find [Vt]-Past
'Taro found me.'

(68) [IA -> 3] (Inanimate acting on third person)
車が太郎をはねた。
? Kuruma-ga Taro-o hane-ta.
car-SB -OB run over [Vt]-Past
'A car ran over Taro.'

(69) [IA -> 1] (Inanimate acting on first person)

\(^{34}\) Tsunoda (1991:46) expresses an analogous idea, though he does not use 'inverse'.
車が私をはねた。
* Kuruma-ga watashi-o hane-ta.
car-SB 1sg-OB run over [Vt]-Past
'A car ran over me.'

(70)  [Indefinite common noun -> social term]
男が先生をみつけた。
? Otoko-ga sensei-o mitsuke-ta.
man-SB teacher-OB find-Past
'A man found the teacher.'

(71)  [Indefinite common noun -> proper name]
男が太郎をみつけた。
?? Otoko-ga Taro-o mitsuke-ta.
man-SB -OB find-Past
'A man found Taro.'

Analogously, the integrated value of the person/animacy hierarchy and discourse salience affects the acceptability of sentences. As discussed in §4.7, an argument higher on the person/animacy hierarchy also tends to carry high discourse salience, hence the integrated value is high, whereas an argument low on the hierarchy tends not to be high on discourse salience. There is this correlation, as follows. When a sentence has two arguments, and if the higher argument in the sentence is relatively low on the hierarchy and does not carry a high discourse salience, the strictness of the principle of direct alignment is lessened and the sentence with inverse alignment becomes less unacceptable. The following examples show that (72a) with inverse alignment is less acceptable than (72b) with direct alignment, but (72a) does not sound overly bad.

(72a)  [IA (indefinite) -> 3 (indefinite)]
車が男をはねた。
? Kuruma-ga otoko-o hane-ta.
car-SB man-OB run over [Vt]-Past
'A car ran over a man.'

(72b)  [3 (indefinite) -> IA (indefinite)]
男が車にはねられた。
Otoko-ga kuruma-ni hane-rare-ta.
man-SB car-Obl run over [Vt]-Passive-Past
'A man was run over by a car.'

The reason for this situation is that the higher argument in these examples is relatively low both in terms of the hierarchical value and discourse salience, i.e. the higher argument is an indefinite third person common noun. When the inanimate subject is
marked by the topic marker, the sentence is perfectly acceptable, because the
discourse salience of the subject is a lot higher than the indefinite human argument,
despite the fact that in terms of the hierarchy, human is higher than inanimate.

(72c) [IA (topicalised) -> 3 (indefinite)]
車は男をはねた。
*Kuruma-wa otoko-o hane-ta.*
  car-Top man-OB run over [Vt]-Past
'The car ran over a man.'

4.10.4 Type of verbs

Verbal semantics also have an effect on the acceptability of sentences with an
inverse alignment. Verbs that are benefactive impose an absolute requirement that
the sentence follow direct alignment, but with some other verbs a violation of the
principle of direct alignment does not seem as unacceptable. For instance, all the
examples below show inverse alignment - third person is acting on first person.
However, when an action verb is used as in (73), and certain other verbs as in (74),
the sentence is totally acceptable, and (75) using a non-benefactive verb can be
acceptable, while (76) using a benefactive verb is not acceptable under any
circumstances:

(73) 太郎が私をぶった。
*Taro-ga watashi-o but-ta.*
Taro-SB 1sg-OB hit-Past
'Taro hit me.'

(74) 太郎は私に言った。
*Taro-wa watashi-ni it-ta.*
-Top 1sg-Obl say-Past
'Taro said (to me).'  

(75) 太郎が私をみつけた。
*? Taro-ga watashi-o mitsuke-ta.*  
Taro-SB 1sg-OB find [Vt]-Past
'Taro found me.'

(76) 太郎が私にあげた。
*Taro-ga watashi-ni age-ta.*  
-SB 1sg-IO give[Direct]-Past
'Taro gave (it) to me.'

This difference in the acceptability here may be due to the fact that in (73) and (74),
sentences express accusation and the like which require explicit information about
who the patient and agent are, so that they tend not to elide arguments. Also, these sentences tend to be uttered by the speaker, when he is a victim or beneficiary, hence expressed as non-subject, i.e. inverse alignment. In terms of (76), benefactive verbs have a pair of forms which clearly distinguish the direct/inverse oppositions, so that they are more sensitive to the direction of alignment which cannot be violated. As I will show in the next subsection, when arguments are overt, sentences with inverse alignment seem to be less unacceptable. This also explains (75).

4.10.5 Overt arguments

The preceding sections have shown four situations where a violation of the principle of direct alignment can be tolerated. Notice, though, that violations occur only when arguments are overt. When all arguments in a sentence are overt, the alignment of the arguments seems to be less constrained by the principle of direct alignment. Some native speakers of Japanese may have found the sentences which are rated unacceptable in this thesis rather acceptable. There are two reasons for this. One, as explained in §3.2.1.4, is that inverse alignment appears in subordinate clauses (particularly in relative clauses), which may give rise to the wrong impression that it is also acceptable in matrix clauses. The other is that when all arguments are overt, the proposition of the sentence is unambiguous, so that semantically the sentence seems acceptable, even though it is syntactically or stylistically infelicitous. Addressees in normal circumstances tend to focus their attention on comprehending the meaning of sentences, rather than paying attention to the grammaticality of sentences, unless the sentence is severely ungrammatical, in which case it is often incomprehensible.35

4.11 Strict principle enforcement on sentences with ellipsis

The most important observation for this thesis, however, is that when one or more arguments are ellipted, the interpretation of arguments is always based on direct alignment, as set out in §3.2.1.4. For instance, the earlier example (75) is stylistically

35 For this reason, as many have pointed out, when sentences are presented without context, forming grammaticality judgements of sentences is a very artificial human activity.
infelicitous, unless Taro is focused as in an answer to a wh-question. However, when we see it on its own, it seems acceptable. When the object is ellipted, however, the sentence can never be interpreted as having first person object, i.e. the interpretation of inverse alignment is not possible, except as an answer to a wh-question. The identity of the ellipted object will be interpreted as lower than the overt subject in terms of the person/animacy hierarchy and discourse salience, so that it can only be a third person with lower discourse salience than Taro, or inanimate argument, as shown in the translation in (75a):

(75) 太郎が私をみつけた。
   ?Taro-ga watashi-o mitsuke-ta.
   Taro-SB 1sg-OB find [Vt]-Past
   'Taro found me.'

(75a) 太郎がみつけた。
   Taro-ga ø mitsuke-ta.
   Taro-SB OB find [Vt]-Past
   'Taro found (*me/a man/it).'

Similarly, (77a) with inverse alignment is awkward. Even if (77a) was accepted by some speakers, when the indirect object is ellipted (77b), it cannot be interpreted as first person. The sentence is interpreted as having a direct alignment.

(77a) 太郎が私に手紙を書いた。
   ?Taro-ga watashi-ni tegami-o kai-ta.
   Taro-SB 1sg-IO letter-OB write-Past
   'Taro wrote a letter to me.'

(77b) 太郎が手紙を書いた。
   Taro-ga ø tegami-o kai-ta.
   Taro-SB OB letter-OB write-Past
   'Taro wrote a letter to (*me/someone).'

4.12 Summary

Japanese sentences are generally structured to conform to the principle of direct alignment. This alignment is rigid. A limited degree of inverse alignment is tolerated when arguments are overt, provided that the difference in integrated value of arguments is small, or when an argument is focused or empathised with. When arguments are ellipted, however, the interpretation of the sentences is always on the basis of direct alignment. The relationship between argument structure and ellipsis is
further examined in the next chapter which elucidates the mechanisms of argument ellipsis.
Chapter 5  *Sentence devices II*:  
*Principles of Argument Ellipsis*

In this chapter, I relate the findings on argument structure discussed in Chapter 4 to the mechanisms of argument ellipsis. I propose a principle governing ellipsis which involves the principle of direct alignment and constraints on argument structure. Then I show how this principle captures the behaviour of ellipsis in Japanese and can be used to narrow down the referential identification of argument ellipsis.

5.1  **Argument structure and ellipsis**

Before proposing the principle of ellipsis in §5.2, first I list some of the examples used in Chapter 4 to illustrate the patterning of ellipsis. In these examples, I posit a situation where a sentence has two or more underlying arguments, one of which is ellipted. This is given first in order to demonstrate which argument in the sentence in isolation is most prone to ellipsis and to illustrate the factors that induce ellipsis. The choice for ellipsis given below is based on native speakers’ intuition from eight informants. Among these eight, there was no dispute about the choice of argument for ellipsis, which indicates that ellipsis is controlled by regular principles. Four such factors are considered. §5.1.1 illustrates the implications of the type of marker attached to subjects, namely, the choice between the topic marker *wa* and the nominative marker *ga*. §5.1.2 discusses hierarchical effects, §5.1.3 transitivity effects, and §5.1.4 discourse salience effects. Then, in §5.2, I introduce the principle of ellipsis. §5.3 will show how this principle determines the referential identity of ellipted arguments.

In real texts, however, ellipsis is not limited to one argument per sentence; any argument and even all arguments can be ellipted. Such multiple ellipses are dealt with in §5.4. The examples used up to that point will be simple sentences. Complex sentences are examined in §5.5.
5.1.1 The subject markers

Subjects in Japanese are, as mentioned in §2.5.1.2, predominantly marked by *wa* or *ga*. The choice of subject marker has an enormous bearing on ellipsis permissibility. Observe the following minimal pairs of sentences which show that *wa*-marked subjects, as in (1a), (2a) and (3a), can be ellipted, indicated by brackets, while *ga*-marked subjects, as in (1b), (2b) and (3b), cannot:  

\[1\]

<table>
<thead>
<tr>
<th>1a</th>
<th>(太郎は)バスにはねられた。</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Taro-wa) basu-ni hane-rare-ta.</td>
<td>(Taro) was run over by the bus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1b</th>
<th>(太郎が)バスにはねられた。</th>
</tr>
</thead>
<tbody>
<tr>
<td>* (Taro-ga) basu-ni hane-rare-ta.</td>
<td>* It was (Taro) who was run over by the bus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2a</th>
<th>(私は)太郎に電話をした。</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Watashi-wa) Taro-ni denwa-o shi-ta.</td>
<td>(I) called Taro.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2b</th>
<th>(私が)太郎に電話をした。</th>
</tr>
</thead>
<tbody>
<tr>
<td>* (Watashi-ga) Taro-ni denwa-o shi-ta.</td>
<td>* It was (I) who called Taro.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3a</th>
<th>(太郎が)迷子をみつけた。</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Taro-wa) maigo-o mitsuke-ta.</td>
<td>(Taro) found a lost child.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3b</th>
<th>(太郎が)迷子をみつけた。</th>
</tr>
</thead>
<tbody>
<tr>
<td>* (Taro-ga) maigo-o mitsuke-ta.</td>
<td>* It was (Taro) who found a lost child.</td>
</tr>
</tbody>
</table>

We can identify two interrelated factors associated with the difference in marker which are responsible for the above difference in ellipsis permissibility. One is attributed to the fact that, as mentioned in §2.5.1.2, §3.5.2, §4.7.3, *wa*-marked

---

1 The translations for (1b), (2b) and (3b) are reached where the *ga*-marked subjects are stressed, and represent that the subjects are focused in meaning. They are given to contrast with the counter examples of (a)s, but they do not necessarily have focused meanings all the time.
subjects, as topic, generally represent old and definite information.\(^2\) They are identifiable without recourse to overt expression, hence they can be ellipted.\(^3\) On the other hand, \textit{ga}-marked subjects generally represent new information and focus (§4.10.1) which are harder or impossible to retrieve without overt mention, and hence they cannot be ellipted.\(^4\)

Another factor is related to the person/animacy hierarchy and discourse salience. §4.7.1 explained that an argument higher on the person/animacy hierarchy and in discourse salience tends to use \textit{wa} as the unmarked subject marker, while an argument lower on the person/animacy hierarchy and in discourse salience uses \textit{ga} as the unmarked subject marker. The above examples illustrate how this association of \textit{wa} with arguments high in animacy and discourse salience contributes to ellipsis. In other words, the person/animacy hierarchy and discourse salience determine the type of subject markers, and these subject markers then affect ellipsis permissibility.

One might ask how, when an argument is ellipted, it is possible to tell whether the underlying marker is \textit{wa} or \textit{ga}. This is a legitimate concern. The above claim is supported by the fact that when the \textit{ga}-subjects in (1b) and (2b) are ellipted, the sentences cannot be interpreted as such. Instead, ellipted arguments are interpreted as having \textit{wa}-marking. On the other hand, when the \textit{wa}-subjects in (1a), (2a) and (3a) are ellipted, the sentences do correspond to the given interpretations. Kuno (1978:50) has also claimed that \textit{ga}-marked matrix subjects cannot be deleted, and that deleted subjects all have \textit{wa}-marking in underlying structure.

Analogously, in the low-transitive sentences discussed in §4.6.1, subject arguments can be marked either by \textit{wa} or \textit{ni}. The following sentences show that the \textit{wa}-marked arguments can be ellipted, while the \textit{ni}-marked arguments are difficult to elide, if not impossible:

\(^2\) \textit{Wa} may also have a contrastive function. When it has this latter function, it is focused and \textit{wa}-marked subjects cannot be ellipted.

\(^3\) Furthermore, topic can be either establishing a topic (i.e. first mention) or carried over. When a topic is being established, it has no prior mention and is harder to elide. See §6.1.

\(^4\) As seen in §3.5.2, \textit{ga}-marked arguments can be ellipted in subordinate clauses. In fact, they must be ellipted, when they are coreferential with the matrix subject.
(4) (私は)頭が痛い。
   (Watashi-wa) atama-ga itai.
   1sg-Top head-NomOB sore
   '(I) have a headache.'

(5) (太郎は)考え方が古い。
   * (Taro-wa) kangaekata-ga furui.
   -Top thinking-NomOB old [Adj]
   '(Taro) has an old-fashioned idea.'

(6a) (私は)子どもがいる。
   (Watashi-wa) kodomo-ga iru.
   1sg-Top child-NomOB exist
   '(I) have a child.'

(6b) (私に)子どもがいる。
   * (Watashi-ni) kodomo-ga iru.
   1sg-DatSB child-NomOB exist
   '(I) have a child.'

(7) (太郎に)山が見えた。
   * (Taro-ni) yama-ga mi e ta.
   Taro-DatSB mountain-NomOB see can Past
   '(Taro) could see the mountain.'

The difference between  
and  
is most clearly seen in the pair of sentences (6a) and (6b). In (6a), the ellapsed subject can be ellapsed if it is an established topic. (6b), on the other hand, is new information, hence cannot be ellapsed.

When  
-marked arguments are ellapsed, a different interpretation is possible. Since the structures of some of these sentences are identical to intransitive sentences and the nominative object can be seen as the subject, they can be taken as canonical intransitive sentences with no ellipsis. For example, in (6b), when the dative subject is ellapsed, it is more easily interpreted as an existential sentence, such as 'There is a child (playing in the park).'

(7), on the other hand, is different from (6b), in that the verbal semantics requires a human argument, so it cannot be taken as an intransitive sentence with no ellipsis.

It is important to note that the reason why  
-marked subjects cannot be ellapsed is not because of the argument type per se, but because of the  
-marking. For this reason, in the examples to follow, all human subjects are marked by the topic marker  
, allowing us to observe what other factors govern the mechanisms of ellipsis. This  
-marking, however, does not necessarily license ellipsis, nor
represent the argument which is most prone to ellipsis. For example, the wa-marked
subject in (8) can be ellipted, but it is not the argument most prone to ellipsis, which
in this case is the indirect object.

(8) 太郎は(私に)電話をしてきた。
    Taro-wa (watashi-ni) denwa-o shite-ki-ta.
        -Top  1sg-IO  telephone-OB  do-come[Inverse]-Past
    'Taro called (me).'

Thus, topic marking of the subject is only one factor which governs ellipsis
permissibility. Other factors are examined in the following subsections.

5.1.2 Hierarchical effects

In this subsection, I investigate what effects the person/animacy hierarchy has
on ellipsis. Let us observe some sentences, each of which has one ellipted argument
indicated by brackets. As mentioned earlier, the choice of ellipsis in these sentences
was made by eight native speaker informants.

(9) (私は)太郎に本をあげた。
    (Watashi-wa)     Taro-ni    hon-o     age-ta.
        1sg-Top           Taro-IO  book-OB  give [Direct]-Past
    '(I) gave a book to Taro.'

(10) 太郎は(私に)本をくれた。
    Taro-wa   (watashi-ni)    hon-o      kure-ta.
        -Top      1sg-IO  book-OB  give [Inverse]-Past
    'Taro gave a book (to me).'

(11) (私は)太郎に電話をした。
    (Watashi-wa)  Taro-ni      denwa-o     shi-ta.
        1sg-Top      -IO    telephone-OB  do-Past
    '(I) called Taro.'

(12) 太郎は(私に)電話をしてきた。
    Taro-wa  (watashi-ni)  denwa-o   shite-ki-ta.
        1sg-IO  telephone-OB  do-come[Inverse]-Past
    'Taro called (me).'

(13) (あなたに)太郎から電話があった。
    Anata-ni  Taro-kara      denwa-ga       at-ta.
        2sg-Obl   -from  telephone-SB  exist-Past
    'There was a call (for you) from Taro.'

(14) (太郎は)バスにはねられた。
    (Taro-wa)    basu-ni      hane-rare-ta.
        bus-Obl    run over-Pass-Past
    '(Taro) was run over by the bus.'
The examples clearly show that it is the arguments higher on the hierarchy that are ellipted. These ellipted arguments are the first argument in the sentence and subject, except when the inverse alignment is marked, as in (10) and (12), in which case the ellipted arguments are neither the subject nor in initial position. That the higher argument is usually the subject is a natural consequence of the principle of direct alignment, therefore in turn proves that the principle is correct.

Further evidence for the claim that the higher argument is more prone to ellipsis is given in the following examples. This time lower arguments are deliberately ellipted instead:

(15) 私は雨にぬれた。
(Watashi-wa) ame-ni nure-ta.
'I got wet by the rain.'

(9)' 私は（太郎に）本をあげた。
Watashi-wa (Taro-ni) hon-o age-ta.
'I gave a book (to Taro).' 

(9)'' 私は太郎に（本を）あげた。
Watashi-wa Taro-ni (hon-o) age-ta.
'I gave (a book) to Taro.'

(10)' （太郎は）私に本をくれた。
(Taro-wa) watashi-ni hon-o kure-ta.
'(Taro) gave me a book.'

(11)' 私は（太郎に）電話をした。
Watashi-wa (Taro-ni) denwa-o si-ta.
'I called (Taro).' 

(12)' （太郎は）私に電話をしてきた。
(Taro-wa) watashi-ni denwa-o site-ki-ta.
'(Taro) called me.'

(13)' あなたに（太郎から）電話があった。

---

5 This agrees with the cross-linguistic trend that the higher in animacy the transitive subject, the less it is marked (i.e. zero morpheme), while the higher in animacy the transitive object, the more it is marked (i.e. overt morpheme) (Croft 1990:138).
There was a call for you (from Taro).

'There was a call for you (from Taro).'

There was (a call) for you from Taro.

'There was (a call) for you from Taro.'

Taro was run over (by the bus).

'Taro was run over (by the bus).' 

I got wet (by the rain).

'I got wet (by the rain).'

Such sentences sound incomplete, and native speakers will have a strong feeling that an argument is missing, requiring inference and context to retrieve the referents of the ellipted arguments. On the other hand, in the earlier set of examples the ellipted arguments sound unmarked, are understood and easily retrieved.

In fact, the overt expression of understood arguments in such sentences gives rise to special implicatures, such as emphasis and contrast (see §1.7.1, 'flouting of the maxim of quantity' Grice 1975, also see §6.2). For example, first person and second person, i.e. speech act participants, are not anaphoric, but deictic. They do not require antecedents, and they are generally treated as given information (Chafe 1976:31-32), so ellipting first person and second person is unmarked. As discussed earlier, the unmarked referent of ellipsis in declaratives is understood as first person and in interrogatives it is second person. If they are not ellipted, they sound highly marked.

---

6 When the oblique marked agent is unimportant or unspecific, an agentless passive is acceptable. For example, 'This car is made in Japan (by ... ).' For this reason, (14)' is less unacceptable than other examples.

7 In natural language, such undercoded sentences do occur occasionally. §7.2.3 will explain how to retrieve referents of such undercoded sentences.

8 Except when there is ambiguity. For example, first person in (6b) is hard to elide. I suspect this is because without overt expression of the argument the sentence can look like intransitive whereby no argument is ellipted. However, if it is marked by wa and has a topic in the context, it can be ellipted, because it means that the argument is coreferential with the topic.
The same trend is observed in low-transitive sentences, in that a higher argument, rather than the nominative marked object, is more prone to ellipsis.

(16) (私に)子どもができる。
    ? (Watashi-ni) kodomo-ga dekiru.
    1sg-DatSB  child-NomOB  can
    'I am expecting a baby.'

(16)' 私に (子どもが)できる。
    * Watashi-ni (kodomo-ga) dekiru.
    1sg-DatSB  child-NomOB  can
    'I am expecting (a baby).'

(17) (太郎は)英語がわかる。
    ? (Taro-wa) eigo-ga wakaru.
    Taro-Top  English-NomOB  understand
    '(Taro) understands English.'

(17)' 太郎は (英語が)わかる。
    ?? Taro-wa (eigo-ga) wakaru.
    Taro-Top  English-NomOB  understand
    'Taro understands (English).'

(18) (あなたは)考え方が古い。
    ? (Anata-wa) kangaekata-ga furui.
    2sg -Top  thinking-NomOB  old [Adj]
    '(You) have an old(-fashioned idea).' 

(18)' あなたは (考え方が)古い。
    ? Anata-wa (kangaekata-ga) furui.
    2sg -Top  thinking-NomOB  old [Adj]
    'You have an old(-fashioned idea).'</n
Here, however, we find some differences from the earlier set of examples. Although the higher argument is more prone to ellipsis than the lower argument, it is nonetheless harder to elide the higher argument in low-transitive sentences than in the earlier set of sentences. When the higher argument is ellipted, even if it was first person, which has the highest value of person and discourse salience, as in (16), the sentence sounds somewhat more incomplete than the earlier set of sentences. Native speakers have the sense that an argument which should have been there is missing.\(^9\) Even though the verbal semantics signal that there is a missing human actor in (17) and (18) and the context may provide the referential identity of the ellipted

\(^9\) (18)' is little less unacceptable than the comparable examples. I suspect this is because the sentence is conventionalised as an expression, so that the missing argument is understood.
arguments, the sentences still sound less complete than the earlier set of examples. Thus, low-transitive sentences tend to require that both arguments be overt.

It is even harder to elide the arguments in constructions with inanimate arguments discussed in §4.6.2:

(19) (風で)花瓶がこわれた。

? (Kaze-de) kabin-ga koware-ta.
wind-Obl vase-SB break[Vi]-Past
'The vase got broken (by the wind).'

(19)' 風で（花瓶が）こわれた。

?? Kaze-de (kabin-ga) koware-ta.
wind-Obl vase-SB break[Vi]-Past
'(The vase) got broken by the wind.'

The same parallel is observed here, in that although the higher argument is more prone to ellipsis than the lower argument, it is still hard to elide any arguments at all in these sentences. When the higher argument is ellipted, as in (19), the sentence looks intransitive, so that again there appears to be no missing argument, and the verbal semantics will not subcategorise the missing argument. When the lower argument is ellipted, as in (19)', the sentence can only be acceptable as an answer to a wh-question 'Who broke the vase? / what happened to the vase?' In other words, inanimate arguments are hard to elide.

5.1.3 Transitivity effects

I have demonstrated that the transitivity of sentences has a bearing on ellipsis permissibility. The following table summarises these findings, corresponding to Table 17 presented in §4.8. Each sentence structure is listed here (including prototypical intransitive sentences which are explained later in this section), with brackets showing ellipted arguments; the double bracketed arguments are more prone to ellipsis than the single bracketed arguments:

Table 18: Basic sentence structures and ellipsis

<table>
<thead>
<tr>
<th>Structure</th>
<th>Ellipted Arguments</th>
</tr>
</thead>
<tbody>
<tr>
<td>St1 Transitive</td>
<td>(S_h) O_l V_t</td>
</tr>
<tr>
<td>St1 Di-transitive</td>
<td>((S_h) (Dat_m)) O_l V_t</td>
</tr>
<tr>
<td>St2.1 Inverse</td>
<td>(S_m) ((Dat_h)) O_l V_l[Inverse]</td>
</tr>
</tbody>
</table>
Notice there is a consistent pattern in the table. Ellipsis occurs with the argument higher on the person/animacy hierarchy rather than on the basis of the grammatical subject or the position in the sentence. In reality, however, a higher argument is more often the subject than not. In all sentences except in low-transitive sentences, inanimate agent constructions, and those marked by the inverse verb, the subject is high in person/animacy hierarchy. Again, this is a natural consequence of the restructuring mechanism following the principle of direct alignment (§4.2).

The predominance of subject ellipsis is statistically supported by my analysis based on 8 texts (3 of which are expository texts) (see §5.4). Of 216 ellipted arguments, 93.5% are subjects. Nakaiwa et al. (1995) also reported a strikingly similar figure, with 91.3% of ellipted arguments (n=515) being subjects, 6.2% objects and the remaining 2.5% others (unspecified). The claim is further supported by the fact that 50.2% of subjects were ellipted, compared with only 12.3% of non-subjects in my corpus.10

§1.6.2 presented these figures and raised a question - why should subjects be more prone to ellipsis than non-subjects, and why is there such a difference in rate between them? The reason is evident now. In fact, according to Foley and Van Valin (1984:108), subjects are the target of deletion in a number of languages. Japanese

10 These figures are weighted average and there is a genre difference. For written narratives, 56.3% of subjects were ellipted, compared with 11.1% of non-subjects. For expository texts, 27.4% of subjects were ellipted, compared with 16.7% of non-subjects. See §1.6.1.
grammar takes this further by structuring sentences in such a way as to express a higher argument as the subject, and then eliding the higher argument. Consequently, ellipsis predominantly involves the subject.

Table 18 not only shows that the higher argument is more prone to ellipsis than the one lower in the same sentence, but also that the sentence structures differ in degree of transitivity. The sentences under St1, St2 and St3 are the highest in transitivity, (except St2.2 sentences involving directional verbs), and the transitivity decreases as one reads down the table. St9 (which is explained below) is the least transitive, i.e. a proto-typical intransitive sentence. An important pattern arises here, namely, that transitivity correlates with the degree of ellipsis permissibility. The higher the transitivity of a sentence, the more the argument higher in the hierarchy is prone to ellipsis. In other words, the higher arguments in high transitive sentences are more prone to ellipsis than the higher arguments in sentences with low transitivity, as we saw in the above examples. In §4.8, this situation was conceptualised it as follows. This time an element of ellipsis permissibility is added:

<table>
<thead>
<tr>
<th>More transitive</th>
<th>More ellipted</th>
<th>Less transitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>St1/St2.1/St2.3/St3</td>
<td>St4</td>
<td>St2.2/St5</td>
</tr>
</tbody>
</table>

Figure 17.2: Transitivity of structures and ellipsis

Thus, the transitivity of sentences as well as the degree of higher argument have a bearing on ellipsis permissibility.

In order to make Table 18 complete, intransitive sentences were included. Prototypical intransitive sentences (i.e. not the intransitive sentences derived from restructuring) have only one subcategorised argument. Ability to elide the argument depends on the animacy of the subject. Although the subject in intransitive sentences is generally hard to elide, there is also a difference in degree of ellipsis permissibility. Ellipted subjects are more acceptable when they are animate, human in particular, as in (19a), than when inanimate, as in (19b):

(19a) (太郎は)歩いている。
    ? (Taro-wa) aruiteiru.
    -Top walking


"(Taro) is walking.'

(19b) (雨が) 降っている。

?? (Ame-ga) futteiru
rain-SB falling

'(lit.) (Rain) is falling.'

The effect of animacy on ellipsis is statistical supported. Table 19 below is based on the same corpus (six written narrative and expository texts) as Table 16 (§4.6). It shows that animate subjects are ellipted far more frequently than inanimate subjects, regardless of the transitivity of the sentences.\(^{11}\) The numbers in brackets are number of ellipsis over total occurrences.

**Table 19: Proportion of ellipted subject**  \((n = 383\) sentences)\(^{11}\)

<table>
<thead>
<tr>
<th></th>
<th>Animate</th>
<th>Inanimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transitive</td>
<td>71.8%</td>
<td>0 # (0/2)</td>
</tr>
<tr>
<td>Intransitive</td>
<td>64.6%</td>
<td>13.2%</td>
</tr>
</tbody>
</table>

What '#' indicates is significant, in that only 2 out of 113 transitive sentences are found to have inanimate arguments expressed as the subject, and neither of these are ellipted.

Two further findings may be drawn from Table 19. Firstly, animate subjects are ellipted far more often than inanimate subjects. In other words, if the subject is inanimate, it is unlikely to be ellipted. Secondly, inanimate arguments are less likely to be the subject.\(^{12}\) Table 19 shows that of 383 sentences, 206 had animate subjects,

---

\(^{11}\) The same trend - human arguments are more prone to ellipsis than inanimate arguments regardless of the sentence transitivity - is observed in Acehnese. It is classified in terms of actor (more likely to be human) and undergoer (can be any argument, but more likely to be non-human), though Acehnese is different from Japanese in that it uses cross-referencing on the verb.

**Table 20: Acehnese: percentage of ellipsis for actors and undergoers** (Durie 1988:11)

<table>
<thead>
<tr>
<th></th>
<th>Text 1</th>
<th>Text 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transitive Actor (human)</td>
<td>81% (261)</td>
<td>80% (220)</td>
</tr>
<tr>
<td>Intransitive Actor (human)</td>
<td>73% (101)</td>
<td>73% (81)</td>
</tr>
<tr>
<td>Transitive Undergoer (inanimate)</td>
<td>36% (261)</td>
<td>35% (220)</td>
</tr>
<tr>
<td>Intransitive Undergoer (inanimate)</td>
<td>34% (180)</td>
<td>36% (107)</td>
</tr>
</tbody>
</table>

---

\(^{12}\) Similar results are found in Hinds (1983) that in the folktale of Momotaro, 101 subjects are animate, while only 4 subjects are inanimate, two of which are ellipted. See Table 5.1 in §1.6.2.
while only 70 inanimate subjects, and of those 70 inanimate subjects, only 2 inanimate subjects are found in transitive sentences. These findings vindicate the claim in §4.1 and §4.6.2; inanimate subjects are rather rare, and are extremely rare in transitive sentences. Even when such sentences occur, the arguments in those sentences are rarely ellipted (13.2%). It is plausible to assume that the rarity of inanimate subjects is because the restructuring mechanisms discourage them, following the principle of direct alignments. Furthermore, despite the earlier findings shown in Figure 17.2 that ellipsis occurs most frequently in high transitive sentences, Table 19 shows broadly comparable rates of ellipsis between transitive and intransitive sentences: 71.8% for transitive and 64.6% for intransitive. This is because the figure is based on morpho-syntactic dichotomous transitivity. However, recall that transitivity with respect to ellipsis is gradient and the figure for intransitive includes restructured intransitive sentences which are transitive in the underlying structure.

To sum up the last two subsections, ellipsis typically involves animate arguments in transitive sentences, but also occurs on animate arguments in intransitive sentences with a high degree of transitivity. The next subsection demonstrates that discourse salience also has a bearing on this trend.

5.1.4 Discourse salience effects

Discourse salience is another influential factor governing ellipsis. First, observe the following sentences involving two third person arguments: a proper noun 'Taro' and a common noun 'a lost child'. All the sentences have the underlying meaning 'Taro found a/the lost child', but have been varied so that each argument has varying degrees of discourse salience. The sentences are structured accordingly. Relevant facts regarding discourse salience for the subject arguments are stated in the square brackets. As mentioned earlier, Japanese does not have in/definite articles, so

---

13 Of 383 sentences, 276 were transitive and intransitive sentences. The remaining are such as copula sentences.
that the English translation is an approximation based on the type of subject marking and whether or not there is a demonstrative. As in the earlier part of the analysis, preferences for which argument is ellipted and acceptability judgements are based on opinions of 8 native speaker informants.

(21a) [Topicalised Taro]
    (太郎は) 迷子をみつけた。
    *(Taro-wa) maigo-o mitsuke-ta.
    -Top man-OB find[Vt]-Past
    'Taro found a lost child.'

(21b) [Topicalised Taro]
    太郎は（迷子を）みつけた。
    * Taro-wa (maigo-o) mitsuke-ta.
    -Top lost child-OB find[Vt]-Past
    'Taro found (a lost child).'</n
(21c) [Topicalised lost child]
    （迷子は）太郎にみつかった。
    (Maigo-wa) Taro-ni mitsukat-ta.
    lost child-Top -Obl find[Vi]-Past
    'The lost child got found (by Taro).'

(21d) [Non-Topicalised Taro]
    太郎が（迷子を）みつけた。
    ? Taro-ga (maigo-o) mitsuke-ta.
    -SB lost child-OB find[Vt]-Past
    'Taro found (a lost child).'</n
(21e) [Non-topicalised lost child with demonstrative]
    その迷子が（太郎に）みつかった。
    Sono maigo-ga (Taro-ni) mitsukat-ta.
    that lost child-SB -Obl find[Vi]-Past
    'That lost child got found (by Taro).'

(21f) [Non-topicalised lost child with demonstrative]
    （ある個性を）みつけた。
    Aru maigo-ga (Taro-ni) mitsukat-ta.
    certain lost child-SB -Obl find[Vi]-Past
    'Some lost child got found (by Taro).'

(21a) and (21c) show that topic marked subjects are prone to ellipsis, so that when a non-topicalised subject is ellipted instead of a topic subject, as in (21b), the sentence feels as if it has a missing argument. As discussed in §5.1.1, the wa/ga markings have a strong bearing on ellipsis. When the subject is not topicalised, it cannot be ellipted, and if anything, the object is ellipted, as in (21d), though such sentences are highly
marked and acceptable only as an answer to a wh-question in which the object is included, 'Who found the lost child?', whereby the object is referential and hence high in discourse salience.

Thus, once again, a topicalised subject is prone to ellipsis, but a non-topicalised subject is rarely ellipted. This is because the ga-marked subject is used with the function of exhaustive listing and in presenting new information, both of which tend to signal focus. In (21e) and (21f), the focus is explicitly shown by demonstratives. As discussed in §4.10.1, focused arguments cannot be ellipted and do not follow the principle of direct alignment.\footnote{In fact, the focused subject such as (21f) cannot be topicalised, as shown in (21f)'.}

Note that (21e) and (21f) are acceptable, whereas (21d) is marginal. The difference must be due to the fact that the former are intransitive, so that oblique arguments are optional. On the other hand, the latter is transitive, so the object arguments are not optional.

A question that emerges naturally at this point is what happens when a sentence contains one argument high in the animacy hierarchy and another high in discourse salience. This will be deferred to §5.5.4.

### 5.2 Principle of argument ellipsis

Based on the findings in §5.1, I now propose the following principle of ellipsis:

\begin{center}
\textbf{Principle of argument ellipsis in Japanese:}

The higher an argument is in terms of Person/animacy hierarchy and Discourse salience, the more prone it is to ellipsis, unless focus is placed on it.
\end{center}
Compare this with the formulation by Kuno (1978) who proposed the following principle for describing the phenomenon of inter-sentential deletion:

**Pecking order of deletion principle:**
*Delete less important information first, and more important information last.*

In Kuno’s principle, ‘important’ refers to ‘new’, in a sense ‘focused’ (Kuno 1995:209). Although the overall conceptualisation of Kuno's principle may appear similar to the principle of argument ellipsis which I proposed, there are crucial differences. In subsequent sections, I show how the principle of argument ellipsis can determine the referential identity of ellipted arguments, and that while Kuno's principle can explain some phenomena of ellipsis, it is inadequate for others.

### 5.3 Identifying the referent of ellipted arguments

Having introduced the principle of direct alignment and the principle of ellipsis, now I demonstrate how ellipted arguments are identified. Ellipses in simple sentences are examined in this section, multiple ellipses in §5.4, intra-sentential ellipsis in §5.5, and inter-sentential ellipsis in Chapter 6.

The principle of direct alignment regulates sentence structure based on the type of arguments and the principle of ellipsis regulates the degree of ellipsis permissibility. Together, they provide a number of vital cues about the identity of ellipted arguments. Although these cues do not pinpoint the exact referent, they reveal a number of important pieces of information, which narrow down the identity of the referent, particularly with respect to the relationship between arguments in the sentence:

1. the alignment of arguments is direct in terms of the person/animacy hierarchy and/or discourse salience;
2. if not, the sentence either has the inverse marking signalling the contrary, or is restructured to intransitive and thereby forms a direct alignment. Hence, the structure indicates differences between the arguments; transitive sentences signal $SB_h > OB_l$, while non-transitive sentences signal $SB_h > \text{Oblique}_l$ on the surface, but they are restructured from $SB_f < OB_h$ in the underlying structure. The restructuring
is systematic; it was formulated in Table 17 in Chapter 4. This formula provides information about the number of subcategorised arguments, their grammatical roles and case markings based on verbal semantics, and their relationship in the sentence;

[3] an argument with a higher value on the person/animacy hierarchy and with more discourse salience is more prone to ellipsis;

[4] the statement in [3] predicts that an ellipted subject is marked by *wa* but not by *ga*, (except in subordinate clauses, see §5.5).

The interplay of these patterns is the key to resolving the identity of ellipted arguments.

In order to clarify this point, observe the following example, which consists of one overt oblique argument 'Taro' and an intransitive verb:

\[(22) \text{先生にみつかった。} \]
\[
\text{Sensei-ni mitsukat-ta.} \\
\text{teacher-Obl find [Vi]-Past} \\
\text{'(X) got found by the teacher.' where X > teacher}
\]

The verbal semantics tells us that the verb selects two arguments, and the morphology of the verb shows that the sentence is intransitive. This means that the underlying structure has an inverse alignment, and has been restructured as an intransitive sentence, following the principle of direct alignment. The overt argument is third person: a common noun with oblique marking. By mapping these pieces of information onto the formula of argument structure in Table 17, we know that the sentence has the structure of \([S_h \text{ Obl Vi} <St5>\), from which we know that the subject has been ellipted. The formula also states that the ellipted subject X is higher than the overt argument *sensei* in terms of the person/animacy hierarchy and/or discourse salience. The principle of argument ellipsis also gives us this information. In other words, the overt argument works as a reference point on the person/animacy hierarchy and in discourse salience. This information limits the possibility of the referent of the ellipted subject to be higher in terms of the hierarchy - i.e. either first or second person, or third person that is a higher discourse salience than *sensei* (for
example, a topicalised or referential argument), or both (for example a topicalised first person).

This information is usually sufficient in a given context to resolve the identity of ellipted arguments. When it is not sufficient to identify the referent, there are two other levels of linguistic devices for referent identification. One is the set of argument inferring morphemes discussed in Chapter 3 and the other is the topic discussed in Chapter 6 on discourse devices. The exact method of referent identification is demonstrated in Chapter 7 with the introduction of the algorithm.

5.4 Multiple argument ellipses

So far I have demonstrated that, where a situation of one ellipsis per simple sentence is posited, the argument with the higher person/animacy value and discourse salience is most likely to be ellipted. Now, I extend my observation to the phenomenon of multiple argument ellipses, where more than one ellipsis occurs within a clause.\(^\text{15}\) I show how the integrated value of the hierarchy and discourse salience, and the degree of that integrated value capture the mechanisms of ellipsis more comprehensively. That is to say, any number of arguments can be ellipted, as long as they have a high integrated value for person/animacy and discourse salience. For example, in (23), all the arguments 'I', 'Taro', and 'the book' can be ellipted, and the utterance of the verbal predicate ageta alone can constitute a sentence, provided that 'Taro' and 'the book' have a high discourse salience, for example, if they have been previously mentioned. Topicalised arguments and first person are always prone to ellipsis, because they are given information and have a high value of person/animacy and discourse salience.

\[(Watashi-wa) (Taro-ni) (hon-o) age-ta.\]
\[
1sg-Top \quad Taro-IO \quad book-OB \quad give \text{[Direct]-Past}
\]
\['(I) gave (Taro) (the book). '\]

---

\(^{15}\) In my discussion up to now, because only simple sentences were examined, I have used 'sentence' very loosely, hence the term 'Sentence devices'. However, strictly speaking, I was referring to a finite 'clause' which is the basic unit, in which the predicate devices and the sentence devices operate. From here on, the terms 'sentence' and 'clause' are differentiated.
According to the principle of argument ellipsis, an argument with a higher integrated value is more prone to ellipsis, so that ellipsis is likely to occur in the order of 'I' > 'Taro' > 'the book'. This means that when a lower argument is ellipted, the higher arguments must also be ellipted. For example, if 'Taro' is ellipted, 'I' must also be ellipted, and if 'the book' is to be ellipted, the two higher arguments must also be ellipted. In other words, it is harder to elide 'Taro', if the higher argument 'I' is not ellipted, as shown in (23a); similarly, 'the book' is harder to elide if the higher arguments 'I' and 'Taro' are not ellipted, as shown in (23b).

(23a) 私は（太郎に）本をあげた。
? Watashi-wa   (Taro-ni)    hon-o     age-ta.
1sg-Top          Taro-IO    book-OB give [Direct]-Past
'I gave (Taro) the book.'

(23b) 私は太郎に（本を）あげた。
? Watashi-wa   Taro-ni   (hon-o)     age-ta.
1sg-Top          Taro-IO    book-OB give [Direct]-Past
'I gave Taro (the book).' 

(23a) and (23b) are acceptable in a limited context where the ellipted arguments are highly referential, for example, as an answer to a wh-question and a contrastive situation. Overt expressions of such inferable arguments give rise to a contrastive meaning.

The claim that a lower argument can be ellipted, if the higher arguments are also ellipted, is statistically verified in my corpus (based on 8 texts, 3 of which are expository texts), part of the figure was quoted in §5.1.3. 93.5% of 216 ellipted arguments were subjects (c.f. Nakaiwa et al. (1995) 91.3%). The remaining (6.5%) were 14 non-subject ellipses, most of which are objects. Out of 14 non-subject ellipses, 10 (4.6%) co-occurred with subject ellipsis, i.e. multiple ellipses within a clause. Only 4 (1.9%) out of 216 ellipses were cases where the subject was overt and the non-subject argument within the same clause was ellipted. In other words, [ø non-SB Verb] is frequent, but [SB ø Verb] is extremely rare. This is summarised below:

**Table 21: Proportion of argument ellipsis**

<table>
<thead>
<tr>
<th>Type of Ellipsis</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject ellipsis [ø non-SB Verb]</td>
<td>93.5%</td>
</tr>
<tr>
<td>Non-subject ellipsis</td>
<td>6.5%</td>
</tr>
</tbody>
</table>
These findings confirm the validity of the principle of direct alignment and the principle of argument ellipsis; that is to say, subjects are prone to ellipsis, and non-subject ellipsis is rare specially if the subject within the same clause is not ellipted.

The pattern [SB ø V] is observed mainly in three cases. The obvious case is where a sentence has inverse alignment marked by the inverse verb, whereby the non-subject is higher than the subject (see §5.5). Another case is where the subject is focused in meaning, as in (23a) and (23b). The other case may be when a subject is a lot higher in the animacy than a non-subject (i.e. inanimate argument), but the non-subject is referential and high in discourse salience, as in (23a) and (23b) (see §5.5). If this non-subject with high discourse salience also had the same or higher animacy than a subject, the sentence would have been restructured to place it as the subject.

In terms of referent identification, since non-subject arguments are complementary to the subject in the clause, the identification of subject ellipsis has a significant bearing on that of non-subject ellipses. Similarly, sentences structures are in complementary distribution determined by the value of arguments. As shown in §4.8, (24a) is in complementary distribution with (24b); (24a) is used for sentences with direct alignment, and (24b) is used for sentences with inverse alignment in the underlying structure. The verbal semantics requires that both sentences select two arguments, the caller and the receiver of the call, but they have both been ellipted.

(24a) Direct underlying structure
\[ \text{電話をした。} \]
\[ Denwa-o \quad shi-ta. \]
telephone-OB do-Past
'(lit.) (X) made a call (to Y). --> (Xl) called (Yj).'

(24b) Inverse underlying structure
\[ \text{電話があった。} \]
\[ Denwa-ga \quad at-ta. \]
telephone-SB exist-Past
'There was a call (for X from Y). --> (Yj) called (Xl).'
The structure of sentences signals that in (24a) the caller is higher than the receiver, and in (24b) the situation is reversed. This is all the information we can attain from observing the sentences in isolation, and intersentential devices are needed to proceed any further in referent identification. How this information can be exploited for the exact identification of ellipses, i.e. referent identification in multiple ellipses and for non-subject ellipses, is elaborated in Chapter 6 which introduces discourse devices and systems called the 'salient referent list'.

5.5 Ellipsis in complex sentences

So far I have explained the principle of argument ellipsis in terms of simple sentences. In this section, I examine complex sentences (intra-sentential ellipsis), and in Chapter 6 inter-sentential ellipsis. The principle of argument ellipsis is more crucial in the make-up of structures in complex sentences and inter-sentential situations than in simple sentences.

First, consider the following sentence (from Morita 1985:206) which was composed by a learner of Japanese:

(25a) 町の人たちは兵隊がみつけないように隠れた。

'People of the town hid (themselves) so that the soldiers would not find (them).'</n
Although (25a) may appear structurally grammatical and semantically makes sense, it sounds peculiar to native speakers of Japanese, and certainly would not be uttered by a native speaker of Japanese. In fact, (25a) is not only ungrammatical, but also gives rise to a semantic ambiguity. The ellipted object can be coreferential either with the matrix subject (because there is no other possible candidate as the referent) or with something/someone else.

The reason for the unacceptability of (25a) is easily explicated using the principle of direct alignment; that is, the argument structure of the subordinate clause shows inverse alignment in terms of discourse salience. The subject argument 'soldiers' in the subordinate clause has a lower discourse salience than the ellipted
object, because the object is coreferential with the matrix topic, i.e. has a prior mention. This sentence becomes acceptable, therefore, if the subordinate clause is restructured into an intransitive, for example, in order to form direct alignment, as shown in (25b):

(25b) 町の人たちは兵隊にみつからないように隠れた。

'town-of people-Top SB soldiers-by find[Vi]-Neg Purp hide[Vi]-Past
'People in the town hid (themselves) so that (they) would not get found by the soldiers.'

Thus, the principle of direct alignment governs the structure of clauses in complex sentences and the pattern of ellipsis.

5.5.1 Other approaches

Now, I consider other approaches in the literature, so as to compare how they deal with complex sentences such as (25a) and (25b). Kuno's 'Pecking order of deletion principle', 'Delete less important information first, and more important information last', can explain why (25b) is acceptable, but not why (25a) is unacceptable. That is to say, since both (25a) and (25b) satisfy Kuno’s principle, it cannot account for the difference between them. Kuno also proposes another principle (1995:222), which specifies the order of arguments:

**Flow of information principle:**
*Elements in a sentence that do not contain emphatic stress or morphologically marked focus are ordinarily arranged in the order 'less important information first and more important information last.'*

When these two principles are combined, they are more tenable; the combination of both principles suggests that less important information is placed first and is deleted first. In this way, Kuno's principles can rule out (25a). However, they still do not adequately account for the difference in acceptability between (25a) and (25b). If word order flexibility is utilised, the underlying order of (25a) can be assumed to be (O)S. This will, in fact, incorrectly predict that (25a) is acceptable. Hence, it is not simply a matter of the order/position of arguments. Kuno's principles do not address
the structure of sentences and the contents of arguments apart from focus. As a result, they cannot account for acceptable sentences such as (25c), where the subordinate clause does not have the order of 'old to new', and the ellipted argument is not the first but the second argument.

(25c) 町の人たちは私がみつけないように隠れた。
*Machi-no hitotachi-wa [watashi-ga øi mitsuke-nai yooni] kakure-ta.*
'town-of people-Top 1sg-SB ØB find[Vt]-Neg Purp hide[Vi]-Past'
'People of the town hid (themselves) so that I would not find (them).'

The principle of argument ellipsis, on the other hand, adequately accounts for sentences such as (25c). The subordinate clause has a direct alignment in terms of the person/animacy hierarchy, in that the subject (first person) is higher than the object (third person), even though the object has higher discourse salience than the subordinate subject, because it is coreferential with the matrix subject which is also topicalised.

This shows that when a sentence contains two arguments, one high on person/animacy the hierarchy and the other high in discourse salience, the sentence can be structured in terms of the hierarchy, as in (25c), (which exemplifies the pattern [SB ø V]), or in terms of discourse salience, as in (25b). This answers the question raised in §4.7.1 regarding the need to keep the two constraints (the animacy hierarchy and discourse salience), given the strong correlation they have. §5.5.3 will examine which of the two is the prime factor governing the alignment of argument.

5.5.1.1 Object ellipsis

The phenomenon of object ellipsis, such as seen in (25a,c), has been considered by some linguists (Kuroda 1965, Ohso 1976, Kameyama 1986). Kuroda (1965, cited in Kameyama 1986:49) claims that a subordinate zero-object, i.e. ellipted object, cannot be coreferential with the matrix subject as in (26a), unless it is in an adverbial clause, as in (27a) (examples from Kuroda):

(26a) ジョンはビルが追い抜く事を期待している。
*Johni-wa [Bill-ga øi oinuku koto] o kitaishiteiru.*
'Top SB OB surpass Nomz OB anticipate'
'John anticipates that Bill will surpass (him).'
Kameyama (1986) and Ohso (1976) agree with Kuroda about the acceptability of (27a). However, my Japanese informants find that (27a) is just as stylistically infelicitous and unacceptable as (26a), although (27a) is semantically less ambiguous than (26a) because of the verbal semantics. The referent of the ellipted object in (26a) can be any person, but the interpretation that it is coreferential with the matrix subject is hard to obtain. On the other hand, no such ambiguity exists for (27a).

I contend that the fundamental reason for the unacceptability of (26a) and possibly (27a) is, analogous to the case of (25a). It is due to the violation of the principle of direct alignment that the subordinate clause shows an inverse alignment without the inverse verb. Hence, a similar restructuring, i.e. turning the subordinate clause into either intransitive or passive for example, will make the sentences felicitous and unambiguous.
Kuroda's claim is invalid in these examples, because the objects in subordinate clauses are coreferential with the matrix subjects. Hence, I argue against Kuroda's claim that the unacceptability of sentences, such as (26a), is not entirely due to the grammatical relations of arguments, such as the object, i.e. that a subordinate ellipted object cannot be coreferential with the matrix subject, or the function of clauses such as adjunct.

Analogously, Kuno's principles are inadequate, in that they do not provide a unified account as to why (26a) and (27a), on the one hand, are unacceptable, while (28) and (29), on the other, are acceptable. Kuno's Flow of information principle places emphatic stress as an overriding element to his principle. If we assume that emphatic stress is placed on the subject in the subordinate clause in (28) and (29), which is quite possible, the sentences would fit within his principles. However, this treatment will seem rather ad hoc and non-descriptive, unless emphatic stress is explicitly defined so as to rule out (26a) and (27a).

The mechanisms of ellipsis are better captured by the principle of direct alignment and the principle of ellipsis. The fundamental reason for the unacceptability of the above examples is the violation of the principle of direct alignment. The principle of direct alignment can be satisfied by either the person/animacy hierarchy, discourse salience, or both, so that if the subject in the subordinate clause has a higher person/animacy value than the object, for example, is a first person subject, as in (28) and (29), then the clause forms a direct alignment and is acceptable.

As a consequence, such clauses have different subjects. Table 14.2 in §3.5.2.2 showed the preference to SS structures against DS structures, in that 65% of complex sentences have a SS structure. (28) and (29) show the cases of DS structures, and demonstrate that as long as the principle of direct alignment is satisfied, DS structures are also acceptable, though are less preferred to SS structures.
Take another example illustrating that not all sentences with same subject are acceptable. A learner of Japanese composed (30a). The learner seems to intuitively know the preference for SS structures, but he does not realise that other factors are also important in constructing sentences. Consequently, even though both clauses in (30a) have the SS structure, the sentence is unacceptable.

(30a) 大阪の会社が私を雇ってくれて、私に英語を教えてもらう。

*Osaka-no kaisha-ga watashi-o yatot-te kure te,
Osaka-Gen company-SB 1sg-OB employ-and give[inverse] and,
øi watashi-ni eigo-o oshie te morau.
SB 1sg-IO English-OB teach and receive[converse]
'The company in Osaka employed me, and (they) are going to receive English lessons from me.'

The reasons for the unacceptability of (30a) are as follows. First, Japanese disfavors an inanimate subject in transitive sentences, except when it is metonymically used to represent people. But, as mentioned in §4.6.2, such inanimate subjects are often marked by -de (locative/instrumental) instead of the canonical nominative -ga. The use of inanimate subject in transitive sentences gives rise to an inverse alignment, hence the inverse verb is used, which (30a) has. However, as explained in §3.2.2, the inverse verb has a scope only within the clause, so that the same subject is not carried over to the next clause and hence a different subject needs to be set up. Instead, (30a) used a converse verb to keep the same subject.

However, a problem arises from the implications associated with the use of Japanese benefactive verbs which do not hold for equivalent English verbs. The benefactive verb morau 'to receive' in (30a) emphasises the company's benefit from the speaker for receiving English lessons. It is culturally inappropriate for the speaker to express other people's benefit derived from the speaker's deed. Since the benefactive verbs convey such a connotation, (30b) without the benefactive verb is a better way of expressing the logical content, even though it now has different subjects.

(30b) 大阪の会社が私を雇ってくれて、私が英語を教えることになっている。

Osaka-no kaisha-ga watashi-o yatot te kure te,
Osaka-Gen company-SB 1sg-OB employ and give[Inverse] and,
watashi-ga eigo-o øi oshieru kotoninatteiru.
Chapter 5

1sg-SB English-OB IO teach scheduled

'The company in Osaka employed me, and I am going to teach (them) English.'

What is even better and sounds more natural is (30c) which keeps the same subject.

(30c) 私は大阪の会社に雇われて、英語を教えることになっている。
Watashi-wa Osaka-no kaisha-ni yatow-are te,
1sg-Top Osaka-Gen company-Obl employ-Pass and,
øi eigo-o øj oshieru kotoninateiru.
SB English-OB IO teach scheduled

'I am employed by the company in Osaka, and (I) am going to teach (them) English.'

The issue of sentences with same subjects is elaborated in §5.5.3.

5.5.1.2 Identification neutral descriptions

Ohso (1976) and Kameyama (1986) give a slightly different account of ellipted subordinate objects appearing in adjuncts. Kameyama and Ohso agree with Kuroda’s claim that a subordinate zero-object cannot corefer with the matrix subject, as in (26a), but can in an adjunct, as in (27a), by treating adjuncts as an exception to the generalisation, namely by treating them as ‘identification-neutral descriptions’.

Identification' refers to the argument that the speaker identifies or empathises with, so that no arguments receive identification in ‘identification-neutral descriptions’. (26a) and (27a) are presented here again for convenience:

(26a) ジョンはビルが追い抜く事を期待している。
TopSB SB OB surpass Nomz OB anticipate

'John anticipates that Bill will surpass (him).'

(27a) Adjunct: Identification-neutral description
ジョンはビルが叱った部屋で泣いている。
Johni-wa [Bill-ga øi shikatta] heya de naiteiru.
TopSB -SB OB scolded room in crying

'John is crying in the room where Bill scolded (him).'

---

16 Identification can have two different stances: speaker's viewpoint or protagonist’s viewpoint (i.e. logophoric).
The notion of identification-neutral description seems ad hoc, since it is not clear on a priori grounds why (26a) is not an identification-neutral description, but (27a) is. This is elaborated later in this subsection.

Moreover, Ohso (1976) pointed out a further exception: if adjuncts are not identification-neutral, zero-objects cannot be coreferential with the matrix subject; for example, when the matrix subject is either the first person as in (31), or logophoric as in (32) (examples from Ohso 1976:41-42):

(31) 私はビルが叱った部屋で泣いている。
    *Watashi-i-wa [Bill-ga oj shikatta] heya de naiteiru.
    TopSB SB OB scolded room in crying
'I am crying in the room (where) Bill scolded (me).'

(32) ジョンはビルが議長におした時、びっくりしたそうだ。
    *Johni-i-wa [Bill-ga oj gichoo ni oshita toki,] bikkurishita soo-da.
    TopSB -SB OB chairman for recommended when, surprised (I) hear-Cop
'I hear that Johni was surprised when Bill recommended (himi) for chairman.'

These three layers of Ohso's approach are unwieldy; that is, the general principle of zero-object, exceptions for zero-object in adjuncts, which then allow further exceptions for non identification-neutral sentences, such as (31) and (32).

Kameyama’s approach uses a 'Property sharing constraint', which was explained in §2.5.2.2. It says that zero pronominal binding is acceptable, if one or more of the following properties are shared between the antecedent and the zero pronominal; non/Subject and non/Identification. In other words, ellipsis should apply to the subject if the antecedent is the subject, and ellipsis should have the speaker's identification if the antecedent has the 'speaker's identification' This formulation adequately explains the unacceptability of (26a), (31) and (32). As for the issue of a zero-object being coreferential with the matrix subject, Kameyama (1986:68) says that zero pronominal binding with no shared property is possible, only if the sentence is identification-neutral. Hence, she accepts (27a) by treating the sentence as an identification-neutral description. Again, no specific description of identification-neutral was given.
Kameyama’s approach is more tenable than Ohso’s, in that it is a simpler account and its conceptualisation is realistic. Her property sharing constraint captures discourse coherence. It is naturally easier to process sentences, if the grammatical function and the speaker's empathy of an ellipsis are the same as those of the referent. However, Kameyama’s constraint still cannot account for examples, such as (28) and (29), which are acceptable, even though there is a mismatch of the properties within the same sentence; 'John' in the main clause is the subject and has the speaker's identification for being the topic, whereas 'John' in the subordinate clause is not the subject, and probably does not have the identification either, because 'I' the speaker is the unmarked choice for the identification.

(28) ジョンは私が追い抜く事を期待している。
John-i-wa [watashi-ga øi oimuku koto] o kitaishiteiru.
TopSB 1sg-SB OB surpass Nomz OB anticipate
'John anticipates that I will surpass (him).'

(29) ジョンは私が叱った部屋で泣いている。
John-i-wa [watashi-ga øi shikatta] heya de naiteiru.
TopSB 1sg-SB OB scold-Past room in crying
'John is crying in the room (where) I scolded (him).'

Once again, I contend that what is happening in these sentences is fundamentally governed by the principle of direct alignment. This principle solves these problems in a much simpler and more consistent manner. The unacceptability of (26a), (31) and (32) stems from the same reason as the unacceptability of (25a). That is to say, arguments in subordinate clauses show an inverse alignment, namely, first person and logophoric argument 'John' have a higher value than a newly introduced or non-topicalised 'Bill', and yet Bill was expressed as the subject.

A basic problem with Kameyama and Ohso's approach is that the characterisation of this alleged ‘identification-neutral descriptions’ is elusive. For example, no definition is given to establish why (33) is identification-neutral and therefore acceptable, but (34) is not, even though both of these subordinate clauses are structurally adjuncts.

(33) (=27a)
ジョンはビルが叱った部屋で泣いている。
John-i-wa [Bill-ga øi shikatta] heya de naiteiru.
Chapter 5

TopSB -SB OB scolded room in crying
'John is crying in the room where Bill scolded (him).'

(34) (=32)
ジョンはビルが議長におした時、びっくりしたそうだ。
*Johni-wa [Bill-ga øi gichoo ni oshita toki,] bikkurishita soo-da.
TopSB -SB OB chairman for recommended when, surprised (I) hear-
Cop
'(I) hear that Johni was surprised when Bill recommended (himi) for chairman.'

Kameyama (1986) acknowledges the problem of a lack of clear definition for identification-neutral description, and raises problematic sentences of this nature where the ellipted object can have a matrix subject antecedent and there is no obvious identification property shared between them. I examine two such examples from Kameyama (1986:67):

(35) 花子が太郎が映画に誘った事を喜んでいた。
Hanako-i-ga [Taro-ga øi/j eiga ni sasotta koto] o yorokondei-ta.
SB SB -OB movie to asked-out Nomz OB glad-Past
'Hanako i was glad that Taro had asked (heri / someonej) out to a movie.'

Even though (35) is rated as acceptable by Kameyama, it was unacceptable to eight native speakers of Japanese whom I consulted. They say that it is hard to obtain a coreferential reading of the ellipted object with the matrix subject in (35). This means that even if the sentence has no identification property shared between the referent and the ellipsis, they still can be not coreferential. The informants suggested that if the referent and the ellipsis are meant to be coreferential, (35) would be expressed as (35a) or (35b): 17

(35a) 花子が太郎が映画に誘ってきた/くれた事を喜んでいた。
Hanako-i-ga [Taro-ga øi/*j eiga ni sasot-te kita/kureta koto] o yorokondei-ta.
SB SB OB movie to asked-out came/gave[Inverse] Nomz OB glad-
Past
'Hanako i was glad that Taro had asked (heri / someonej) out to a movie.'

(35b) 花子が太郎が映画に誘われた事を喜んでいた。
Hanako-i-ga [øi/*j Taro-ni eiga ni sasow-are-ta koto] o yorokondei-ta.
SB SB -Obl movie to asked-out-Pass-Past Nomz OB glad-
Past
'Hanako i was glad that (shei / *someonej) was asked out to a movie by Taro.'

17 Without contexts, (35a) and (35b) can be still ambiguous. However, Chapter 6 will demonstrate that ellipsis signifies 'sameness' of denotation and that disjoint readings must make arguments expressed overt.
These sentences show the principle of direct alignment at work; the verbs in (35a) mark inverse alignment, and (35b) is the restructuring of (35a) into a passive sentence.

Another example which Kameyama presents is (36). It is indeed the case here that the ellipted object can have the matrix subject as its antecedent, although there is no obvious identification property shared between them.

(36) ジョンがビルが殴ったと言った。

I suggest that 'identification-neutral descriptions' of this type are 'reportive clauses' indicated by the complementizer 'to' and a reportive verb ‘itta’ (said). The subordinate clause in reportive clauses in Japanese is direct speech which quotes exactly what was said (Anzai 1983). Hence, the ellipted object in the subordinate clause is unaffected by and independent of identification of the antecedent in the main clause. This means that discourse salience of the ellipted object is also independent of that in the main clause, i.e. the matrix subject 'John' is not seen as a prior mention, which would otherwise affect discourse salience of the ellipted object in the subordinate clause. Hence, the argument alignment of the subordinate clause does not show inverse alignment in this respect, so it does not violate the principle of direct alignment. However, other problems remain. Two interpretations are possible as the referent for the ellipsis: John and someone else. When the referent of the ellipted argument is 'John' and is coreferential with the matrix subject, i.e. John says 'Bill hit me', the sentence shows inverse alignment. As explained in §4.10.4, action verbs have the propensity to present information with the agent as the subject and the speaker as the object. In terms of the other interpretation, when the referent of the ellipted object is someone else, then it does not show inverse alignment, but it violates the principle of ellipsis, by virtue of the fact that since the subject has higher discourse salience than the object, the object should not normally be ellipted unless the subject is ellipted. There are two possible reasons for this. Firstly, (36) with the ellipted object is possible as an answer to a wh-question 'Who hit (X)?' or in a context
that is situationally obvious, where the fact that X was hit is given information. In such a case, there is no ambiguity about the identity of referent. Secondly, as explained in §4.10.1, focused arguments cannot be ellipted. The subject in the subordinate clause is marked by *ga*, which implies that it is focused, and verbs such as 'to hit' emphasise who the agent is by marking them by *ga*. Usually, in these sentences, the object is made overt, as mentioned in §4.10.4, so that in reality, there is no ambiguity regarding the referent. Since (36), one of Kameyama's sentences, is a constructed sentence, it may not necessarily be natural.

In summary of various approaches to ellipsis, I contend that the case by case approach of Ohso's is complicated, Kameyama's approach is not fully adequate due to the elusive nature of the speaker's identification, and Kuno's principles are too broad to capture the range of differences associated with ellipsis. The phenomena of ellipsis extend beyond that which has been accounted for. I contend that the principle of direct alignment and the principle of argument ellipsis offer a more unified and consistent explanation for the overall mechanisms of ellipsis.

### 5.5.2 World knowledge for sentence acceptability

I have demonstrated the importance of the principle of direct alignment for explicating the grammaticality of sentences. However, some sentences violate this principle and are nevertheless still fairly acceptable. §4.10 outlined some of the elements that are responsible for this, and world knowledge is another such element. In deciding on the acceptability of sentences, the issue of semantic ambiguity has come up a number of times. For example, we observed that (26a) is unacceptable, while (27a) is acceptable:

(26a) ジョンはビルが追い抜く事を期待している。  
*Johni-wa [Bill-ga øi oinuku koto] o kitaishiteiru.*  
Top SB OB surpass Nomz OB anticipate  
'John anticipates that Bill will surpass (him).'</a>

(27a) ジョンはビルが叱った部屋で泣いている。  
Johni-wa [Bill-ga øi shikatta] heya de naiteiru.  
Top -SB OB scolded room in crying  
'John is crying in the room where Bill scolded (him).'
In this subsection, I illustrate that subtle differences in acceptability of sentences, such as the above, cannot be adequately explained just by syntax (e.g. adjuncts) or empathy / speaker's identity. Instead, more fundamentally, the acceptability of these sentences is affected by semantic ambiguity, in which world knowledge has a part. When world knowledge can eliminate the possibility of ambiguity, the sentence becomes acceptable. For example, (26a) is ambiguous in that the referent can be 'John' or someone else, because there is no direct or sequential relation of meaning between the verbs 'surpassing' and 'anticipating'. On the other hand, (27a) is less semantically ambiguous than (26a) because of the verbal semantics; the referent of the zero-object in (27a) is most likely 'John', because it makes sense to interpret the sentence as follows: John was scolded, and as a result of that, the same person, rather than someone else, is now crying. It is of course possible to have the other interpretation, but this takes more inference and context to be justified.

Analogously, (37) is unacceptable, because the referent of the ellipted object is ambiguous; it can be John or someone else. But (38), though structurally identical with (37), is acceptable. Even though, strictly speaking, there is a potential ambiguity in meaning here, it is reasonable to expect on the basis of world knowledge that 'Bill spoke to John and - the same John, rather than someone else - was surprised by that'.

(37) (32) ジョンはビルが議長におした時、びっくりした。
*Johni-wa [Bill-ga øi gityoo ni oshita toki,] bikkurishita.
Top SB OB chairman for recommended when, surprised 'Johni was surprised when Bill recommended (himij) for chairman.'

(38) ジョンはビルが声をかけた時、びっくりした。
Johni-wa [Bill-ga øi koeokaketa toki, bikkurishita.
Top SB IO spoke to when surprised 'Johni was surprised, when Bill spoke to (himij).'

Moreover, we can observe a pattern in Ohso's examples of 'identification-neutral descriptions' which also reveal world knowledge as an influential element for the acceptability of sentences. The following examples are from Ohso (1976:37, cited in Kameyama 1986:68), except for (40b), which is added for comparison:

(39a) その女は尾行していた男に殺された。
That woman was killed by the man who was shadowing (her).'

That woman was killed by the man whom (she) was shadowing.'

'A pretty girl bit a man whom (she) tried to kiss.'

(39a) and (40a) are the unmarked interpretation where the ellipted subject of the relative clause is coreferential with the head of relative clause. The interpretation in (39b) that the ellipted subject of the relative clause is coreferential with the matrix subject is also suggested by Ohso and Kameyama. Strictly speaking, to achieve this interpretation without ambiguity, the reflexive pronoun 'jibun' (self) must fill the empty subject slot.

What is interesting here is that although (39b) structurally parallels (40b), the interpretation in (40b) is hard to obtain. This is probably why (40b) was not considered by Ohso at all. The reason for this untenable interpretation relates to two elements in verbal semantics reflected in world knowledge. One is that the two actions of 'kissing' and 'biting' represent opposing types of actions, so that without an adverse conjunctive particle or some sort of linguistic indication showing the contrary, the sentence sounds peculiar with the interpretation that the two actions was carried out by the same subject. The other is that it would be a more normal course of events in our world knowledge for a man to try to kiss a woman and the woman to bite the man, than for a woman to try to kiss a man and also to bite him.

---

18 Following Kamayama's notation, 'e' is coreferential with the NP that the relative clause modifies.
When people interpret sentences, they unconsciously relate the meaning of the sentences to their knowledge of the world to see if things make sense. That is to say, the grammaticality of a sentence does not guarantee that the sentence is comprehensible. The sentence must make sense for addressees to fully understand the meaning. Kameyama (1992:377) states an analogous idea that discourse understanding combines both linguistic interpretation and commonsense reasoning. In addition, what Evans (1993) calls 'discourse placedness' is an important factor; an utterance does not exist independently in isolation from other utterances, but must be appropriate and relevant in a given discourse environment.

People (non-grammarians) tend to pay attention to the meaning more than to the grammaticality of the sentences, so that they are generally rather tolerant of the ungrammatical sentences to a certain degree, as long as they are unambiguous and make sense. For example, (41) is taken from a magazine:

(41) この注射は体の弱い子に良く効いて、見違えるほどよくなる。

Kono chuusha-wa karada-no yowai ko-ni yoku kii te,

this injection-Top body-Gen weak child-Dat well work and

ø michigaeru yooninaru.

hardly recognisable become

'This injection works well on frail children, and (those children) become incredibly healthy.'

(PHP 8.1993)

Grammatically, the expected reading for the referent of the ellipted subject in the subordinate clause is the same as the subject in the main clause, since the matrix subject is marked wa and te signals SS reading (see §3.5). However, the referent is not the subject but the dative argument, i.e. children. This reading is suggested by world knowledge, deductive logic, and verbal semantics, because it just does not make sense to take the syntactically derived SS reading for the sentence, namely, 'This injection works well on frail children, and (it) becomes incredibly healthy.'

Thus, world knowledge plays an important role in judging the acceptability of

---

19 A comparable example can be also found in English, for example, 'Having completed the course, the books are behind me.' where the unexpressed subject of dependent clause is expected to be the same as the matrix subject.
sentences and understanding the meaning of sentences correctly. Even when sentences are ungrammatical, world knowledge can help providing correct interpretations by taking precedence over the syntactic based interpretations. Furthermore, subtle variations sometimes occur in the acceptability of sentences among native speakers. It is reasonable to suppose that differences in experience of the world have a bearing on this.

5.5.3 Preference of discourse salience over hierarchy

We have observed that when a sentence contains one argument that is high on the person hierarchy but another argument is high in discourse salience, the sentence can be presented in two ways: either paying attention to the value of the person/animacy hierarchy, as in (26a) and (27a), or to discourse salience, as in (26b) and (27b). Both sentences are acceptable.

[ the person/animacy hierarchy > discourse salience ]

(26a) ジョンは私が追い抜く事を期待している。
Johni-wa [watashi-ga o(i)/(j) oinuku koto] o kitaishiteiru.
TopSB 1sg-SB OB surpass Nomz OB anticipate
'Johni anticipates that I will surpass (himi/(j)).'

(27a) ジョンは私が叱った部屋で泣いている。
Johni-wa [watashi-ga shikat-ta] heya de naiteiru.
TopSB 1sg-SB OB scold-Past room in crying
'Johni is crying in the room where I scolded (himi).'

[ discourse salience > the person/animacy hierarchy ]

(26b) ジョンは私が追い抜かれる事を期待している。
Johni-wa [o(i) watashi-ni oinuka-reru koto] o kitaishiteiru.
TopSB SB 1sg-Obl surpass-Pass Nomz OB anticipate
'Johni anticipates that (hej) will be surpassed by me.'

(27b) ジョンは私が叱られた部屋で泣いている。
Johni-wa [a(i) watashi-ni shika-rare-ta] heya de naiteiru.
TopSB SB 1sg-Obl scold-Pass-Past room in crying
'Johni is crying in the room where (hej) was scolded by me.'

Overall, however, there seems to be a preference for discourse salience over the person/animacy hierarchy in determining the alignment of arguments. When sentences are structured to take precedence on the basis of discourse salience, they
follow the discourse coherence and flow naturally. On the other hand, when sentences are structured to take precedence on the person hierarchy, they disturb discourse coherence, and this gives rise to a focus on the subject in the subordinate clause. Hence, they tend to occur when the subject is focused. Most importantly, my informants claimed that sentences assigning preference to the person/animacy hierarchy sometimes leave room for ambiguity, since the coreferentiality of the ellipted object with the matrix subject is implied but not necessarily licensed, whereas sentences constructed on the basis of discourse salience leave no such ambiguity. Hence, discourse salience seems to be assigned preference over the person hierarchy in determining argument structures, unless the subject argument is focused.

5.6 Summary and implications from argument structure and ellipsis

In this section, I summarise the discussion of Chapters 4 and 5, which explicate 'sentence-level' devices, and consider implications that have arisen from them.

In Chapter 4, I demonstrated that argument structures in Japanese are organised in such a way to follow the principle of direct alignment. Direct alignment represents the relationship between the arguments in a sentence in terms of two constraints - the person/animacy hierarchy and discourse salience - and this relationship determines the argument structure. This relationship is manifested in the basic formulae of argument structure, shown as Table 17. This set of formulae provides information about the number of subcategorised arguments, the types of case markers which represent their grammatical and functional roles, and their relationships to each other in the sentence.

We can detect the existence of ellipses by referring to these formulae, and recover the referential identity of ellipted arguments from the pattern of argument structure which signals the relationship between the arguments. In Chapter 5, I have demonstrated that the principle of argument ellipsis draws upon the principle of and constraints on argument structure. The principle of argument ellipsis determines which arguments can be ellipted, namely, the higher an argument is in terms of the
person/animacy hierarchy and discourse salience, the more prone it is to being ellipted. The pattern of argument ellipsis was shown in Table 18. The following table combines Table 17 and Table 18 as a summary to show the patterns of argument structures and ellipsis.

Table 22: Basic patterns of argument structures and ellipsis in Japanese

<table>
<thead>
<tr>
<th>Principle: Direct alignment</th>
</tr>
</thead>
</table>

[Constraint 1: Person/animacy Hierarchy]  
[Constraint 2: Discourse salience]

### Transitive sentence Direct: \(<St>\) (Sh) O^l Vt

#### Restructuring

1. Retaining transitivity:  
   - S\_1 O\_1 H Vt / S\_m O\_1 H O\_1 Vt (di-transitive) -->
     - Inverse (benefactive verb) \(<St2.1>\) S\_i (O\_h) Vt[inverse]
     - Inverse (directional verb) \(<St2.2>\) S\_i Obl\_h Obl\_m Vi
     - Converse \(<St3>\) (Sh) obl[ni]m O^l Vt[converse]

2. De-transitivization:  
   - S\_1 O\_1 Vt --> Vi
     - Passive \(<St4>\) (Sh) obl[ni]l Vt+passive
     - Intransitive \(<St5>\) (Sh) obl[ni]l Vi
     - Low-transitive sentences \(<St6>\) (Top[waz]h) O\_1[ga] Vi/Adj
     - Existential \(<St7>\) (Obl[ni]h) Obl[kara]m S\#^IA Vi[existential/inverse]

Inanimate agent S\_A O\_P Vt --> \(<St8>\) (Obl[de],A) S\_P Vi

---

I have also pointed out that the sentence structures in the table show a varying degree of transitivity and that this transitivity correlates with the degree to which ellipsis is permissible. That is, not only does an argument need to be high in terms of the person/animacy hierarchy and discourse salience to be ellipted, but also the transitivity of the sentence has an effect on ellipsis permissibility. For example, a higher argument in \(<St1>\) is more prone to ellipsis than a higher argument in \(<St8>\);
the former argument is almost always ellipted except when it is first mentioned, while the latter is much less likely to be ellipted.

<table>
<thead>
<tr>
<th>More transitive</th>
<th>More ellipted</th>
<th>Less ellipted</th>
</tr>
</thead>
<tbody>
<tr>
<td>$St1/ST2.1/ST2.3/ST3 &gt; ST4 &gt; ST2.2/ST5 &gt; ST6 &gt; ST7 &gt; ST8$</td>
<td>$ST4 &gt; ST2.2/ST5 &gt; ST6 &gt; ST7 &gt; ST8$</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 17.2: Transitivity of structures and ellipsis**

Thus, the transitivity of sentences as well as the degree to which one argument is higher than another has a crucial bearing on ellipsis permissibility.

The pattern of argument structure and ellipsis in Table 22 can be further condensed into the following four structures:

**Table 23: Essence of argument structures and ellipsis in Japanese**

1. Transitive $<St1,3>$  ($SB_h$) $OB_l$ $Vt$
2. Transitive (inverse) $<St2>$  ($SB_l$) $OB_h$
3. Restructured Intransitive $<St4,5>$  ($SB_h$) $Obl_l$ $Vi$
4. Low-transitive $<St6,7,8>$  ($Top_h$) $SB_l$ $Vi$

The following generalisation can be drawn from the above with respect to argument structure and patterns of ellipsis. Japanese sentences are built around a higher argument (which tends to be placed in initial position and, except for in low-transitive sentences, is expressed as the subject), and structured so as to place the higher argument as the pivot which is ellipted. Since, more often than not, the higher argument is human, roughly, this generalisation can be rephrased as follows:

*The organisation of Japanese sentences has a propensity to be egocentric and anthropocentric, in that it is structured to have a human argument, particularly the first person, as the pivot and the topic, predominantly the subject, but the human argument is often ellipted so that it is invisible on the surface.*

This is particularly the case in low-transitive sentences; when a human topic argument is ellipted, the structure appears like an intransitive sentence, so that the ellipsis is not at all obvious.
This finding differs significantly from the view held by a number of Japanese linguists, discussed in §1.7.4. They claim that Japanese structures sentences in such a way as to focus on a situation/event with a preference for intransitive structure, whereas English structures sentences to focus on people with preference for transitive structure. While a part of the commonly held view that preference for intransitive structures is supported, this study has shown that the structures of Japanese sentences are, in fact, fundamentally oriented towards human arguments. The following example demonstrates this point (see §4.6.2). English expresses the following logical content using a simple transitive sentence with no overt human argument on the surface. On the other hand, Japanese expresses the same logical content using a subjunctive sentence (i.e. a complex sentence) with human as the subject, because Japanese does not allow an inanimate subject in transitive sentences. But these human subjects are ellipted, so that they are invisible on surface.

(42) 旅行すると、予測もしなかった感情を味わう。
Ryokosuru-to, yosokumoshi-nakat-ta kanjoo-o ajiwau.
trip-when, expect-Neg-Perf sentiments-OB taste
'(lit.) When (you) travel, (you'll) taste unexpected sentiments.'
--> A trip evokes unexpected sentiments.'

Human arguments are even less obvious in low-transitive sentences. They disguise their central role by being marked by an oblique. For example, (43) appears on the surface as 'Water wants to drink', and a complete intransitive sentence without ellipsis, since 'water' is marked by the nominative ga which proto-typically marks the subject. However, the use of tai (want) signals that the sentence is a low-transitive sentence which has an ellipted human actor. Hence, the human participant is implied in a very subtle way.

(43) 水が飲みたい。
Mizu-ga nomi tai.
water-NomOB drink want[Adj]
'(I) want to drink some water.'

Finally, since Japanese turns out to be a 'people-focus' language, the mechanism by which high (human) arguments are ellipted is highly economical,
because they are referred to a lot more often than inanimate arguments, and this eliminates the need to repeat the same referent.
Chapter 6  *Discourse devices: Ellipsis as unmarked representation of sameness*

In the preceding two chapters, I examined the sentence devices, by which Japanese sentences are structured in such a way as to center the subject, which is most prone to ellipsis. This chapter examines how these sentences are cohesively sequenced with the topic as a pivot, which may then be ellipted. This cohesive structuring of discourse around a continuous subject/topic is performed by the third type of linguistic device for referent identification, which I shall call 'Discourse devices'. The crucial aspect of this account for identifying referents is the differentiation of *wa* (the topic marker) and *ga* (the nominative marker) in relation to ellipsis. I explain the fundamental mechanism behind the behaviour of intersentential ellipsis by using the concept of markedness.

This account also helps to resolve referent identification of the ellipted genitive, which further relates to that of the reflexive pronoun. Although referent identification of the genitive and the reflexive pronoun would not seem at first sight to belong to this chapter on the discourse devices, the discourse devices in fact do explain the mechanism by which they work, and hence it will be addressed later in this chapter. The inclusion of the genitive and the reflexive pronoun will make the algorithm and the text analysis in the final part of this thesis more comprehensive.

6.1  **The basic mechanism of referent identification**

Since Japanese sentences are structured in such a way that a topicalised argument, predominantly subject, is most prone to ellipsis by the sentence devices, the distinction between *wa* and *ga*, which mark the majority of subjects, holds the major key to ellipsis resolution. Non-subject ellipses occur much less frequently than subject ellipses, but they do occur; the issue of non-subject ellipses is discussed separately in the next section.
The basic mechanism for determining the referential identity of argument ellipsis is that an ellipted argument, predominantly subject, is the same as the previous topicalised *wa*-marked argument. This continues until a new *wa*-marked referent is introduced. Appearance of *ga*-marked referents can only temporarily interrupt this interpretation and generally has no bearing on referential identity of ellipted arguments. This is because the scope of the topic/discourse marker *wa* carries over into subsequent sentences, where further ellipted arguments are interpreted as coreferential with the initial *wa*-marked referent, until a new topic is introduced, again in the form of a *wa*-marked argument. This sequence may be interrupted by a different subject marked by *ga*, but this does not affect the interpretation of ellipted arguments, except in some complex sentences explained below. *Ga* is the nominative marker, and has a limited scope only within the clause, so that the next ellipted argument is coreferential, not with the *ga*-marked argument, but with the preceding *wa*-marked argument.

This basic mechanism of argument ellipsis, which I shall call 'Sustained topic', is illustrated as follows:

<table>
<thead>
<tr>
<th>Sustained topic structure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The referent of ellipsis is the nearest previous <em>wa</em>-marked argument:</td>
</tr>
<tr>
<td>'X-<em>wa</em> ... . <em>ga</em> ... .'</td>
</tr>
</tbody>
</table>

**Figure 18: The basic mechanism of referent identification**

We first observe the core structures of sentences in order to understand the basic mechanism, whereafter examples are presented for substantiation.

Even when there is a *ga*-marked subject before the ellipsis, the ellipsis is coreferential not with the *ga*-marked subject, but with the preceding *wa*-marked argument, namely:

'X-*wa* ... . Y-*ga* ... . *ga* ... .'

The scope of the *wa*-marked X continues until a new topic Z is introduced. Thereafter, the ellipsis is coreferential with the new topic Z:
Watanabe (1989:154 in footnote 1) notes an analogous conceptualisation within the framework of Topic continuity, which supports my claim:

- **Wa** marks cataphoric local discontinuity, and anaphoric local continuity.
- **Ga** marks cataphoric local discontinuity, and anaphoric local discontinuity.
- Ellipsis marks cataphoric local continuity, and anaphoric local continuity.

Watanabe's observation can be transformed to the following illustration:

<table>
<thead>
<tr>
<th>&lt;-- cataphoric relation</th>
<th>anaphoric relation --</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS</td>
<td>wa</td>
</tr>
<tr>
<td>DS</td>
<td>ga</td>
</tr>
<tr>
<td>SS</td>
<td>Ø</td>
</tr>
</tbody>
</table>

**Figure 19:** *Wa, ga, and ellipsis in relation to continuity of referent*

If a sentence is a complex sentence, some additional factors must be considered. Although complex sentences are not dealt with under the topic of the discourse devices that is the focus of this chapter, the elements in complex sentences must also be incorporated into the basic mechanism, in order to make the description of the basic mechanism of ellipsis resolution more comprehensive. §3.5 discussed the correlation between structures involving *wa* and *ga* and the SS/DS prediction summarised by the following table. (Square brackets denote subordinate clauses.

**Table 13.2:** *Correlation of structure of *wa/ga* and DS/SS*

<table>
<thead>
<tr>
<th>S(i)</th>
<th>[Øi ... ,] Y_i-wa ... , SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>S(ii) [Y_i-wa</td>
<td>[Øi ... ,] ... , SS</td>
</tr>
<tr>
<td>S(iii) X_j-ga</td>
<td>[Øj ... ,] DS &gt; (SS)</td>
</tr>
<tr>
<td>S(iv) [Øj ... ,] Y_j-ga ... , DS &gt;</td>
<td></td>
</tr>
<tr>
<td>(SS) [Ø ... ,] Ø ... , SS &gt;</td>
<td></td>
</tr>
</tbody>
</table>

**DS**
The above correlation between \( wa/ga \) and SS/DS interpretation in complex sentences is also explainable in terms of the basic mechanism - the referent of ellipsis is the nearest previous \( wa \)-marked argument. Hence, when no \( wa \)-marked subject is found within the complex sentence, ellipsis is coreferential with the \( wa \)-marked subject in the previous sentence; namely, the \( ga \)-marked referent has no bearing on ellipsis resolution, and hence the basic mechanism needs to be followed. There are basically three such structures:

\[
\text{S(iii) 'X-wa \ldots [ Y-ga \ldots ] \emptyset \ldots.'}
\]

or

\[
\text{S(iv) 'X-wa \ldots [ \emptyset_X \ldots ] Y-ga \ldots.'}
\]

or

\[
\text{S(vi) 'X-wa \ldots [ \emptyset_X \ldots ] \emptyset \ldots.'}
\]

In complex sentences, however, the following two cases of exceptions must be allowed to the basic mechanism:

**[Rule 1]** The case of cataphora. Under S(i) in Table 13.2, the ellipted slot appears before its referent, the \( wa \)-marked subject. Statistically, as seen in §3.5, cataphora S(i) comprises only 13% of the examples that are complex sentences in the corpus (PHP), and the preposed structure S(ii), i.e. with anaphora, is much more common at 87%.

\[
[\emptyset_X \ldots ] X-wa \ldots .' \quad \text{(cataphora; 13%)}
\]

or

\[
'X-wa [ \emptyset_X \ldots ] \ldots .' \quad \text{(anaphora; 87%)}
\]

**[Rule 2]** The case of ellipsis being coreferential with a \( ga \)-marked referent. As discussed in §3.5, this is a marked interpretation that overrides S(iii) and S(iv), and comprises a mere 1%. Although the default reading under S(iii) and S(iv) is DS, when the two predicates are treated as a mono-clause, they can signal a SS reading. Complex sentences are treated as a mono-clause (indicated by \{ ... \}), when the two clauses are conjoined by, for example, a SS conjunctive particle and/or have no signal (e.g. comma and pause) to separate the two predicates, and possibly have signal after \( X-ga \) in S(iii). These structures are similar to clause-chaining or serial constructions. This is illustrated below:
We must also consider cases where a sentence contains more than two clauses and when two joined clauses are both subordinate clauses. These cases are particularly relevant to Rule 2. This is due to the Japanese constraint that the subject in a subordinate clause is not generally marked by wa, as was discussed in §3.5.3.2. For example, the sentence below consists of three clauses, as numbered on the right. Clauses 1 and 2 have coreferential subjects, so one might expect X to be marked by wa instead of ga, but X is marked by ga, because it is not the subject of the matrix clause in the sentence. More often than not, such clauses are conjoined by a SS particle, which leads to SS reading anyway, despite the ga marking:

\[
\text{SS: } \{[X-\text{ga } \ldots \text{ SS particle } / \text{ no signal}], \ Y-\text{ga } \ldots \ \} \\
\{[\varnothing_2 \ldots \text{ SS particle } / \text{ no signal}], \ Y-\text{ga } \ldots \ \} \\
\]

The basic mechanism of ellipsis resolution including complex sentences is exemplified in essence (i.e. only showing the subjects) as in the following contrived structure of a hypothetical sentence:

\[
\begin{array}{l}
X-\text{wa } \ldots \ . \ \ \varnothing_1x \ldots , \{[Y-\text{ga } \ldots \text{ SS particle }], \ O_2y \ldots \ . \} \\
[\varnothing_3x \ldots , I Z-\text{ga } \ldots \ . \ \ O_4x \ldots \ A-\text{wa } \ldots \ . \} \\
\varnothing_5A \ldots \ . \ \ \ (\text{new topic})
\end{array}
\]

Ellipsis \(\varnothing_1\) is coreferential with the nearest previous wa-marked argument X, following the basic mechanism; \(\varnothing_2\) is coreferential with Y by Rule 2; \(\varnothing_3\) with X by the basic mechanism (note that the scope of Y does not extend beyond the sentence in which Y appears, so that \(\varnothing_3\) is not coreferential with Y); \(\varnothing_4\) with X by the basic mechanism, because the previous overt subjects are marked by ga; and \(\varnothing_5\) with A, which is a new topic introduced just before \(\varnothing_5\).

The mechanisms discussed above are exemplified in (1):

(1) 太郎は忙しい。明日日本に行くからだ。
ガールフレンドが夕食に誘ったのに、断った。おみやげを買いに行くからだ。
次郎は太郎をうらやましがっている。行きたくても行けないからだ。

Taro-wa isogashii. Ashita o1i nihon ni iku kara da.
-Gaarufurendo-ga o2i yuushoku ni sasotta noni, o3i kotowatta.
-Jiro-wa Taro-o urayamashi gatteiru. o5k Iki taku temo, o6k ik-e nai kara da.
-Taroi-wa isogashii. Ashita o1i nihon ni iku kara da.

(1a) summarises the essential elements of overt and ellipted arguments in (1), to
demonstrate the mechanism of ellipsis resolution.

Ellipses o1, o2, o3, and o4 are coreferential with 'i', the nearest previous wa-marked argument, following the basic mechanism; and o5 and o6 with 'k', which is a new topic introduced just before o5. Although this text has been constructed, the basic mechanism is substantiated extensively in §7.2 using natural texts for verification.

Note that ellipsis o2 is different from the other ellipses, in that its grammatical relation is the object, while all the others are the subject. Consideration of non-subject ellipsis is the topic of the next section.

6.2 Non-subject ellipsis

The grammatical relations are generally held constant between the referent and any coreferential ellipsis (Kameyama 1986 on the property sharing constraint, see §2.5.2.4). Consequently, ellipted subjects are usually coreferential with referents that are subject. However, it is also possible for the grammatical relation of the ellipsis to be different from that of the overt antecedent. The ellipsis o2 in (1),...
despite being an object, is coreferential with Taro, the nearest previous wa-marked subject. This means that regardless of the grammatical relation of ellipsis, the basic mechanism of sustained topic structure holds in identifying the referent of ellipsis.

Note that object ellipsis such as ø2 is infrequent and represents a case of overriding the principle of ellipsis, because the principle of ellipsis makes the subject more prone to ellipsis than the object. The object ellipsis ø2 was induced by the focused referent gaarufurendo 'Taro's girlfriend' which was made into the subject with the implication that '(Even though) his girlfriend asked him out for dinner, (Taro was too busy to spare time).' (see §4.10.1). As seen in Table 21 in §5.4 and repeated here for convenience, statistically, such a structure was found in only 1.9% of the time in the corpus ('PHP' and 'Japanese society: An update').

Table 21: Proportion of argument ellipsis

<table>
<thead>
<tr>
<th>ellipsis type</th>
<th>proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject ellipsis</td>
<td>93.5%</td>
</tr>
<tr>
<td>Non-subject ellipsis</td>
<td>6.5%</td>
</tr>
<tr>
<td>(with SB ellipsis)</td>
<td>4.6%</td>
</tr>
<tr>
<td>(without SB ellipsis)</td>
<td>1.9%</td>
</tr>
<tr>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

Thus, the basic mechanism of sustained topic structure adequately accounts for anomalous cases, such as the object ellipsis ø2 in (1), which occurred due to the focusing of the subject. However, clauses can have more than one ellipsis, i.e. there are cases of multiple ellipses where the subject and non-subject are ellipted within the same clause having the structure [ø ø V], as discussed in §5.4. These multiple argument ellipses require an additional mechanism for referent identification. These ellipses are not coreferential, otherwise one of them would be expressed using the reflexive pronoun (see §6.4.4). Hence, one wa-marked referent cannot be the referent of both ellipses. For example, in (2) the third clause has two ellipses - the subject and the object - and the wa-marked referent cannot be the referent for both:

(2) なぜかというと、私は剛のファンで、剛がマラソンに挑戦するので応援したかったからだ。

_Nazekato iu to, watashiwa Goo-no fan de,_
'The reason is, I'm a fan of Goo, and because Goo was challenging the marathon, (I) wanted to cheer for (him).'

(Jinken 2.1999)

The interpretation of (2) is that the ellipted subject is coreferential with the wa-marked referent, coindexed as 'a', and the ellipted object is coreferential with the ga-marked referent, coindexed as 'c'.

Here, the simple solution, stating that a subject ellipsis is coreferential with the subject referent in the sentence or in the previous sentence, and an object ellipsis with the object referent, does not work, as it fails in (2) as well as for ø 2 in (1). As a solution to this problem, the next section introduces the notion of 'Salient referent list' to retrieve the referential identity of non-subject ellipses including as multiple argument ellipses. Since non-subjects are distributionally complementary to the subjects, the additional mechanism is grounded in the basic mechanism, so that the basic mechanism still constitutes the basis of mechanisms for ellipsis resolution.

### 6.3 Salient referent list

In texts, each sentence contains one or more referents, and the subsequent sentences may retain one or more of those referents, some or all of which may be expressed by ellipses, and which may also introduce one or more new referents. When processing sentences addressees store new referents by incorporating them into a pool of old referents from the previous sentences which have already been stored in their cognition, and repeat this process as they process each new sentence. The salient referent list does just that. It is like a memory bank in a cognitive sense, listing overt arguments appearing in the sentence by incorporating arguments that have appeared in the previous sentences. It is this input information which provides cues to determining the referential identity of ellipted arguments in the sentence, not only for subject ellipsis but also for non-subject ellipses.
The salient referent list basically lists all overt human/animate arguments and the overt subject, object, and topicalised inanimate arguments which have appeared up to the sentence in question. The reason why not all inanimate arguments are listed is because inanimate arguments typically have a very low discourse salience, so that they are unlikely to be referred to again in the next sentence, unless they are topicalised. My examination of texts shows that when inanimate arguments are referred to again even within the sentence or in the next sentence, they are unlikely to be ellipted, but instead are referred to by lexical NPs again (§2.5.1 and §7.2.1). For example, the inanimate argument *yume* 'dream' appears twice in the following example within the same sentence; the second mention is repeated instead of being ellipted or pronominalised.

(3) 特に、障害をもつ人たちが、自分の夢に挑戦し、あきらめないで努力して夢を実現していく姿がとてもに残った。

'Specially, (I) was impressed with the scene that people with disability challenged their dreams, (they) tried hard without giving up, and (they) made their dreams come true.'

(Joinen 2.1999.)

Those required overt arguments are listed in a hierarchical order of salience in terms of the person/animacy hierarchy and discourse salience, that is to say, in terms of the grammatical relations, because of the way in which Japanese sentences are structured to place an argument high on the person/animacy hierarchy and discourse salience in the subject slot by following the principle of direct alignment. They are listed according to the following hierarchy, called the 'Salient referent order list', which accords the topicalised subject the highest saliency. The topicalised subject is typically a referential human argument, and the saliency goes down as an argument goes down in the list, i.e. typically a low referential inanimate argument.
Chapter 6

Figure 20: Salient referent order list

The order in the salient referent list was adapted from the Japanese version of Expected Center Order in Centering Theory proposed by Kameyama (1985) (see §2.5.2.2). It also resembles Keenan and Comrie’s (1977) noun accessibility hierarchy, Givon’s (1979) topicality hierarchy, and Kuno’s (1987) thematic hierarchy. Each argument listed in the salient referent list is provided with the following information: its grammatical relation and topicality, person/animacy, and semantic attributes, and when applicable, the value for the in-group/out-group distinction (see §3.2.1.1).1 The latter information is optional, because not every sentence carries it. Note that thematic roles are not relevant information for ellipsis resolution in Japanese under this method. As explained in Chapter 5, ellipsis is targeted at the grammatical subject (except for low-transitive sentences), but is insensitive to the thematic role.

A salient referent list is created for each new sentence by modifying the one from the preceding sentence. If an argument appears with an identical grammatical relation to another argument already existing in the list, for example, a topic subject exists and a new topic subject appears, the new topic subject takes its place for reasons of recency. As seen in §6.1, ellipses are coreferential with the previous wa-

---

1 For simplicity, in this thesis semantic attributes are noted only for those arguments which require them for referent identification. However, in practice, detailed semantic attributes of all listed arguments except for first and second person are noted in the salient referent list. As discussed in §3.1.3, the ‘Goi Taikei’ Valency Dictionary can distinguish 2700 types of semantic attributes for common nouns and 130 types of proper nouns on the basis of the verbal predicate. This information will further improve the accuracy of referent identification. It is particularly vital for expository type genres where the person/animacy hierarchy does not play a major role, i.e. with few human arguments, and instead more inanimate arguments, such as abstract concepts. However, the implementation of the Goi taikei Valency dictionary is beyond manual application, which this thesis is restricted to.

Other pieces of information may help to identify ellipses appearing in more complex sentences, although they are not necessary for the texts used in this thesis. For example, information on number (singular is unmarked), and whether or not an argument is accompanied by a relative clause, will increase the specificity and identifiability of the argument.
marked argument until a new *wa*-marked argument appears, and thereafter ellipses are coreferential with the most immediate previous *wa*-marked argument.

A salient referent list is like a short term memory bank listing the most activated / recent referents with high saliency, in which the topic referent is often referred to as 'local topic'. Old topic referents are not discarded completely. Rather, the most recent old topic referent is sent to a medium term memory bank, so to speak, which may be activated again when it is needed to process the next sentence. This mechanism is incorporated in the make-up of the algorithm (Step 9-2 in the algorithm in §7.1), and is vital for referent identification of so called 'undercoded sentences' (see §7.2.3).

### 6.3.1 Creating salient referent lists

To summarise how salient referent lists are created, we list all overt human arguments and the overt subject, object, and topicalised inanimate arguments that appear in the sentence, by following the salience referent order list, together with the description of relevant information on the arguments. If it is not the first sentence in the text, we update the list by incorporating the salient referent list for the previous sentence. The creation of salient referent lists involves other minor elements. In order to see more fully how salient referent lists are created, observe the following using a fragment of the text (*Jinken*, 1999.2) which will be used in the text analysis in §7.2.1. The following sentence is the first sentence in the text, noted as [s1]. Each set of square brackets denotes a clause, except for a matrix clause. Explanations other than those used to create the salient referent list will be deferred to §7.2 in the discussion of text analysis.

Note that in this thesis *wa*-marked arguments are parsed as part of the closest clause in which they appear, i.e. the subordinate clause, although syntactically, it belongs to the matrix clause. That is to say, such sentences are parsed as [X-\(wa\)]...

---

2 In this thesis, only the topic appearing immediately prior to the sentence in question can be recalled, because this is sufficient to process the texts discussed in §7.2. However, for other types of texts, one may need to expand to two previous sentences. This is left for future study.
Chapter 6

[øx ... , instead of the more conventional parsing X-wa [øx ... ] ... , except in two cases. One is when the wa-marked argument is different from the immediately following clause, i.e. X-wa [Y-ga ... ] ... . The other is where the sentence has complement clauses and relative clauses, i.e. when other clauses are embedded in the matrix clause, for example, X-wa [øx/Y-ga ... ]comp/rc ... . The rationale behind this treatment is that although theoretically and syntactically a wa-marked argument may be treated as being preposed from the matrix clause, because the matrix clause appears as the final clause in the sentence whereas the topic appears first, in reality in processing sentences, particularly for sentences with a number of clauses where the wa-marked argument is separated from its predicate by a number of clauses in the middle, it is more realistic and intuitive to assume that clauses are processed as they come, due to the constraints from short term memory. This treatment provides the same reading as the syntactically parsed model, since elliplted arguments are coreferential with wa-marked arguments within the same sentence in any case (§6.1). The application of this treatment is seen in [s1], [s2], and [s6].

Now, here is the first sentence.

(4) [s1]

私は先週の土曜日ほとんど寝ないでテレビを見続けた。

(Watashi -wa senshuu no doyoobi hotondo ne nai de] ø a terebi-o mi tsuzuketa.
1sg-TopSB last week of Saturday hardly sleep Neg and[SS] SB TV-OB watch continued
'Last Saturday, Ia hardly slept, instead (Ia) kept on watching TV.'

In [s1], there is only one human argument, namely, the topicalised subject watashi, and one inanimate object, terebi. Hence, the salient referent list for [s1] is formulated as follows:

Salient referent list: [s1] {T1a: watashi (TopSB; first person) >
T2b: terebi (OB; inanimate)}

3 Of course, in machine processing, the parsing does not need to be intuitive and machine has no problem of short term memory, so that it is possible, in fact more consistent with the rest of analysis, to parse wa-marked arguments as part of the matrix clause.
Each listed argument is given a number, for example, 'T1'. The argument under T1 has the highest saliency and is therefore the best candidate as referent for an ellipsis; T2 is the next highest, and so forth. The subscript after T1, for example T1a, is the identity of the argument which is also coindexed in the text for easy recognition. Then, the actual word is noted with the required information of that argument. The same goes for T2, T3, and so on. In [s1], there are only T1 and T2, as shown above.

The salient referent list needs to be updated with each new sentence, so each salient referent list is numbered. This sentence is noted as Salient referent list [s1], and the next sentence is noted as Salient referent list [s2].

The second sentence is as follows:

(5) [s2]
なぜかということと、私は剛のファンで、剛がマラソンに挑戦するので、応援したかったからだ。
Nazekato iu to, [watashi-a-wa Goo,-no fan de,] why say if 1sg-TopSB -Gen fan Cop-and, [Goo-ga marason-ni chooensuru node, ] ø ø ø ooen shitakatta] kara da.
-SB marathon-Obl challenge because SB OB cheer wanted because Cop
'The reason is, I'm a fan of Goo, and because Goo was challenging the marathon, (Ia) wanted to cheer for (himc).'

In [s2], there are two overt human arguments (watashi_a and Goo_c) and no inanimate argument. The referent 'a' appears again with the same function of topicalised subject, so it remains as T1 in the list. The other human argument, indexed as 'c', is the subject, so that it is listed as T2. There is no inanimate argument in [s2], so that the inanimate object argument terebi_b from the previous salient referent list is carried over to the salient referent list for [s2], but this time as T3, because the object is listed lower than the subject in the salient referent order list. Hence, the salient referent list for [s2] is formulated as follows with the required information of the arguments:

Salient referent list: [s2]  {T1_a: watashi (TopSB; first person) >
T2_c: Goo (SB; third person) >
T3_b: terebi (OB; inanimate)}

Note that salient referent lists include not only the referents appearing in the current sentence in question, but also the referents which are cognitively active in
addressees' mind, i.e. the referents from the previous sentences, as exemplified by the inclusion of T3 *terebi* in Salient referent list [s2].

The third sentence [s3] is:

(6) [s3]
その中でたくさんの感動する場面を見た。
\(\theta_a\) *Sono nakade takusanno kandosuru bamen\(_d\)-o mita.*
there inside many moving scene-OB saw
'There (I\(_a\)) saw a number of moving scenes.'

[s3] has only one overt argument: *bamen\(_d\)*, an inanimate object argument.

We carry over the salient referent list [s2], except this object argument 'd' from [s3] replaces the object argument in the salient referent list [s2] for reasons of recency.\(^4\)

Hence, the salient referent list [s3] is created as follows:

Salient referent list: [s3]  \{T1\(_a\): *watashi* (TopSB; first person) > T2\(_c\): *Goo* (SB; third person) > T3\(_d\): *bamen* (OB; inanimate)\}

I present one more sentence to demonstrate the creation of the salient referent list, because this fourth sentence involves elements which have not appeared so far.

(7) [s4]
特に、障害をもつ人たちが、自分の夢に挑戦し、あきらめないで努力して夢を実現していく姿がとても心に残った。
\(\theta_a\) *Tokuni, [[*\(\theta_e\) shoogat\(_z\)-o motsu\]rcSB *hito-tachi\(_e\)-ga, jibun\(_E\)-no yume-ni choosenshi-\(\theta_c\)]
特殊 SB disability-OB have person-pl-SB self-Gen dream-Obl challenge-and[SS]
[akirame nai de \(\theta_e\) doryokushi te,] [\(\theta_e\) \(\theta_e\) yume-\(\theta_e\)-o fitugenshi-teiku]\rcOB give up Neg with SB effort and[SS] SB Gen dream-OB fruition-Imp
sugata-ga \(\theta_a\) totemo kokoro-ni nokottaLT.
scene-NomOB SB very much mind-Loc left
'Specially, (I) was impressed with the scene that people with disability challenged their dreams, (they) tried hard without giving up, and (they) made (their) dreams come true.'

---

\(^4\) Under this system, only one argument is listed under any one grammatical relation, and this works satisfactory in the text analysis in §7.2. See footnote 5 for further notes.
'Sugata-ga' in the last clause is a nominative object, even though it is marked by the nominative marker. This is because the verbal semantics of the clause takes a low-transitive clause, noted by a subscript 'LT'. It selects a nominative object and the topicalised subject, and comprises the structure [(SB-wa) OB-ga Verbal predicate], as discussed in §4.6.1. This means that the sentence is considered to have an ellipted topicalised subject whose referent has to be identified.5

In making the salient referent list [s4], since there is no topicalised subject in [s4], we carry over the topicalised subject as T1 from the salient referent list [s3]. [s4] has two inanimate objects (shoogai-z-o and yume-t-o) and one human non-topicalised subject hito-tachi expressed overtly. The last referent is accompanied by a relative clause, noted by rcSB, which means a relative clause modifying a subject. Since the two inanimate objects have the same grammatical relation and equal values for the person/animacy and discourse salience, we add the latter object to the list for reasons of recency, replacing the older object from the salient referent list [s3].6 Similarly, we take the human subject argument hito-tachi as T2, replacing the subject from the salient referent list [s3]. Thus, the salient referent list [s4] is created as follows:

Salient referent list: [s4] {T1: watashi (TopSB; first person) >
T2: hito-tachi (SB; third person) >
T3: yume (OB; inanimate)}

Thus, a salient referent list carries a list of salient referents, including relevant referents from the previous sentences, on the basis of which we identify the referents

---

5 Some, particularly traditional Japanese grammarians, may object to the underlying structure with the assumption for the existence of subject. As mentioned in §1.4, when arguments required in English are absent in Japanese, they are regarded as ellipses in this thesis.

6 Salient referent lists only list one argument under any one grammatical relation for simplicity. This treatment did not cause any trouble, i.e. did not make a wrong selection etc, in the text analysis in §7.2 (except perhaps for [s7]). However, this is an area which needs to be further investigated in more texts and larger texts. Cognitively speaking, in my view, all overt referents are activated at least until the next sentence has been processed, and the question of how long they are kept depends upon a number of issues, such as topic, the importance of the discourse to the addressees, and the individual capacity of memory.
for ellipses in the sentence. This salient referent list constitutes the key concept in the algorithm introduced in §7.1.

6.3.2 Resolution of multiple argument ellipses in one clause

Having explained the notion of salient referent list, I am now in a position to explain how the referential identity of non-subject ellipses is determined. We saw earlier that [s2] has multiple ellipses in the third clause: the subject and the object. The text and the salient referent list for [s2] are repeated here for convenience.

(5) [s2] なぜかというと、私は剛のファンで、剛がマラソンに挑戦するので、応援したかったからだ。

Naze-kato iu to, [[watashi-a-wa Goo-c-no fan de.]]
why say if 1sg-TopSB -Gen fan Cop-and,
[Goo-c-ga marason-ni choosensuru node,] 2 ø ø ooen shitakatta] kara
daa.
-SB marathon-Obl challenge because SB OB cheer wanted because Cop
'The reason is, I'm a fan of Goo, and because Goo was challenging the marathon, (I) wanted to cheer for (him).'

Salient referent list: [s2]  {T1a: watashi (TopSB; first person) >
  T2c: Goo (SB; third person) >
  T3b: terebi (OB; inanimate)}

The multiple ellipses are also ranked by the same salient referent order list, so that the subject ellipsis is ranked higher than the object ellipsis. The mechanism of referential identification of multiple ellipses works as follows - the T1 argument in the salient referent list is chosen to be the referent for the highest ranked ellipsis in terms of the salient referent order list. Similarly, T2 is selected as the referent for the next highest ellipsis, T3 is for the next highest ellipsis, and so forth. For example, in [s2], the subject ellipsis is ranked higher than the object ellipsis, so that T1 'a' is the referent of the subject ellipsis, and T2 'c' is the referent of the object ellipsis. This interpretation, following the mechanism, correctly selects the referents for the multiple ellipses. Note that the grammatical relations of the referent and the ellipsis need not be shared, as discussed in §6.2. This mechanism is further substantiated in text analysis §7.2.
6.4 Ellipsis as unmarked representation of sameness

What I have been calling 'sustained topic structure', which is the basic mechanism that interprets an ellipted argument as the same as the previous \textit{wa}-marked argument, is an adaptation of the concept of markedness. In this section, I point out the elements in markedness which are relevant to and have led me to formulate the basic mechanism. Then I will show how the sustained topic structure can also explain referent identification of the ellipted genitive, which then relates to referent identification of the reflexive pronoun. Although the discourse devices may not appear appropriate for dealing with referent identification of the genitive and the reflexive pronoun, I will show that the sustained topic structure for the discourse devices also accounts for these cases.

6.4.1 Markedness reviewed

The general notion of markedness is a type of asymmetry which can account for irregularities in linguistic patterns (Croft 1990:64).\footnote{This represents a privative relation of markedness, and this is the main concern for this thesis. The more general concept of markedness includes an 'equipollent' relation which captures symmetrical relation (i.e. oppositions with equal values) (Comrie 1976). For example, in tense systems, present tense is generally no more marked or unmarked than future or past (i.e. equipollent), though in many languages, one is more marked: past and non-past, future and non-future (i.e. privative) (Comrie 1985).} The concept of markedness is said to have first been introduced as such in Prague School phonology, though the idea goes back well into the 19th century (Croft 1990:64, Trask 1993:167, Crystal 1997:233). The notion of 'marked' and 'unmarked' values of a category was first developed for phonological systems by Nikolaj Trubetzkoy and was first applied to morphosyntactic categories and semantics by Roman Jakobson (Croft 1990:64). It is now one of the most fundamental concepts used in various areas of linguistic theory, but its diverse domain of application can be classified into the following two types of markedness relation:

[1] Dichotomous relation

presence (i.e. literally 'marked') or absence (i.e. literally 'unmarked') of morphemes or features
There are clear differences between the two types. [1] captures phonological phenomena (e.g. voiced/voiceless oppositions) and morphological phenomena (e.g. singular/plural oppositions) representing a dichotomous relation of markedness. On the other hand, [2] is generally used for semantic, syntactic and statistical asymmetries: choice of lexical items and syntactic structures, natural or frequent usage, and grammaticality judgements of sentences, which involve a gradient relation, i.e. degree of markedness.

Although the two types differ significantly, a correlation between them is evident with respect to form and frequency. 'Unmarked' correlates with the use of zero form to represent common and frequent expressions, while 'marked' correlates with additional marking to represent therms that are uncommon, marginally acceptable, unnatural, less expected, infrequent/rare, more limited in distribution, or greater in semantic specificity (Comrie 1976, Croft 1990, Trask 1993, Crystal 1997). Furthermore, this correlation has an economic motivation (Haiman 1985). The most frequent grammatical value in a series has zero or minimal expression cross-linguistically, because people tend to shorten the linguistic expressions that are used most commonly (Greenberg 1966:65-69, Croft 1990:156). In the converse case, as Greenberg (1966:65) states, because it is uncommon, it has to be marked.

This makes good sense also from the point of view of anaphora, in that those constituents which are inferable (i.e. expected) tend to be reduced in form, so that pronouns or ellipsis are used instead of repeating the full lexical item (Levinson 1987, 1991, see §2.4.1), which is certainly economical. On the other hand, if elements are not easily inferable or can be ambiguous, they tend to be marked, i.e. not be reduced in form (Fox 1996). Van Valin (1987:513) has put the view that anaphora has universal implications by stating that no human language sets out its grammar so as to repeat a NP to refer to the same referent. The study of topic continuity led by Givón (ed. 1983) also provided supporting evidence for this view. This examined a number of languages, including Japanese, and concluded that the recency of last
mention associated with topic determines the form of anaphor; namely, recently mentioned high topic referents tend to be coded by reduced forms (pronoun, or ellipsis in the case of Japanese), because they are more inferable therefore expected, whereas low topic referents which are mentioned not so recently tend to be coded by full NPs.

6.4.2 Corollary of markedness

The following corollary of markedness can be drawn from both principal types of markedness:

[3] Ellipsis is the unmarked representation of 'sameness' of denotation

This works on the basic principle - mark (i.e. mention) if different from the previous mention, or else don't mark (i.e. elide) if same as the previous mention.

In this thesis, the corollary of markedness is most applicable to subjects, though it is applicable to all nominal arguments and is also vital in explaining referent identification of the genitive (discussed in §6.4.3). We can see from a number of phenomena why the corollary of markedness is most applicable to subjects among nominal arguments, a fact demonstrated by the considerable proneness of subjects to ellipsis under referential identity. Overtly or covertly, subjects are contained in sentences much more frequently than non-subjects are. Given the universal implications discussed earlier (the most frequent grammatical value has zero or minimal expression typologically), it is a natural consequence that nominal ellipses should mostly be subjects. The principle of ellipsis correctly captures this phenomenon. This has also been shown statistically; Table 21 in §5.4 showed that 93.5% of argument ellipses are subjects. Furthermore, cross-linguistically, information tends to be skewed towards maintaining the same subject/topic rather than constantly introducing a new or different subject/topic (Hopper and Thompson 1980, Givón 1983). This is a consequence of the need to maintain discourse coherence and discourse economy (Haiman 1985). The skewed tendency is statistically evident for complex sentences in Japanese and English, in that the
proportion of SS (same subject) structures in complex sentences is 65% for Japanese written narrative texts, as seen in §3.5 2.2 and 68% for Japanese school textbooks (Watanabe 1994). These figures are strikingly similar to the figure for English at 65.8% reported in Kameyama (1998) using the Brown Corpus. Thus, the above corollary of markedness most frequently results in 'ellipsis as the unmarked representation of same subject'.

In a sense, it parallels the obviation principle describing the general phenomenon of control discussed in Simpson and Bresnan (1983) which states that the interpretation of unexpressed arguments in syntactically dependent clauses is restricted by the interpretation of the arguments in the main clause. That is to say, an unexpressed subject signifies the same as the matrix subject, while an overt subject signifies a different subject from the matrix subject. This is observed, for example, in Equi-NP deletion, as in (8a) and (8b), and in the deletion of NPs in gerundial clauses, as in (9a) and (9b):

(8a) \( I \text{ want } \emptyset \text{ to understand. } \) [SS: \( \emptyset = I \)]
(8b) \( I \text{ want him to understand. } \) [DS: him \( \neq I \)]
(9a) \( \emptyset \text{ Having bought a house, he is happy. } \) [SS: \( \emptyset = he \)]
(9b) Tom having bought a house, his wife is happy. [DS: Tom \( \neq \) his wife]

However, the main difference between the obviation principle and the above corollary of markedness is that the former only accounts for intrasentential ellipsis, whereas the latter accounts for intersentential ellipsis as well as intrasentential ellipsis. 8

6.4.3 Genitives

8 The explanations using the concept of markedness, i.e. the three types of markedness, not only provide a unified account for the complex phenomena of ellipsis, as shown in the text, but also adequately account for anomalous uses of ellipsis which are problematic in syntax (see Nariyama 2000). For example, when the verb in the subordinate clause is private or personal, as in the example below, the ellipted subject has a strong connotation to refer to a first person irrespective of the type of subject, because it is natural and expected to be so. Consequently, it can be different from the matrix subject.

\( \emptyset \text{ Looking back at it now, John was wrong. } \) [DS: \( \emptyset = I \)]

Since the act of ‘looking back’ is personal, the zero subject can only be the speaker (i.e. 1/ *2/ *3), and cannot be coreferential with the overt matrix subject which is a third person.
The corollary of markedness - that ellipsis is the unmarked representation of 'sameness' of denotation (i.e. reference) - also explains the patterns of ellipted genitives. That is to say, zero (i.e. unspecified) genitive, signals, roughly without consideration to the detailed behaviour of the genitive,\(^9\) that the possessor is the same as the subject referent. This statement is supported by a number of studies in the literature. The subject in predicative possession is semantically the same as the possessor in attributive possession (Heine 1997:183). In LFG (§2.5.2.1), a possessive NP is given a clausal status, i.e. the possessor in a possessive NP parallels the subject in a clause. The nominative marker \(ga\) in Japanese originated in the genitive (§1.7.2.). Today, the \(ga\) (the nominative) / \(no\) (the genitive) conversion still occurs, for example, \(watashi-ga/no\ katta hon\ 'the book I bought' (see e.g. Shibatani 1990, Fujii 1991).

The genitive that is required in the English translation is often unspecified in Japanese. As shown in (10a), the possessor of the car is unspecified, but the car which Taro sold is understood as belonging to Taro (the subject) or at least as something to do with Taro (e.g. if Taro is a car dealer). On the other hand, specification (i.e. marking) of the genitive, as in (10b), is used when the genitive referent is not coreferential with the subject.

\begin{itemize}
\item[(10a)] 太郎は車を売った。
\textit{Taro}-wa \(\ø\) kuruma-o \textit{utta}.
\"Taro sold (his) car.\"
\item[(10b)] 太郎は次郎の車を売った。
\textit{Taro}-wa \textit{Jiro}-no kuruma-o \textit{utta}.
\"Taro sold Jiro's car.\"
\end{itemize}

The use of other possible arguments for the slot, such as pronoun as in (10c), namely, the specification of the genitive, results in disjoint reference in Japanese.

\begin{itemize}
\item[(10c)] 太郎は彼の車を売った。
\textit{Taro}-wa \textit{kare}-no kuruma-o \textit{utta}.
\end{itemize}

\(^9\) In this thesis, I address only the general behaviour of the genitive. For detailed discussion of the genitive in relation to its English counterpart, see Bond and Sussex (1999), and for a more general discussion of possession, see Heine (1997).
The above examples explicitly show the importance of the concept of markedness for referent identification; if the genitive argument is the same as the subject, do not mention it (i.e. leave it unmarked), which maintains discourse coherence and achieves economy. But where the genitive argument is different from the subject, because it is different, this has to be specified (i.e. mark it).

Analogously, genitive arguments which express inalienable possession, such as body parts, are often unspecified in Japanese (see Bond and Sussex 1999). Unspecified genitive arguments are understood to be coreferential with the subject, as in (11a), while the specification of the genitive appears when it is not coreferential with the subject, as in (11b).

(11a) 太郎は爪を切った。
*Taro_i -wa _ø_ tsume-o _kitta._
'Taro_i clipped (his) nails.'

(11b) 太郎は花子の爪を切った。
*Taro_i -wa Hanako-j -no tsume-o _kitta._
'Taro_i clipped Hanako's nails.'

Again, the use of a pronoun (11c), i.e. the specification of the genitive, results in disjoint reference in Japanese.

(11c) 太郎は彼の爪を切った。
*Taro_i -wa kare-j -no tsume-o _kitta._
'Taro_i clipped his own nails.'

Note, however, that while ellipsis necessarily signals sameness in the above examples, the reverse, i.e. the specification of an overt element bearing the genitive does not licence a disjoint reading in certain circumstances. The use of the reflexive pronoun, as in (11d), signals coreference despite its specification, which leads to the topic of the reflexive pronoun in the next subsection.

(11d) 太郎は自分の爪を切った。
*Taro_i -wa _jibun-no_j_ tsume-o _kitta._
'Taro_i clipped his own nails.'
6.4.4 The reflexive pronoun

Although the reflexive pronoun *jibun* is not a concern for this thesis, which examines ellipsis rather than overt nominals, I note below some aspects which are pertinent to ellipses of subjects and the genitive, particularly in view of the fact that since *jibun* does not reflect person, gender, and number (although number can be specified: *jibun-tachi* or *jibun-ra* for plural), the referential identity of *jibun* needs to be determined in order to conduct the text analysis in the next chapter more comprehensively and to be able to translate it into grammatical English. However, the issue of the reflexive pronoun is notorious for its complexity, so in this subsection, I address only what is of direct relevance to this chapter, accounting for the general behaviour of the reflexive pronoun.

The reflexive pronoun is bound by the subject (Kuno 1973, Shibatani 1990, inter alios, see §1.5.1.3, §2.4).\(^{10}\) For example, in (12a) the reflexive pronoun is coreferential, not with the object, but with the subject.

\[
\text{(12a) Taro wa Hanako o jibun no iie ni yonda.}
\]

Taro invited Hanako to his home.

That the reflexive pronoun is coreferential with the subject is a vital mechanism for referent identification. This mechanism is shared by that of ellipted subjects and the genitive, namely, the referent of the reflexive pronoun, ellipted subjects and the genitive is the subject.

This means that some sentences use the reflexive pronoun, as in (12a) and (13a), and others use ellipsis, as in (12b) and (13b), and yet they have the same logical content, though the use of the reflexive conveys special implications which are explained below:

---

\(^{10}\) It has been reported that non-subject can be the referent for the reflexive pronoun (McCawley 1976, Kameyama 1985). However, as shown in §2.5, I disagree with this claim, since the examples used as the substantiation for the claim are constructed sentences and unnatural. In addition, my observation of my corpus has found no example of the reflexive pronoun with a non-subject coreference, hence it would at best be extremely rare.
Chapter 6

(12a)  太郎は花子を自分の家によんだ。

\[ Taro_i\text{-wa} \quad Hanako_j\text{-o} \quad jibun\text{-no} \quad ie-ni \quad yonda. \]

-Top       -OB      -Gen  home-to

'\text{Taro}_i \text{ invited \text{ Hanako} to (his)} \text{ own home.}'

(12b)  太郎は花子を家によんだ。

\[ Taro_i\text{-wa} \quad Hanako_j\text{-o} \quad {a}_i\text{ ie-ni} \quad yonda. \]

-Top       -OB      home-to invited

'Taro \text{ i invited Hanako to (his) home.'

(13a)  太郎は自分がそれを注文したのに忘れている。

\[ Taro_i\text{-wa} \quad jibun\text{-ga} \quad sore\text{-o} \quad chuomonshita \quad noni, \quad wasureteiru. \]

-Top self-SB that-OB ordered although forget

'Although himself \text{ i has ordered it, Taroi forgot (it).}'

(13b)  太郎はそれを注文したのに忘れている。

\[ Taro_i\text{-wa} \quad {a}_i\text{ sore\text{-o} chuomonshita noni, wasureteiru.} \]

-Top that-OB ordered although forget

'Although (he \text{ i} has ordered it, \text{Taro} \text{ i forgot (it).}'

The use of \text{jibun} often denotes emphasis, as shown in the translation for (12a). In some cases, such as (13a), it connotes the speaker's perspective shift which cognitively treats the same referent differently (see Iwasaki 1993); namely, to treat the one who ordered differently from the other who forgot it. Because the two referents are cognitively different, they are both specified.

In order to make the observations here more comprehensive in preparation for the algorithm and text analysis in the next chapter, I focus my observation on the phenomena appearing in complex sentences. The referent of an ellipted genitive in a subordinate clause is the subject of that clause, and it is hard to obtain the readings where it is the subject of the matrix clause instead, as shown in (14a) and (15a) respectively:

Zero genitive:  coreferential with the subject of the same clause

(14a)  太郎は次郎が車を売った時、びっくりした。

\[ Taro_i\text{-wa} \quad Jiro_j\text{-ga} \quad {a}_i\text{ kuruma\text{-o} utta toki, bikkurishita.} \]

-Top       -SB      Gen  car-OB sold when

'surprised

'Taro \text{ was surprised when Jiro \text{ sold (his) car.'}

(15a)  太郎は次郎が爪を切るのを見ていた。

\[ Taro_i\text{-wa} \quad Jiro_j\text{-ga} \quad {a}_i\text{ tsume\text{-o} kiru no-o mi-tei-ta.} \]

-Top       -SB Gen nail-OB cut Nomz-OB look-

Impf-Past
'Taro was looking at Jiro clipping (his) nails.'

Of course, if the complex sentences have the same subject, the subject in a subordinate clause is naturally the same as the matrix subject, as shown in (14b) and (15b):

(14b) 太郎は車を売った時、びっくりした。

Taro-wa kuruma-o utta toki, bikkurishita.

'Taro was surprised when (he) sold (his) car.'

(15b) 太郎は爪を切るのをやめた。

Taro-wa tsume-o kiru no-o yame-ta.

'Taro stopped clipping (his) nails.'

If the possessor is to be coreferent with the matrix subject in these sentences, the reflexive pronoun must be used, as in (14c) and (15c).

The reflexive pronoun: coreferential with the subject of the matrix clause

(14c) 太郎は次郎が自分の車を売った時、びっくりした。

Taro-wa Jiro-ga jibun-i no kuruma-o utta toki, bikkurishita.

'Taro was surprised when Jiro sold (his) car.'

(15c) 太郎は次郎が自分の爪を切るのを見ていた。

Taro-wa Jiro-ga jibun-i no tsume-o kiru no-o mitei-ta.

'Taro was looking at Jiro clipping (his) nails.'

Interestingly, an example that parallels (15a) is semantically unacceptable:

?? Taro-wa tsume-o kiru no-o mitei-ta.

'Taro was looking at (himself) clipping (his) nails.'

The unacceptability of the sentence is due to the fact that our world knowledge indicates that when someone clips his nails, they must look at it, so that there is no point in making this statement, unless it is accompanied by the reflexive pronoun or other information such as an adverb.

This phenomenon is referred to as a 'long distance reflexive' in contrast with the binding of, for example, the English reflexive pronouns.

Note that jibun can bind either intrasententially or intersententially depending on sentences. (14c) and (15c) with some contexts can potentially be interpreted as jibun being coreferential with the subject of the subordinate clause, so that the interpretation can be ambiguous. This is another area which requires further investigation for an explicit description. The given interpretations for (14c) and (15c) above are the immediate interpretation given by native speakers of Japanese without context and hard thinking.
Thus, we can draw the following generalisation regarding referent identification of the ellipted genitive and the reflexive pronoun, which will be used in the construction of the algorithm in the next chapter for a more comprehensive account. If the sentence has an ellipted genitive,\textsuperscript{13} it is coreferential with the subject of that clause. If the sentence has the reflexive pronoun, it is coreferential with the subject of the clause or, in the case of a complex sentence, with the matrix subject (i.e. long distance reflexive) (see §7.1 for the treatment).

6.5 **Summary of the three tiers of linguistic devices**

Before moving on to Part 3 which discusses the process of referent identification, I summarise Part 2, which has examined the linguistic devices for referent identification for ellipted arguments. I have demonstrated that the mechanisms of ellipsis resolution stem from the three tiers of linguistic devices:

1. **Predicate devices** (Chapter 3):
   morphological signals about the type of subject on the verbal predicates
2. **Sentence devices** (Chapters 4 and 5):
   mechanisms as to how a sentence is structured
3. **Discourse devices** (Chapter 6):
   mechanisms as to how sentences are sequenced

*The predicate devices* work, in a very loose sense, like subject-verb agreement reflecting the referential identity of subject on the predicates, which are not restricted to verbs, but also include adjectives and nominal predicates (see Chapter 3). The relevant categories, however, are not those of person, number and gender commonly found in Indo-European languages, but can be broken down into four elements: 1) Verbal semantics (signalling person/animacy of the subject), 2) Switch-reference

\textsuperscript{13} Unspecified nominals in Japanese can be marked by the genitive or the definite article in the English translation. The identification whether they are definite or possessive is left for future study.
The sentence devices govern the structure of sentences. I proposed the principle of direct alignment by which a sentence is structured to form a direct alignment of arguments in terms of person/animacy hierarchy and discourse salience. Accordingly, an argument high on the person/animacy hierarchy and in discourse salience is expressed as the subject (except for low-transitive sentences) and the sentence is structured around this. I also proposed the principle of ellipsis showing that an argument high on the person/animacy hierarchy and in discourse salience is most prone to ellipsis. Given the principle of direct alignment, it is only natural that ellipsis is predominantly of the subject, but non-subjects can be ellipted infrequently, mostly in co-occurrence with subject ellipsis.

The discourse devices control how the subject oriented sentences are sequenced with the topic as a pivot, which is most prone to ellipsis. The distinction between wa and ga is vital in differentiating a topicalised subject from a non-topicalised subject. I described the basic mechanism for retrieving referential identity of ellipsis - the 'sustained topic structure' - under which the referent of ellipsis is the nearest preceding wa-marked argument, except in complex sentences where two elements (cataphora and clause-linkage) must also be taken into consideration.

I now turn to consider the relation between the three tiers of linguistic devices. The predicate devices concern the identity of subject. This focus is shared by the sentence devices, in that the sentence devices govern which argument can be the subject. In other words, the sentence devices are linked with the predicate devices by the subject as a hinge. The sentence devices add the distinction between wa and ga, thus differentiating a topicalised subject from a non-topicalised subject.

---

14 Inverse marking can be considered to be one of the predicate devices, as it is marked on the verbal predicate. However, it is not included in the predicate devices, because it has more relevance to the sentence devices. Moreover, switch-reference also has relevance to the discourse devices. Essentially, it marks on the verbal predicate whether or not the two subjects in the sentence are coreferential, therefore it belongs to the predicate devices. However, when a sentence has a disjoint reference, it makes reference to another sentence, so that it also has relevance to the discourse devices.

15 I profited the following observation from Nick Evans.
This distinction between *wa* and *ga* forms the basis for the discourse devices, which are linked with the sentence devices by the topic as a hinge. The discourse devices, however, are not related to the predicate devices. That is to say, the three tiers of devices form a non-cyclic, one way relation which builds one tier on another. The way the three tiers of linguistic devices constitute the mechanisms of ellipsis resolution is illustrated below:

![Ellipsis resolution diagram](image)

**Figure 21: The mechanisms of ellipsis resolution**

In a nutshell, Japanese sentences are structured in such a way as to anchor the subject (by the sentence devices) with argument inferring cues on the verbal predicate (by the predicate devices), and these subject oriented sentences are cohesively sequenced with the topic as a pivot (by the discourse devices). This topicalised subject is most prone to ellipsis. Ellipted non-subjects are infrequent, but do occur. They form a complementary distribution to subject ellipsis, so that subject ellipsis has an enormous bearing on non-subject ellipses with regard to referent identification. The referents of non-subjects are retrieved together with subject ellipsis by using the salient referent list.

The next, final chapter, will show exactly how these three tiers of linguistic devices in conjunction with the salient referent list can resolve the referential identity of ellipted arguments in natural texts, an exercise carried as a way of testing the validity of the claims which I have been making against a corpus of natural data.
We have observed in Part 2 the three tiers of linguistic devices with which to identify the referent of ellipsis: the predicate devices, the sentence devices, and the discourse devices. In Part 3, I will demonstrate precisely how these devices interact and track the referential identity of ellipsis in natural texts. I do this by proposing an algorithm integrating the three tiers in a structured way. The algorithm offers two benefits. One is that it summarises the three devices and gives a clear representation of the mechanisms and the whole operation of ellipsis identification. The other is that it can potentially be adapted into machine translation systems.
7.1 Devising the algorithm

The algorithm consists of three stages.\(^1\) The first stage is to see whether or not a sentence contains any ellipses. In doing so, we process the sentence and create, or in the case of non-initial sentences, update a salient referent list. This input information will assist in the processing of the current and subsequent sentences. The creation and maintenance of a salient referent list has already been explained in §6.3. The second stage is the actual process of identifying the referent of ellipsis (or ellipses). The third stage involves verifying that selection. Below is the algorithm with explanations. The algorithm by itself, without explanatory notes, is attached in the appendices.

Algorithm

Identifying existence of ellipses

Step 1: Parse the sentence into finite clauses.

Every finite clause has a verbal predicate which determines valency and detects the existence of ellipsis, so processing is done on the basis of clauses. Hence, a sentence must first be parsed into clauses. These clauses are processed together, rather than being taken separately, because clause-linkage has a bearing on the referential reading, for example, SS conjunctive particles can enforce SS readings (see §3.5). Step 2: Check the valency of the verbal predicate for each clause, and create a description of the core structure of the sentence showing only the subcategorised arguments (both overt arguments and ellipses) with the markings and below them grammatical relations, and if applicable, mark the reflexive pronoun and the genitive. Each subordinate clause is indicated by square brackets [ ] with clause number on the right side (matrix clauses are numbered but not bracketed), if applicable, together with notations of relative

\(^1\) This algorithm has been adapted and considerably modified from the algorithm by Nakaiwa & Ikehara (1995:101), which was presented in §2.5.3.2.
clause (e.g. 'rcSB', relative clause modifying a subject of a higher clause (see Step 6-3), low-transitive clause (LT), and complement clause.

For example, the following is a contrived structure of a hypothetical sentence:

Core structure: \[\text{[\text{?} \text{?} \text{jibun} \ldots [\text{?} \text{X}_a^{-o} \ldots \text{?} \text{?} \text{Y}_b^{-ga} \ldots]}^{3/\text{rcSB}}\]^{4/LT}\]

Grammatical relations: SB Gen SB OB SB

**Step 3:** If ellipses (in the form of unfilled arguments) are detected, describe the semantic attributes of each ellipsis.

For example:

Semantic attributes of the subject ellipsis and the genitive in Clause 1:

human$^2$

Semantic attributes of the subject ellipsis in Clause 2: inanimate

This information is matched against the selected referent at the final stage of the algorithm for verification.

**Step 4:** Store the information of the overt arguments gathered in Step 2 in the Salient referent list as input information.

As explained in §6.3, a salient referent list stores the information of the required overt arguments: their grammatical relations and topicality, person/animacy and semantic attributes, and when applicable, in-group (IG) / out-group (OG) distinction. For example:

Salient referent list: [s1] \{T1$_a$: \text{watashi} (TopSB; first person) > T2$_d$: \text{tsuma} (OB; third person; \text{tsuma} [IG])\}

**Step 4-1:** If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.

As explained in §6.3, if an argument appears with an identical grammatical relation to another argument already existing in the previous list, for example, a

---

$^2$ Again, the use of the 'Goi Taikei' Valency Dictionary (1997), which can distinguish 2700 types of semantic attributes for common nouns and 130 types of proper nouns on the basis of the verbal predicate will make further specification of the semantic attributes of ellipsis, for example, human/organisation, concrete object, evidence. However, detailed descriptions of semantic attributes are not made in this thesis for simplicity.
topicalised subject exists and a new topicalised subject appears, the new topicalised subject takes its place for reasons of recency.

**Step 5:** If ellipses are described in step 3, go to Step 6.

Or else take the next sentence, or else, end the operation (i.e. if this sentence is the last sentence in the text).

**Identifying referent for the ellipses**

**Step 6:** Apply T1 argument in Salient referent list as the referent for the ellipses.

As explained in §6.1, the basic mechanism is that the referent of ellipsis is the nearest previous wa-marked argument, i.e. T1 argument, namely, in terms of surface structures:

'X-wa ... . øX ... .'

Basically, complex sentences also follow Step 6, except for some complex sentences (see Step 6-2). As shown in §6.1, in terms of surface structures:

'[øX ... ,] X-wa ... .' (cataphora: 13%)

or 'X-wa [øX ... ,] ... .' (anaphora: 87%)

The latter is parsed in this thesis as [X-wa ... ,] øX ... , as explained in §6.3.1. Because the salient referent list is created for the sentence and applied to the same sentence, cataphora is adequately accounted for.

If a wa-marked referent is not found in the sentence, the nearest previous wa-marked referent is listed as T1 in the salient referent list, namely:

'X-wa ... . [Y-ga ... ,] øX ... .'

or 'X-wa ... . [øX ... ,] Y-ga ... .'

or 'X-wa ... . [øX ... ,] øX ... .'

Hence, the T1 argument is selected for the ellipsis first. Then we go through the following substeps from 6-1 to 6-7, identifying the referent of various types, for example, multiple ellipses. These substeps may select different referents based on the structural requirements of the sentence, for example, genitive ellipsis. In such cases, those other referents take precedence over T1.
**Step 6-1:** If *it is the first sentence in the text and has no wa-marked referent in Salient referent list [s1]*, apply the first person or generic referent.\(^3\)

First person is exophora (deictic, see §1.5.1), so that it does not require an overt expression of referent in context.

My examination of 62 written narrative texts in PHP magazines reveals that only 27.4% of arguments in first sentences are ellipted, compared with 47.5% in non-initial sentences. These ellipses in initial sentences all referred to the writer, i.e. first person. That is to say, ellipsis does not occur in initial sentences unless the referent is strongly identifiable as first person or a generic referent.\(^4\) This supports the discussion in §1.7.1 that the speaker only deletes what he believes the addressee can retrieve the identity of.

**Step 6-2:** If *the sentence is a complex sentence and has a ga-marked subject, and the adjacent clauses form a monoclause,* then apply that ga-marked referent.

As shown in §6.1, a *ga*-marked referent has no bearing on ellipsis, except when the adjacent clauses form a monoclause, normally when one or both of the following conditions are held:

- *its conjunctive particle is a SS particle and/or*
- *no clause dividing signal (such as comma or pause) is placed after the first clause (and/or signal after the ga-marked referent in the initial position)*

signifying that the two clauses are to be treated as a mono-clause, namely:

\[
[X\text{-}ga \ (signal) \{... \text{SS particle} / \text{no signal}, \} \ o_x \ ... \{.]
\]

or

\[
[\ o_y \ ... \text{SS particle} / \text{no signal}, \] \ Y\text{-}ga \ ... \{.
\]

**Step 6-3:** A *missing argument in a relative clause is coreferential with*

---

\(^3\) Nakaiwa (1998) states that if it has a title with a referent in it, apply that referent. The category of ‘title’ is deemed to be particularly useful in newspapers where the headings often provide referents.

\(^4\) Comparable results have been reported for Jiwarli (Austin 1998) that only 10% of arguments are ellipted when they appeared in the initial sentences, compared with 45.3% for non-initial sentences.
the head (i.e. the modified NP) of the relative clause.\(^5\)

**Step 6-4:** If the sentence has multiple ellipses within the same clause, apply T1 from Salient referent list to the highest ranked ellipsis in terms of Salient referent order list, T2 for the next highest ellipsis, and T3 for the next highest ellipsis, and so forth.

For example, if a sentence contains a subject ellipsis and an object ellipsis, the subject ellipsis is ranked higher than the object ellipsis following the salient referent order list, so that the T1 argument is linked to the subject ellipsis, T2 to the object ellipsis. Note that genitive ellipses are not included in multiple ellipses, being handled by Step 6-5. As demonstrated in §6.3.2, the selection of referent is not based on the grammatical relations of the ellipses in relation to those of the referents, so that a subject ellipsis may not have a referent that is a subject, though this is mostly the case.

**Step 6-5:** If the sentence has an ellipted genitive, it is coreferential with the subject of that clause. (see §6.4.3)

**Step 6-6:** If the sentence has the reflexive pronoun, it is coreferential with the subject of the clause, or in the case of a complex sentence, the subject of the matrix clause (i.e. long distance reflexive).\(^6\)

As seen in §6.4.4, sometimes the reflexive pronoun appears in the subject position replacing ellipsis, due to the speaker's perspective shift which cognitively treats the same referent differently. Such reflexive pronouns are dealt with under Step 6, i.e. apply the T1 argument.

**Step 6-7:** If the sentence has a low-transitive clause with an ellipted subject, it is coreferential with T1 argument, unless the referent

---

\(^5\) This is a simple treatment. For detailed discussion on relative clauses in Japanese, see Baldwin et al. (1999).

\(^6\) As discussed in §6.4.4, in complex sentences the reflexive pronoun in a subordinate clause is coreferential either with the matrix subject or the subject of the clause. This algorithm is made to choose the matrix subject as the referent. However, if it turned out to be the subject of the clause in which the reflexive pronoun appears and its referent is different from that of the matrix clause, then it is anticipated that the algorithm will pick up the incorrect selection in the third stage which verifies the selection against other devices. I could not find an example to demonstrate this process in the corpus. I have to leave this issue for future study, particularly because the reflexive pronoun is not the main topic of this thesis.
has been selected in the preceding substeps.

Whether or not a clause is a low-transitive clause is determined by the verbal semantics, as explained in §4.6.1. The structure of low-transitive clauses was shown in Table 22 in §5.6 which illustrates the basic patterns of argument structures and ellipsis. Some low-transitive clauses have a dative subject, but such dative subjects are rarely ellipted, as shown in §5.1.2.

Verifying the selection

Step 7:  Verify the selected referents in Step 6 with Sentence devices.

Check SB > nonSB in terms of person/animacy hierarchy and discourse salience by following the principle of direct alignment.

Step 7-1:  If an inverse verb is found, it is reversed for that clause.

Namely, SB < nonSB.

Step 8:  Verify the selected referents in Step 6 with Predicate devices: namely, check the four types:

Step 8-1:  Semantic attributes of the selected referents with those of the ellipses created in Step 3.

Step 8-2:  Check Switch-reference

Step 8-3:  Check Honorifics

Step 8-4:  Check Epistemic morphemes (save for cases where overridden by information contributed by in past tense, subordinate clauses, empathy phenomena, and private verbs)

Note, as shown in §3.4.6 and §3.7, that the readings from epistemic morphemes can be modulated in past tense, in subordinate clauses, with empathy phenomena, and when another epistemic morpheme or honorific coding is suffixed to private verbs.

Step 9:  If the selected referents agree with the selection in Step 7 and Step 8, process the next sentence, or else, end the operation.

Step 9-1:  If a mismatch arises (i.e. the selected referent does not agree with the selection in Step 7 or Step 8), go back to Step 6, select the next referent down in Salient referent list, and repeat the process in
Step 7 and Step 8.

Step 9-2: If the mismatch is not resolved, take the T1 argument from the previous salient referent list [n-1].

As explained in §6.3, as the story goes on and after a new topic is introduced, the previous topic loses the topic status. However, in transition sometimes both topics are kept in tandem and expressed as ellipses, especially if the previous topic is the global or long term topic. This will be substantiated in the text analysis in §7.2.1 ([s10]) and §7.2.3 which presents undercoded sentences.

Step 9-3: If the mismatch is still not resolved, then consider world knowledge.

Although the algorithm is designed to minimise the use of world knowledge, it is still a necessary component of the algorithm, as the importance of world knowledge to understand language has been demonstrated in various sections in this thesis. However, in this thesis, I do not take on the challenge of developing an algorithm to deal with world knowledge. I discuss cases where the use of world knowledge are inevitable in §7.2.4.

The mechanisms of the algorithm will become clear, as we proceed through texts in the next section.

7.2 Testing on sample texts

In this section, firstly I examine one text and see how the algorithm introduced in §7.1 can determine the referential identity of ellipted arguments. Then in §7.2.2, I look at some sections of three different texts which involve more complications and other cues which do not appear in the first text.

7.2.1 Text analysis

The first text used for testing the algorithm is Jinken 'Human rights' from an article in a local newspaper Seikacho Sinbin (2.1999).
Chapter 7

As explained earlier, coreference is noted by subscripts; each subordinate clause is indicated by square brackets [] with clause number on the right side by subscripts (matrix clauses are numbered but not bracketed), if applicable, together with notations of relative clause (e.g. 'rcSB', relative clause modifying a subject of a higher clause (see Step 6-3), low-transitive clause (LT), and complement clause. Now, I begin the text analysis, and the first sentence is as follows:

Text 1 [s1]

私は先週の土曜日ほとんど寝ないでテレビを見続けた。

1sg-TopSB last week of Saturday hardly sleep Neg and SB TV-OB watch continued

'Last Saturday, I hardly slept, instead (?) kept on watching TV.'

In accordance with the algorithm, we detect the existence of ellipsis first, and then proceed to identify the referent of the ellipsis, and verify that selection of referent. Step 1: Parse the sentence into finite clauses.

The sentence [s1] has two conjoined clauses which are indicated by the square brackets with clause numbers.

Step 2: Check the valency of the verbal predicate for each clause, and create a description of the core structure of the sentence. showing only the subcategorised arguments (both overt arguments and ellipses) with the markings and below them grammatical relations, and if applicable, the reflexive pronoun and the genitive.

For the first clause, the verb ne 'to sleep' is an intransitive verb, and its verbal semantics subcategorises a human subject. There is an overt human subject, so this

---

7 A paragraph differentiation does not seem relevant in reference-tracking, although it is highly relevant for referential choices in production, for example, an inferable referent tends to be reiterated in a new paragraph, even though it would be ellipted otherwise. See §2.1 for the discussion of the differences between production (encoding) and processing (decoding). Reiterated nominals are no concern to this thesis, since it examines ellipsis.
clause contains no ellipsis. For the second clause, the verb *mi tsuzuketa* 'kept on watching' is a transitive verb which, according to its verbal semantics, takes a human subject and an object, either animate or inanimate. There is an overt inanimate object 'TV' but no human subject, so this clause contains an ellipsis whose referent has to be a human subject. Hence, [s1] has the following core structure with an ellipted subject:

Core structure: \[a-wa ... , \]

Grammatical relations: \[SB \quad SB \quad OB \]

**Step 3:** If ellipses (unfilled arguments) are detected, describe the semantic attributes of the ellipses.

Semantic attributes of the ellipsis: human

**Step 4:** Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.

Based on the above information, [s1] has an overt human topicalised subject *watashi* and an overt inanimate object *terebi*. Hence, the salient referent list for [s1] is created as follows:

Salient referent list: [s1] \{T1$_a$: *watashi* (TopSB; first person) > T2$_b$: *terebi* (OB; inanimate)\}

**Step 5:** If ellipses are described in step 3, go to Step 6.

*Or else take the next sentence, or else, end the operation*

We need to move on to Step 6, as an ellipted subject has been detected.

**Step 6:** Apply T1 argument in the Salient referent list as the referent for the ellipsis.

Since T1 argument in the salient referent list is 'a' *watashi*, 'a' is applied as referent for the ellipsis, namely:

Core structure: \[a-wa ... , \]

Grammatical relations: \[SB \quad SB \quad OB \]

Step 6 includes other substeps. However, none of them apply to [s1].

**Step 6-1:** If it is the first sentence in the text and has no wa-marked referent in Salient referent list [s1], apply the first person or
Chapter 7

generic referent.

[s1] is a first sentence, and contains a wa-marked argument in the salient referent list.

Step 6-2:  [s1] is not a complex sentence with a ga-marked subject.

Steps 6-3:  it includes no relative clause.

Steps 6-4:  no multiple argument ellipses.

Steps 6-5:  no ellipted genitive.

Steps 6-6:  no reflexive pronoun.

Steps 6-7:  no low-transitive clause.

So we proceed to the next step.

Step 7:  Verify the selected referent in Step 6 with Sentence devices.

Namely, check to see if the clause forms SB > nonSB in terms of person/animacy and discourse salience following the principle of direct alignment.

The subject 'a' is first person and the object 'b' is inanimate, hence the clause satisfies the principle of direct alignment.

Step 8:  Verify the selected referent in Step 6 with Predicate devices.

Step 8-1:  Semantic attributes of the selected referent with those of the ellipsis created in Step 3.

Semantic attributes of the ellipsis:  human

The selected referent is first person, and the verbal semantics of mi tuzuketa 'kept on watching', as shown in the semantic attributes of ellipsis, takes a human subject.  Hence, the selected referent is qualified to be the referent for the ellipsis.

Step 8-2:  Switch-reference

Step 8-3:  Honorifics

Step 8-4:  Epistemic morphemes

There are no honorifics nor epistemic morphemes, but there is a SS particle de.\(^8\)  The SS reading derived from the SS particle agrees with the selection in Step 6, since the two subjects are the same; namely:

---

\(^8\) For simplicity, those particles which relate to the SS/DS indication are referred to as SS/DS particles in this chapter, although whether or not they are qualified to be called switch-reference markers requires more investigation (see §3.5).
Chapter 7

Core structure: [a-wa ... SS.] 1 οa b-o... 2

Grammatical relations: SB SB OB

Thus, the information in the core structure suggests that the whole sentence [s1] is interpreted and translated as follows:

私は先週の土曜日ほとんど寝ないでテレビを見ていた。

[Watashi-wa senshuu no doyoobi hotondo ne nai de] 1 οa terebi-o mitsuzuketa 2

1sg-TopSB last week of Saturday hardly sleep Neg and[SS] SB TV-OB watch continued

'Last Saturday, I hardly slept, instead (I) kept on watching TV.'

Step 9: If the selected referent agrees with the selection in Step 7
and Step 8, process the next sentence, or else end the operation.

Since the selected referent is verified in Steps 7 and 8, and there is another sentence, we move on to process the next sentence.

[s2]
なぜかというと、私は剛のファンで、剛がマラソンに挑戦するので、応援したかったからだ。

[Nazekato iu to, [watashi-wa Goo-no fan de] 1 why say if 1sg-TopSB -Gen fan Cop-and,
[[Goo-ga marason-ni choisensuru node,] 2 ω? ω? oenoshi takatta] 3 kara da 4
-SB marathon-Obl challenge because SB OB cheer wanted because Cop

'The reason is, I'm a fan of Goo, and because Goo was challenging the marathon, (?) wanted to cheer for (?).'

Step 1: Parse the sentence into finite clauses.

There are four clauses, as indicated by the square brackets and clause numbers.

Step 2: Check the valency of the verbal predicate for each clause, and create a description of the core structure of the sentence.

The matrix clause 4 is separated by the three subordinate clauses in the middle; Nazekato iu to, 'The reason' at the beginning and kara da 'is because' at the end, and it contains no ellipsis. The three subordinate clauses consist of two conjoined clauses, the latter with its own subordinate clause; namely, in the order of the first conjoined clause 1, the subordinate clause 2 of the second conjoined clause,
followed by the second conjoined clause 3. Clause 1 is a copula sentence and contains no ellipsis. In Clause 2, all the arguments subcategorised by the verb choosensuru 'to challenge' are overt. In Clause 3, the verb ooenshi 'to cheer' subcategorises the subject and the object, which are both ellipted.

Based on this information, we create the following core structure with an ellipted subject and an ellipted object for [s2]:

Core structure:     ...  [a-wa ... ,]1  [[c-ga ... ,]2   ø? ø? ... ]3   ...  .4
Grammatical relations:     SB               SB       SB    OB

Step 3: If ellipses (unfilled arguments) are detected, describe the semantic attributes of the ellipses.

Both the subject and object ellipses can be either animate, or inanimate representing humans, such as an organisation.

Semantic attributes of both ellipses: animate or organisation

Step 4: Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.

Step 4-1: If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.

[s2] has a topicalised subject watashi-wa, which is the same as the one in Salient referent list [s1], so that it is listed again as T1. There is also a subject argument Goo-ga, which is listed as T2. There is no object in [s2], so we carry the object from Salient referent list [s1] over to Salient referent list [s2]. But now, it is not T2, but T3, because of the presence of a new subject; the subject is higher than the object on the salient referent list order. Hence, the salient referent list for [s2] is created as follows:

Salient referent list: [s2] {T1a: watashi (TopSB; first person) >
T2c: Goo (SB; third person) >
T3b: terebi (OB; inanimate)}

Step 5: If ellipses are described in step 3, go to Step 6.

Or else take the next sentence, or else, end the operation
We need to move on to Step 6 to identify the referents of the two ellipses.

**Step 6:** Apply T1 argument in Salient referent list as the referent for the ellipses.

**Step 6-4:** If the sentence has multiple ellipses within the same clause, apply T1 from Salient referent list to the highest ranked ellipsis in terms of Salient referent order list, T2 for the next highest ellipsis, T3 for the next highest ellipsis, and so forth.

Hence, we apply the T1 'a' argument to the subject ellipsis and the T2 'b' to the object ellipsis, namely:

Core structure: ... [a-wa ... ],1 [c-ga ... ],2 øa øc ... ]3 ... .4
Grammatical relations: SB SB SB OB

**Step 7:** Verify the selected referents in Step 6 with Sentence devices. Namely, check to see if the clause forms SB > nonSB in terms of person/animacy and discourse salience following the principle of direct alignment.

The subject 'a' is first person and the object 'c' is third person, hence the clause satisfies the principle of direct alignment.

**Step 8:** Verify the selected referents in Step 6 with Predicate devices.

**Step 8-1:** Semantic attributes of the selected referents with those of the ellipses created in Step 3.

Semantic attributes of both ellipses: animate or organisation

The selected referents are first person for the subject and third person for the object. The verbal semantics of ooenshi 'to cheer' takes first person subject and third person as the object. Hence, both arguments are qualified to be the referents of the ellipses.

**Step 8-2:** Switch-reference

There are two conjunctive particles; de in Clause 1 denotes SS, and node in Clause 2 denotes DS. These readings agree with the selection in Step 6. Hence, the core structure is added with the conjunctive particles, as follows:

Core structure: ... [a-wa ... SS ],1 [c-ga ... DS ],2 øa øc ... ]3 ... .4
Grammatical relations: SB SB SB OB
Note that Clause 1 contains an SS particle inspite of the DS reading specified by the overt subject in the immediately following clause 2. As mentioned in §2.5.3 and §3.5.1, the interpretation derived from the conjunctive particles is reported to be correct only around 60-90 percent of the time. [s2] has shown one of such cases. When an analysis is set the interpretation derived from the conjunctive particles as the basic information, the interpretation can be overridden by other means, particularly by overt subjects, as is the case with [s2]. However, when an analysis bases the interpretation derived from the discourse devices, i.e. based on salient referent list, then the correct interpretation is reached on the basis of the concept that ellipsis is coreferential with the previous wa-marked argument. In other words, the interpretation from the conjunctive particles works with ellipsis, but not with overt subjects. In fact, the interpretation of ellipsis from the conjunctive particles can detect the incorrect interpretation in the case of undercoded sentences, which will be seen in [s10].

**Step 8-3: Honorifics**  No honorifics are found.

**Step 8-4: Epistemic morphemes**

There is an epistemic morpheme takatta 'wanted'. It signals first person subject which agrees with the selection in Step 6.

Thus, the information in the core structure suggests that the whole sentence [s2] is interpreted and translated, as follows:

なぜかというと、私は剛のファンで、剛がマラソンに挑戦するので、応援したかったからだ。

'The reason is, I'm a fan of Goo, and because Goo was challenging the marathon, (I) wanted to cheer for (him).'</n

**Step 9: If the selected referent agrees with the selection in Step 7 and Step 8, process the next sentence, or else end the operation.**
Since there is no discrepancy and there is another sentence, we move on to process the next sentence.

[s3]
その中でたくさんの感動する場面を見た。
There (?) saw a number of moving scenes.

Step 1: Parse the sentence into finite clauses.

This is a simplex sentence.

Step 2: Check the valency of the verbal predicate for each clause, and create a description of the core structure of the sentence.

The verb mita 'saw' subcategorises the subject and the object. The subject is ellipted, but the object is overt, bamen 'scene'. Based on this information, we create the following core structure with an ellipted subject for [s3]:

Core structure: \( \emptyset \text{ d- } \ldots \).
Grammatical relations: SB OB

Step 3: If ellipses (unfilled arguments) are detected, describe the semantic attributes of the ellipses.

The verb subcategorises the subject to be animate, unless metonymically used.

Semantic attributes of ellipsis: animate (or metonymically inanimate)

Step 4: Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.

Step 4-1: If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.

Since there is only one overt argument 'd' bamen in [s3], that is the only argument which needs to be updated and the rest are carried over from [s2]. The overt argument is an object, which replaces the object argument of T3 'b' in [s2]. Hence, the salient referent list for [s3] is created as follows:

Salient referent list: [s3] \{T1\text{a: } watashi (TopSB; first person) >
T2\text{c: } Goo (SB; third person) >
T3\text{d: } bamen (OB; inanimate)\}
Step 5: If ellipses are described in step 3, go to Step 6.

Or else take the next sentence, or else, end the operation

We need to move on to Step 6 to identify the referent of the ellipsis.

Step 6: Apply T1 argument in the Salient referent list as the referent for the ellipsis.

We apply T1 'a' argument into the ellotted subject, so that we now have:

Core structure: \( \emptyset_a \ d-o \ ... \).
Grammatical relations: SB OB

Step 7: Verify the selected referent in Step 6 with Sentence devices.

Namely, check to see if the clause forms SB > nonSB in terms of person/animacy and discourse salience following the principle of direct alignment.

The subject 'a' is first person and the object 'd' is inanimate, hence the clause satisfies the principle of direct alignment.

Step 8: Verify the selected referent in Step 6 with Predicate devices.

Step 8-1: Semantic attributes of the selected referent with those of the ellipsis created in Step 3.

Semantic attributes of ellipsis: animate (or metonymically inanimate)

Since the selected referent is first person, and the verbal semantics of the verb mita 'saw' takes first person subject, the selected referent is qualified to be the referent.

None of the other types of the predicate devices are applicable for [s3]:

Step 8-2: Switch-reference

Step 8-3: Honorifics

Step 8-4: Epistemic morphemes

Thus, the whole sentence [s3] is interpreted and translated as follows:

その中でたくさんの感動する場面を見た。
\( \emptyset_a \ sono \ nakade \ takusanno \ kandosuru \ bamen_d-o \ mita.1 \)
'there inside many moving scene-OB saw'

'There (Ia) saw a number of moving scenes.'

Step 9: If the selected referent agrees with the selection in Step 7 and Step 8, process the next sentence, or else end the operation.
Since the selected referent is verified in Steps 7 and 8 and there is another sentence, we move on to process the next sentence.

[S4]

'Specially, (?), Tokuni, was impressed with the scene that people with disability challenged (?), tried hard without giving up, and (?) made (?) dreams come true.'

**Step 1: Parse the sentence into finite clauses.**

There are six clauses, as indicated by the square brackets and numbers, including two relative clauses and one low-transitive clause. As explained earlier, akirame nai de is treated as a phrase for simplicity.

**Step 2: Check the valency of the verbal predicate for each clause,**

*and create a description of the core structure of the sentence.*

---

9 Note that it is normal word order to place the ellipted subject of a low-transitive clause before the nominative object (§4.9). However, since the nominative object has a relative clause encompassing four clauses and the ellipted subject of a low-transitive clause is too far away from it, I place the ellipted subject after the object for clarity. This adjustment is made also in subsequent sentences.
Clause 1 is a relative clause which is modifying the subject of a higher clause (i.e. the head), and this is noted by rcSB on the right of the clause number. Clause 5 is also a relative clause which encompasses the clauses 1, 2, 3, and 4, and it modifies the nominative object of Clause 6, noted by rcOB. Clauses 2, 3 and 4 are conjoined clauses. Clause 6 is a low-transitive clause as identified by the verbal predicate, and comprises the structure [(SB-wa) OB-ga Verbal predicate]. It has an overt nominative object, but a topicalised subject is ellipted, which can only be human.

The verb *chosen(suru)* 'to challenge' in Clause 2 subcategorises the subject and a *ni*-marked oblique, both of which are overt. Clause 2 has the reflexive pronoun whose referential identity has to be retrieved. The verb *doryokushi* 'to try hard' in Clause 3 subcategorises the subject which is ellipted. Clause 4 has an overt object but the subject is ellipted and can only be human. Clause 4 also has an ellipted genitive. Thus, the subjects in Clauses 1, 3, 4 and 6 and one genitive in Clause 4 are ellipted, in addition to one genitive reflexive pronoun in Clause 2, all of which have human referents. As noted in footnote 8 §1.5.1.3, *jibun* is restricted to refer to humans, with other forms used to refer to non-humans.

Based on this information, we create the following core structure with the ellipses and the reflexive pronoun for [s4]:

Core structure:  
```
[[(Ø z-o ...)]1/rcSB e-ga jibun? ...,]2  [Ø ...,]3  [Ø, Ø f-o ...]4]5/rcOB Ø ...  
```

Grammar relations: SB OB SB GenRef SB Gen OB SB

**Step 3:** If ellipses (unfilled arguments) are detected, describe the semantic attributes of the ellipses.

Semantic attributes of five ellipses and one reflexive pronoun: human

**Step 4:** Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.

**Step 4-1:** If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.
[s4] has one human overt ga-marked argument *hito-tachi*, which is the subject. So we list it as T2 by replacing the subject argument in Salient referent list [s3]. There are also two inanimate object arguments. In such a case, the second object is listed as T3, for reasons of recency, by replacing the object argument in Salient referent list [s3]. There is no topicalised argument, so T1 is carried over. Hence, the salient referent list [s4] is created as follows:

\[
\text{Salient referent list: } [s4] \quad \{T1_\text{a: } \text{watashi (TopSB; first person)} > T2_\text{c: } \text{hito-tachi (SB; third person)} > T3_\text{f: } \text{yume (OB; inanimate)}\}
\]

**Step 5:** *If ellipses are described in step 3, go to Step 6.*

We need to move on to Step 6 to identify the referents of the ellipses and the reflexive.

**Step 6:** *Apply T1 argument in the Salient referent list as the referent for the ellipses.*

**Step 6-2:** *If the sentence is a complex sentence and has a ga-marked subject, and the adjacent clauses form a monoclause, then apply that ga-marked referent.*

If a ga-marked referent is found in the subordinate clause, the reading is unaffected, except when two clauses are treated as a monoclause, for example, where the conjunctive particle indicates SS. Since the three subordinate clauses are conjoined by SS particles, we apply the overt ga-marked subject 'e' from Clause 2 to all of those subject ellipses. Hence, [s4] now has the following core structure:

Core structure:  

\[
[([\text{\[z-o \ldots\]1/\text{recSB e-ga jibun\ldotsSS\ldots2 [\text{\[\ldotsSS\ldots3 [\text{\[\ldotsf-o\ldots4]5/\text{recOB o\ldots} \ldots\ldots6/LT}}}}\]
\]

Grammatical relations: SB OB SB GenRef SB SB Gen OB SB

**Step 6-3:** *A missing argument in a relative clause is coreferential with the head of the relative clause.*

**Step 6-5:** *If the sentence has an ellipted genitive, it is coreferential with the subject of that clause.*

**Step 6-6:** *If the sentence has the reflexive pronoun, it is coreferential with the subject of the clause, or in the case of a
complex sentence, the matrix subject.

Hence, 'e' of the ga-marked subject is applied to the reflexive, the genitive and the relative clause, pending the subject selected in Clause 6 to Step 6-7 dealing with low-transitive clauses.  [s4] now has the following core structure:

Core structure: [[[ø e z-o ...]1/recSB [e-ga jibun e ...SS,]2 [ø e ...SS,]3 [ø e ø f-o-o-o-o]4]5/recOB ø ... -6/LT
Grammatical relations: SB OB SB GenRef SB Gen OB SB

Semantic attributes of all ellipses: human

**Step 6-7:** If the sentence has a low-transitive clause with an ellipted subject, it is coreferential with T1 argument, unless the referent has been selected in the preceding substeps.

[s4] has a low-transitive clause, Clause 6. It has a nominative object but the subject is ellipted, so that it is coreferential with the topicalised subject T1 'a'. Now, we have retrieved the referents of all ellipses and the reflexive, and the final core structure is created as follows:

Core structure: [[[ø e z-o ...]1/recSB [e-ga jibun e ...SS,]2 [ø e ...SS,]3 [ø e jibun e f-o-o-o-o]4]5/recOB ø a ... -6/LT
Grammatical relations: SB OB SB GenRef SB Gen OB SB

**Step 7:** Verify the selected referents in Step 6 with Sentence devices.

Check to see if the clause forms SB > nonSB.

The selected referents are all third person, except for the subject in Clause 6, which is first person. Since the non-subjects are all inanimate, the clauses satisfy the principle of direct alignment.

**Step 8:** Verify the selected referents in Step 6 with Predicate devices.

**Step 8-1:** Semantic attributes of the selected referents with those of the ellipses created in Step 3.

Semantic attributes of six ellipses and one reflexive pronoun: human The selected referents of third person for all ellipses as well as first person in clause 6 are all qualified to be the referents.

**Step 8-2:** Switch-reference
Step 8-3: Honorifics

Step 8-4: Epistemic morphemes

There are no honorifics nor epistemic morphemes, but SS particles are used in Clauses 3 and 4, as selected in Step 6-2.

Thus, the whole sentence [s4] is interpreted and translated by the core structure as follows:

特に、障害をもつ人たちが、自分の夢に挑戦し、あきらめないで努力して夢を実現していく姿がとても心に残った。

Tokuni, [[[ ø shoogai-zo motsu]1/rcSB hito-tachi-ga, jibun-no yume-ni choosenshi-ø.]2
specially SB disability-OB have person-pl-SB self-Gen dream-Obl challenge-and[SS]

[akirame nai de ø doryokushi te.]3 [ ø ø yume-t-o jitugenshi-teiku]4/5/rcOB
give up Neg with SB effort and[SS] SB Gen dream-OB fruition-Impf
sugata-ga ø totomo kokoro-ni nokotta.6/LT
scene-NomOB SB very much mind-Loc left
'Specially, (I) was impressed with the scene that people with disability challenged (their own) dreams, (they) tried hard without giving up, and (they) made (their) dreams come true.' (lit. for the matrix clause; ‘(I) got left in (my) mind with the scene that ....’)

Step 9: If the selected referents agree with the selection in Step 7

and Step 8, process the next sentence, or else end the operation.

Since there is no discrepancy, we move on to process the next sentence.

[s5]
両足が不自由になり、以前にやっていたロッククライミングをあきらめた人がいた。

[[ø ø Ryoo ashi-y-ga fuiyuuni nari-ø.]1/LT
SB Gen both legs-NomOB disable become-and
[ø izen yattei ta rock climbing1-o akirameta]2/3/rcSB hito-ga
ita.4
SB before doing Past rock-climbing-OB gave up person-SB existed
'There was a person who gave up rock-climbing that (?) used to do, after both of (?) legs became disabled.'

Step 1: Parse the sentence into finite clauses.
There are four clauses, as indicated by the square brackets and clause numbers.\(^{10}\)

**Step 2:** *Check the valency of the verbal predicate for each clause, and, create a description of the core structure of the sentence.*

Clause 1 is a low-transitive clause. It has a nominative object 'y', but the subject and the genitive of the nominative object are ellipted; the verbal semantics indicate that both must be human referents. Clause 2 is a transitive clause. It has an overt object 'h' and an ellipted subject. The verbal semantics indicate that the subject referent is human. Clauses 1 and 2 are conjoined clauses. Clause 3 is a relative clause encompassing Clauses 1 and 2, which modify the head of a relative clause. The head is the subject of Clause 4 'g', noted by rcSB. Clause 4 is an existential clause and contains no ellipsis. Based on this information, the core structure for [s5] is created as follows:

Core structure:  
\[
[[\theta? \theta? \ y-ga \ldots]_{1/LT} \ [\theta? \ h-o\ldots]_{2}]_{3/rcSB} \ g-ga
\]

Grammatical relations:  
SB Gen NomOB SB OB SB

**Step 3:** *If ellipses (unfilled arguments) are detected, describe the semantic attributes of the ellipses.*

Semantic attributes of the three ellipses: human

**Step 4:** *Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.*

**Step 4-1:** *If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.*

[s5] has one human overt argument *hito*, which is a non-topicalised subject. So we list it as T2, replacing the subject argument 'e' in Salient referent list [s4]. There are two inanimate object arguments 'y' and 'h'. The latter 'h' is listed as T3 due

---

\(^{10}\) As in [s4], strictly speaking, *izen yattei ta* in Clause 2 is another clause missing an object, a relative clause modifying the object, *rock-climbing*. However, this complexity is precluded here, because its English translation is redundant and processing relative clauses was already explained in [s4] and in many other sentences.
to its recency, by replacing the object argument 'f' from Salient referent list [s4]. There is no topicalised argument, so that T1 'a' is carried over. Hence, we create the salient referent list [s5] as follows:

Salient referent list: [s5]  {T1\(_a\): watashi (TopSB; first person) >
T2\(_g\): hito (SB; third person) >
T3\(_h\): rock-climbing (OB; inanimate)}

**Step 5:** *If ellipses are described in step 3, go to Step 6.*

We need to move on to Step 6 to identify the referents of the ellipses.

**Step 6:** *Apply T1 argument in the Salient referent list as the referent for the ellipses.*

**Step 6-2:** *If the sentence is a complex sentence and has a ga-marked subject, and the adjacent clauses form a monoclause, then apply that ga-marked referent.*

Since the two subordinate clauses 1 and 2 are conjoined by a SS particle *nari* 'become and [SS]' (a verb stem without a conjunctive particle denoting SS, see §3.5.1), the subjects in Clauses 1 and 2 are coreferential. The actual identity of these subjects' reference has to wait for the next step, and for the moment is noted by ß.

Core structure:  

grammatical relations:  

**Step 6-3:** *A missing argument in a relative clause is coreferential with the head of the relative clause.*

This means that 'g' of the *ga*-marked subject in Clause 4 is applied as referent for the subjects in Clauses 1 and 2. The core structure for [s5] now looks like the following:

Core structure:  

grammatical relations:  

**Step 6-5:** *If the sentence has an ellipted genitive, it is coreferential*
with the subject of that clause.

Core structure: 

\[
[[ \sigma_g \sigma_g y-ga \ldots SS,]_1/\text{LT} \ [ \sigma_g h-o\ldots ]_2/\text{rcSB} \ g-ga
\]

Grammatical relations: \( \text{SB Gen NomOB} \quad \text{SB OB} \quad \text{SB} \)

**Step 6-7:** If the sentence has a low-transitive clause with an ellipted subject, it is coreferential with T1 argument, unless the referent has been selected in the preceding substeps.

[s5] has a low-transitive clause, Clause 1. It has a nominative object but the subject is ellipted. The selection of the referent has been made as 'g' in Steps 6-2 and 6-3. Note that in [s4] T1 was selected for the subject of a low-transitive clause, while in [s5] T1 is an incorrect referent. This difference is due to the fact that the low-transitive clause in [s4] was a matrix clause, while that in [s5] is a subordinate clause, a relative clause. Hence, the ellipsis in [s5] is coreferential with the head of the relative clause in Clause 3, rather than the discourse topic T1.

**Step 7:** Verify the selected referents in Step 6 with Sentence devices.

Namely, check to see if the clause forms SB > nonSB.

The selected referents are all third person and non-subjects are inanimate. Hence, the clauses satisfy the principle of direct alignment.

**Step 8:** Verify the selected referents in Step 6 with Predicate devices.

**Step 8-1:** Semantic attributes of the selected referents with those of the ellipses created in Step 3.

The selected referents are third person, and the semantic attributes of the three ellipses are all human, hence they are all qualified to be the referents.

**Step 8-2:** Switch-reference

**Step 8-3:** Honorifics

**Step 8-4:** Epistemic morphemes

There are no honorifics or epistemic morphemes, but a SS particle is used in Clause 1, which was incorporated in Step 6-2.

Thus, [s5] is interpreted and translated by the core structure as follows:
両足が不自由になり、以前にやっていたロッククライミングをあきらめた人がいた。

There was a person who gave up rock-climbing that (he) used to do, after both of (his) legs became disabled.

Step 9: If the selected referents agree with the selection in Step 7

and Step 8, process the next sentence, or else end the operation.

Since there is no discrepancy, we move on to process the next sentence.

ある日、その人は、雑誌を見ていたら、外国人の両足のないヒューさんがロッククライミングをして成功していることを知った。

One day, when the person was reading a magazine, (?) noticed that Hugh, a foreigner with no legs, attempted rock-climbing and (?) succeeded in (?).'

Step 1: Parse the sentence into finite clauses.

There are five clauses, as indicated by the square brackets and clause numbers.

Step 2: Check the valency of the verbal predicate for each clause, and create a description of the core structure of the sentence.

Clauses 1 and 2 are transitive clauses with no ellipsis.  Clauses 2 and 3 are conjoined clauses.  Clause 3 takes two arguments from its verbal semantics: a human subject and an inanimate oblique, both of which are ellipted.  Clause 4 is a noun-complement clause with the nominaliser koto which encompasses Clauses 2 and 3.  Clause 5 is a transitive clause with an ellipted subject, which is human.  Based on this information, the core structure for [s6] is shown below:
Core structure: \[ g\text{-wa t-o... }]_1 \{ [ i-ga h-o... ]_2 \{ [ o' o' ... ]_3 \} / \text{Comp-o} \ o' \} \]

Grammatical relations: \( SB \ OB \ \\ \ \ \ \ SB \ OB \ \ \ \ \ \ SB \ \text{Obl} \ \ SB \)

**Step 3:** *If ellipses (unfilled arguments) are detected,*

*describe the semantic attributes of the ellipses.*

Semantic attributes of three ellipses:
- the subject in Clause 3 is animate or organisation.
- the oblique in Clause 3 is inanimate.
- the subject in Clause 5 is human.

**Step 4:** *Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.*

**Step 4-1:** *If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.*

[s6] has two human overt arguments: a topicalised subject 'g' and a ga-marked subject 'i'. So we list 'g' and 'i' as T1 and T2 respectively by replacing the arguments 'a' and 'g' in Salient referent list [s5]. Note that 'g' is accompanied by a demonstrative, signalling that it is a reiteration of a previously introduced referent. There are also two overt inanimate object arguments, 'h' and 't'. 'h' is listed for reasons for recency. This selection is the same as what is in Salient referent list [s5]. Notice that the reiteration of 'g' and 'h' substantiates what was discussed in §6.3. Normally, arguments low in the person/animacy hierarchy and discourse salience tend to be repeated instead of ellipted, even if they are referential. We thus create the salient referent list [s6] as follows:

Salient referent list: [s6] \{ T1_\text{g}: \text{hito} (\text{TopSB}; \text{third person}) > \\
T2_\text{i}: \text{Hugh} (\text{SB}; \text{third person}) > \\
T3_\text{h}: \text{rock-climbing} (\text{OB}; \text{inanimate}) \}

**Step 5:** *If ellipses are described in step 3, go to Step 6.*

We need to move on to Step 6 to identify the referents of the ellipses.

**Step 6:** *Apply T1 argument in the Salient referent list as the referent for the ellipses.*
Since there is a *wa*-marked subject 'g' T1 in the sentence, it is taken as the referent for the subject ellipses:

Core structure: 
\[
\begin{array}{|c|c|c|}
\hline
\text{g-wa} & \text{t-o...} & \text{i-ga} \hline
\end{array}
\begin{array}{|c|c|c|}
\hline
\text{h-o...} & \text{\emptyset} & \text{\emptyset} \hline
\end{array}
\begin{array}{|c|c|c|}
\hline
\text{\emptyset} & \text{\emptyset} \hline
\end{array}
\begin{array}{|c|c|c|}
\hline
\text{\emptyset} & \text{\emptyset} \hline
\end{array}
\hline
\end{array}
\] 4/Comp-o 
\begin{array}{|c|c|c|}
\hline
\theta_\text{g} & \ldots & \text{.5} \hline
\end{array}

Grammatical relations: \( \text{SB OB SB OB SB Obl SB} \)

**Step 6-2:** *If the sentence is a complex sentence and has a ga-marked subject, and the adjacent clauses form a monoclause, then apply that ga-marked referent.*

Since Clauses 2 and 3 are conjoined by a SS particle, we change the subject of Clause 3 to the subject ellipsis in Clause 2, i.e. 'i'.

Core structure: 
\[
\begin{array}{|c|c|c|}
\hline
\text{g-wa} & \text{t-o...} & \text{i-ga} \hline
\end{array}
\begin{array}{|c|c|c|}
\hline
\text{h-o...} & \text{\emptyset} & \text{\emptyset} \hline
\end{array}
\begin{array}{|c|c|c|}
\hline
\text{\emptyset} & \text{\emptyset} \hline
\end{array}
\begin{array}{|c|c|c|}
\hline
\text{\emptyset} & \text{\emptyset} \hline
\end{array}
\hline
\end{array}
\] 4/Comp-o \( \theta_\text{g} \)
\begin{array}{|c|c|c|}
\hline
\text{\ldots} & \text{.5} \hline
\end{array}

Grammatical relations: \( \text{SB OB SB OB SB Obl SB} \)

**Step 6-4:** *If the sentence has multiple ellipses within the same clause, apply T1 from Salient referent list to the highest ranked ellipsis in terms of Salient referent order list, T2 for the next highest ellipsis, and T3 for the next highest ellipsis, and so forth.*

Clause 3 has multiple ellipses of the subject and the oblique. T2 'i' has already been assigned for the subject by Step 6-2, so that the next referent down in Salient referent list, i.e. T3 'h', is assigned for the oblique. Hence, [s6] has the following core structure:

Core structure: 
\[
\begin{array}{|c|c|c|}
\hline
\text{g-wa} & \text{t-o...} & \text{i-ga} \hline
\end{array}
\begin{array}{|c|c|c|}
\hline
\text{h-o...} & \text{\emptyset} & \text{\emptyset} \hline
\end{array}
\begin{array}{|c|c|c|}
\hline
\text{\emptyset} & \text{\emptyset} \hline
\end{array}
\begin{array}{|c|c|c|}
\hline
\text{\emptyset} & \text{\emptyset} \hline
\end{array}
\hline
\end{array}
\] 4/Comp-o \( \theta_\text{g} \)
\begin{array}{|c|c|c|}
\hline
\text{\ldots} & \text{.5} \hline
\end{array}

Grammatical relations: \( \text{SB OB SB OB SB Obl SB} \)

**Step 7:** *Verify the selected referents in Step 6 with Sentence devices.*

The selected referents for the subjects are all third person and non-subjects are all inanimate. Hence, the clauses satisfy the principle of direct alignment.

**Step 8:** *Verify the selected referents in Step 6 with Predicate devices.*

**Step 8-1:** *Semantic attributes of the selected referents with those of*
the ellipses created in Step 3.

Semantic attributes of three ellipses created in Step 2 are as follows, and the selected referents in Step 6 meet the semantic attributes:

- the subject in Clause 3 is animate or an organisation.
- the oblique in Clause 3 is inanimate.
- the subject in Clause 5 is human.

Step 8-2: **Switch-reference**

A SS particle is used in Clause 2, which has already been incorporated in Step 6-2. There is also a DS particle *tara* in Clause 1, which also verifies the selection that the subject in Clause 1 is different from the overt subject in Clause 2.

Step 8-3: **Honorifics**

Step 8-4: **Epistemic morphemes**

There are no honorifics or epistemic morphemes.

Thus, the whole sentence [s6] is interpreted and translated by the core structure as follows:

ある日、その人は、雑誌を見ていたら、外国人の両足のないヒューさんが
ロッククライミングをして成功していることを知った。

*Aruhi, [sono hito-ga wa zasshi-o mitei tara]_1*

one day that person-TopSB magazine-OB looking when[DS]

[[gaikokujin no ryoo ashi no nai Hugh-san-ga rockclimbing_h-o shi-te]_2

foreigner Gen both legs of Neg Hugh-Mr-SB rock-climbing-OB do-and[SS]

[ø i ø h seikoo shiteiru]_3 koto]_4 Comp o ø g shitta]_5

SB Obl success have been Nomz -OB SB knew

One day, when the person, was reading a magazine, (he_g) noticed that Hugh_h, a foreigner with no legs, attempted rock-climbing and (he_i) succeeded in (it).'

Step 9: **If the selected referents agree with the selection in Step 7**

and Step 8, process the next sentence, or else end the operation.

Since there is no discrepancy, we move on to process the next sentence.

[s7]

そのことに心を打たれて、自分ももう一度自分の夢を実現しようと決心した。

[ø? Sono koto ni ø? kokoro_o ut-are te]_1

SB that thing by Gen heart-OB move-Pass and

[jibun? mo moo ichido jibun? no yume_t-o jitsugen sase yoo]_2 Comp to ø?

kesshinshita]_3

self also-SB more once self Gen dream-OB come true Caus Voli Comp SB decided
'(?) was moved by that, and (?) decided that (self?) also wanted to try again to make
(?) dream come true.'

**Step 1:**  *Parse the sentence into finite clauses.*

There are three clauses, as indicated by the square brackets and clause numbers.

**Step 2:**  *Check the valency of the verbal predicate for each clause,*

*and create a description of the core structure of the sentence.*

Clause 1 has an ellipted subject, an ellipted genitive and an overt inanimate object 'x'. According to the verbal semantics, the ellipted subject can only be human. Clause 2 is a transitive clause with two reflexive pronouns. Clause 2 is a verb-complement clause for Clauses 3. Clause 3 is a transitive clause with an ellipted subject, which, according to the verbal semantics, can only be human.

Based on this information we have gathered so far, the core structure for [s7] is created as follows:

Core structure:  
\[
[ \_ ? \_ ? \_ x - o \ldots ]_1 [ jibun? \_ jibun? \_ j - o \ldots ]_2/\text{Comp} \_ ? \_ ? \_ \_ , \ldots , 3
\]

Grammatical relations:  
\[
\text{SB} \quad \text{Gen OB} \quad \text{SB} \quad \text{Gen OB} \quad \text{SB}
\]

**Step 3:**  *If ellipses (unfilled arguments) are detected,*

*describe the semantic attributes of the ellipses.*

Semantic attributes of two ellipses and two reflexive pronouns:  human

**Step 4:**  *Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.*

**Step 4-1:**  *If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.*

[s7] has no human overt argument and two overt inanimate objects. The subject in Clause 2 is the reflexive pronoun, whose referent still needs to be identified. So we carry over T1 'g' and T2 'i' from Salient referent list [s6], and replace T3 object argument 'h' with the latter object *yume* and listed it as T3 'j'. Thus, the salient referent list for [s7] is as follows:
Salient referent list: [s7]  {T1: hito (TopSB; third person) >
T2: Hugh (SB; third person) >
T3: yume (OB; inanimate)}

Step 5:  *If ellipses are described in step 3, go to Step 6.*

We need to move on to Step 6 to identify the referents of the ellipses, the reflexive and the genitive.

Step 6: *Apply T1 argument in the Salient referent list as the referent for the ellipses.*

We apply T1 'g' to the subject ellipses in Clauses 1 and 3 and the reflexive subject in Clause 2, namely:

Core structure:  
[ög  òg  x-o... ]1  [jibung  jibung  j-ö ... ]2/Comp  òg

...  .3

Grammatical relations:  SB  Gen  OB  SB  Gen  OB

Step 6-5:  *If the sentence has an ellipted genitive, it is coreferential with the subject of that clause.*

T2 'g' which is the subject in the same clause is applied to the two genitives, so that [s7] now has the following core structure:

Core structure:  
[ög  ög  x-o... ]1  [jibung  jibung  j-ö ... ]2/Comp  ög

.3

Grammatical relations:  SB  Gen  OB  SB  Gen  OB

Step 6-6:  *If the sentence has the reflexive pronoun, it is coreferential with the subject of the clause, or in the case of a complex sentence, the matrix subject.*

The selection from this substep goes in line with the core structure shown in Step 6-5.

Step 7: *Verify the selected referents in Step 6 with Sentence devices.*

The selected referents are all third person and non-subjects are all inanimate. Therefore, the clauses satisfy the principle of direct alignment.

Step 8:  *Verify the selected referents in Step 6 with Predicate devices.*
Step 8-1:  **Semantic attributes of the selected referents with those of the ellipses created in Step 3.**

Semantic attributes of two ellipses and two reflexive pronouns: human. The selected referents are third person, and semantic attributes of the two ellipses and two reflexives are all human, hence they are all qualified to be the referents.

Step 8-2:  **Switch-reference**

A SS particle is used in Clause 1. The SS reading derived from the SS particle agrees with the selection in Step 6, since the two subjects are the same.

Core structure: $[\varnothing_g \ldots \text{SS}_1]_1 [\text{jibun}_g \text{jibun}_g \text{j-} \ldots]_2/\text{Comp} \varnothing_g \ldots .3$

Grammatical relations: SB SB Gen OB SB

Step 8-3:  **Honorifics**

There are no honorifics.

Step 8-4:  **Epistemic morphemes**

An epistemic morpheme $\text{yoo}$ is used in Clause 2. It denotes one's volition, which is private and strongly associated with first person subject. However, it can be overridden in subordinate clause, as discussed in §3.4.5. The referent here appears in a quoting clause led by a complementizer, and indeed is not a first person.

Now, [s7] is fully translated:

そのことに心を打たれて、自分ももう一度自分の夢を実現させようと決心した。

$[\varnothing_g \text{Sono koto ni } \varnothing_g \text{kokoro-} \text{ut-are te}]_1$

SB that thing by Gen heart-OB move-Pass and[SS]

$[\text{jibun}_g \text{mo moo ichido jibun no yume-} \text{jitsugen sase yoo}]_2 \text{to } \varnothing_g$

self also-SB more once self Gen dream-OB come true Caus Voli Comp SB decided

'(He$_g$) was moved by that, and (he$_g$) decided that (self$_g$) also wanted to try again to make (his$_g$) dream come true.'

Step 9:  **If the selected referents agree with the selection in Step 7 and Step 8, process the next sentence, or else end the operation.**

Since there is no discrepancy, we move on to process the next sentence.

[s8]
そして、毎日練習して、ついにこの日、自分の夢を実現させる時がきた。

'Soshite, [mainichi おれ renshuushi て] 1 tsuini kono hi,
and, every day SB practice and finally this day
[おれ jibun に yume-j-o jitsugen saseru] 2/OB toki-ga kita.3
SB self Gen dream-OB realisation Caus time-SB came

'And (?) practiced every day, and finally one day, the time has come (for ?)
to make (?) dream come true.
-> (lit.) the time came that (?) made (?) dream come true.'

Step 1: Parse the sentence into finite clauses.

There are three clauses, as indicated by the square brackets and clause
numbers.

Step 2: Check the valency of the verbal predicate for each clause,
and create a description of the core structure of the sentence

Clause 1 is an intransitive clause with an ellipted subject.11 Clause 2 is a
transitive sentence. It has an overt object 'j' with the reflexive pronoun and the
ellipted subject. The verbal semantics tell us that the referent is human. Clauses 1
and 2 are conjoined clauses. Clause 2 is a relative clause which modifies the subject
of Clause 3. Clause 3 is an intransitive clause and contains no ellipsis.

Based on this information we have gathered so far, the core structure for [s8]
is created as follows:

Core structure: [おれ ... 1] [おれ じぶん j-o ... ] 2/OB k-ga ...
Grammatical relations: SB SB Gen OB SB

Step 3: If ellipses (unfilled arguments) are detected,
describe the semantic attributes of the ellipses.

Semantic attributes of two subject ellipses and one reflexive pronoun:

human

Step 4: Store the information of the overt arguments gathered in Step
2 in Salient referent list as input information.

11 Clause 1 could also be regarded as a transitive clause, in which case, it also has an ellipted object,
rock-climbing. In such a case, the referent identification is more complicated, in that the referent
rock-climbing is not in the current salient referent list and we have to go back to [s6] where it is listed.
I have to leave this issue to a future study.
Step 4-1:  *If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.*

[s8] has no overt topicalised argument and no overt human argument, but has one inanimate *ga*-marked subject 'k' and one inanimate object 'j'. Again, despite the fact that the same inanimate object was mentioned in the previous sentence and hence referential, it is repeated because it has a low discourse salience and perhaps also for emphasis. So we carry over T1 'g' and T3 'j' from Salient referent list [s7], but list 'k' as T2, replacing the object argument 'j' in Salient referent list [s7]. The salient referent list [s8] stands as follows:

Salient referent list: [s8]  \{T1: *hito* (TopSB; third person) >  
T2: *toki* (SB; inanimate) >  
T3: *yume* (OB; inanimate)\}

Step 5:  *If ellipses are described in Step 3, go to Step 6.*

We move on to Step 6 to identify the referents of the ellipses and the reflexive.

Step 6: *Apply T1 argument in the Salient referent list as the referent for the ellipses.*

We apply T1 'g' to the ellipted subjects.

Core structure: \[\text{ø} g \ldots, \] 1  \[\text{ø} g \text{ jibun} \_? \text{ j-o} \ldots \] 2/\text{rcSB}  k-ga \ldots  .3

Grammatical relations:  SB  SB  Gen  OB  SB

Step 6-6:  *If the sentence has the reflexive pronoun, it is coreferential with the subject of the clause, or in the case of a complex sentence, the matrix subject.*

In [s8], the subject of Clause 2, in which the reflexive appears, is 'g', and is the same referent as the matrix subject T1 'g'. Hence, [s8] has now the following core structure:

Core structure: \[\text{ø} g \ldots, \] 1  \[\text{ø} g \text{ jibun} \_g \text{ j-o} \ldots \] 2/\text{rcSB}  k-ga \ldots  .3

Grammatical relations:  SB  SB  Gen  OB  SB

Step 7:  *Verify the selected referents in Step 6 with Sentence devices.*
The selected referents are all third person, and Clause 1 is intransitive and the non-subject in Clause 2 is inanimate. Hence, the clauses satisfy the principle of direct alignment.

**Step 8:** Verify the selected referents in Step 6 with Predicate devices.

**Step 8-1:** Semantic attributes of the selected referents with those of the ellipses created in Step 3.

Semantic attributes of two subject ellipses and one reflexive pronoun: human The selected referents are third person, and semantic attributes of two subject ellipses and one reflexive pronoun are all human, hence they are qualified to be the referents.

**Step 8-2:** Switch-reference

**Step 8-3:** Honorifics

**Step 8-4:** Epistemic morphemes

There are no honorifics nor epistemic morphemes, but a SS particle is used in Clause 1. The SS reading derived from the SS particle agrees with the selection in Step 6, since the two subjects are the same.

Core structure: \([\varnothing \ldots \text{SS}.])_1 [\varnothing \text{ jibun}_g \ j-o \ \ldots ]_2/\text{rcSB} \ k-ga \ \ldots \]

3

Grammatical relations: SB SB Gen OB SB

Thus, by this core structure, [s8] is now fully translated as follows:

And, he practiced every day, and finally one day, the time has come to make his dream come true.

-> (lit.) the time that he made his dream come true.'

**Step 9:** If the selected referents agree with the selection in Step 7 and Step 8, process the next sentence, or else end the operation.

Since there is no discrepancy, we move on to process the next sentence.
Chapter 7

[90x764]

Televisão através de HUGH-sensei e a gente olhando o desenho, com passos fortes e lentos ele nos mostrou.

- Step 1: **Parse the sentence into finite clauses.**
  - There are four clauses, as indicated by the square brackets and clause numbers.

- Step 2: **Check the valency of the verbal predicate for each clause, and create a description of the core structure of the sentence.**
  - Clause 1 is a transitive clause with an ellipted subject, an overt comitative human referent 'I' (recall we consider all overt human arguments, not just core arguments), and an overt inanimate object 'r'. Clause 2 is an intransitive clause with an ellipted subject. Clause 3 is a relative clause encompassing Clauses 1 and 2, which modify the object 'n' in the relative clause 3, noted by rcOB. Clauses 1 and 2 are conjoined clauses. Clause 4 is a transitive clause with an ellipted subject. According to the verbal semantics, the referents of these three subject ellipses are animate.

- Based on the information we have gathered so far, the core structure for [s9] is created as follows:
  - Core structure: ... [[I-to r-o ...]]1 [I ...]2/3 rcOB I-m-ni ... 4.
  - Grammatical relations: SB with OB SB SB IO

- Step 3: **If ellipses (unfilled arguments) are detected, describe the semantic attributes of the ellipses.**
  - Semantic attributes of the three ellipses: animate
Step 4: Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.

Step 4-1: If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.

[s9] has two human overt arguments; one is a third person oblique 'l' and the other is a first person plural indirect object 'm'. There are also two inanimate object arguments 'r' and 'n', but we take the latter because it is more recent. So we carry over T1, a topicalised argument 'g', and T2 a subject argument 'k' into the updated salient referent list [s8], but replace the object with 'n', and add an indirect object 'm' and an oblique 'l' to the list and order them according to the salient referent order list.

Hence, the salient referent list [s9] is created as follows:

Salient referent list: [s9]  {T1< g: hito (TopSB; third person) >  
T2< k: toki (SB; inanimate) >  
T3< m: watashi-tachi (IO; first person, plural) >  
T4< n: sugata (OB; inanimate) >  
T5< Hugh (Obl; third person) }  

Step 5: If ellipses are described in Step 3, go to Step 6.

We move on to Step 6 to identify the referents of the ellipses.

Step 6: Apply T1 argument in the Salient referent list as the referent for the ellipses.

T1 'g' is applied to all of the subject ellipses, so that [s9] has the following core structure:

Core structure:  ... [[[g  l-to r-o ... ,]1 [g ... ]2 ]3/OCOB  g  m-ni ... 4.
Grammatical relations:  SB with OB  SB

Step 7: Verify the selected referents in Step 6 with Sentence devices. The selected referent for all the ellipses is 'g' which is third person. For Clause 1, the non-subject 'r' is inanimate, so that it satisfies the principle of direct alignment. Clause 2 is an intransitive clause with no other subcategorised argument.

Step 7-1: If an inverse verb is found, it is reversed for that clause, namely, SB < nonSB.
Clause 4 has a first person object, but the inverse verb is used to signal this, hence, it satisfies the principle of direct alignment.

Core structure: \[ ... \{[\sigma_g \text{ 1-to r-o } ... \}]_1 \{[\sigma_g \text{ ... } ]_2 \}_3/\text{rcOB} \sigma_g \text{ m-ni } ... \{\text{Inverse}\}.4 \]

Grammatical relations: SB with OB SB SB IO

**Step 8:** *Verify the selected referents in Step 6 with Predicate devices.*

**Step 8-1:** *Semantic attributes of the selected referents with those of the ellipses created in Step 3.*

Semantic attributes of the three ellipses: animate

The selected referents are third person, and the semantic attributes of the three ellipses are all animate, hence they are all qualified to be the referents.

**Step 8-2:** *Switch-reference*

**Step 8-3:** *Honorifics*

**Step 8-4:** *Epistemic morphemes*

There are no honorifics or epistemic morphemes, but a SS particle is used in Clause 1. The SS reading derived from the SS particle agrees with the selection in Step 6, since the two subjects are the same.

Core structure: \[ ... \{[\sigma_g \text{ 1-to r-o } ...\text{SS },]_1 \{[\sigma_g \text{ ... } ]_2 \}_3/\text{rcOB} \sigma_g \text{ m-ni } ... \{\text{Inverse}\}.4 \]

Grammatical relations: SB with OB SB SB IO

Thus, [s9] is interpreted and translated by the core structure as follows:

テレビを通してヒューさんといっしょに足を一歩一歩力強く前に出してゆっくりと上へ登っていく姿を私たちに見せてくれた。

*lit.* (Heg) showed us the scene on TV where (heg) made powerful upward steps one by one with Huge, and (heg) slowly climbed up.*
Step 9:  **If the selected referents agree with the selection in Step 7 and Step 8, process the next sentence, or else end the operation.**

Since there is no discrepancy, we move on to process the next sentence.

Before processing [s10], note that the referent of the ellipted subjects in Clauses 2 and 4 in [s9] is in fact 'g+l'. However, such an interpretation will require an accumulation of information and world knowledge that if 'g' is making powerful upward steps with 'l', then both of them must be climbing up together. The current algorithm is not equipped to account for this, unless a mismatch of referent selection is detected in Steps 7 and 8. At this stage, I have to leave it as 'g'. This will come up again in [s10] and [s11], and in [s11] we can finally be assured that the referent is indeed 'g+l'. The problem of incorporating such world knowledge is discussed in §7.2.3.

[s10]  
私たちはただ落ちないように願っていた。

Watashi-tachi-ni-water  tada  [ø  ochi nai yooni]1/Comp  negattei-ta.2
   1-pl-TopSB           simply   SB     fall Neg Purp    praying-Past

'We were simply hoping that (?) wouldn't fall.'

**Step 1:**  **Parse the sentence into finite clauses.**

There are two clauses, as indicated by the square brackets and clause numbers.

**Step 2:**  **Check the valency of the verbal predicate for each clause,**  
*and create a description of the core structure of the sentence*

Clause 1 is a complement clause with an ellipted subject which can be animate or inanimate capable of falling, according to the verbal semantics. Clause 2 has all the arguments subcategorised by the verb.

Based on this information we have gathered so far, the core structure for [s10] is as follows:

Core structure:  m-wa  [ ø

Grammatical relations:  SB    SB

**Step 3:**  **If ellipses (unfilled arguments) are detected,**  
*describe the semantic attributes of the ellipses.*
Semantic attributes of the ellipsis: animate or inanimate that can fall

**Step 4:** Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.

**Step 4-1:** If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.

[s10] has only one human overt argument, which is a topicalised subject 'm'. So we list it as T1 by replacing 'g' in Salient referent list [s9], and carry over everything else, except that 'm' is now moved up to T1. Hence, the salient referent list [s10] is as follows:

Salient referent list: [s10] \{T1_m: watashi-tachi (TopSB; first person, plural) > T2_k: toki (SB; inanimate) > T3_n: sugata (OB; inanimate) > T4_l: Hugh (Obl; third person)\}

**Step 5:** If ellipses are described in Step 3, go to Step 6.

We need to move on to Step 6 to identify the referents of the ellipsis.

**Step 6:** Apply T1 argument in the Salient referent list as the referent for the ellipsis.

Thus, we have the following core structure:

Core structure: m-wa [ø_m ... ]_1/Comp ... \cdot 2

Grammatical relations: SB SB

**Step 7:** Verify the selected referent in Step 6 with Sentence devices.

The selected referent is a first person and the clause is intransitive with no subcategorised non-subject argument. Hence, the principle of direct alignment is not relevant to this clause.

**Step 8:** Verify the selected referent in Step 6 with Predicate devices.

**Step 8-1:** Semantic attributes of the selected referent with those of the ellipsis created in Step 3.

Semantic attributes of the ellipsis: animate or inanimate that can fall

The selected referent is a first person, and it is qualified to be the referent by the semantic attributes of the ellipsis.
**Step 8-2:**  *Switch-reference*

**Step 8-3:**  *Honorifics*

**Step 8-4:**  *Epistemic morphemes*

There are no honorifics nor epistemic morphemes, but a DS particle is used in Clause 1. This is a mismatch with the selection in Step 6, since the two subjects have been selected to be the same; namely, the core structure looks like the following:

Core structure:  
* m-wa  [ øm  ...  DS ]1/Comp  ...  2

Grammatical relations:  
SB  SB

We know intuitively that the two subjects are different, and hence the DS particle is indeed correct. As explained in [s2], the interpretation from the conjunctive particles works well for clauses involving ellipsis.

**Step 9:**  *If the selected referent agrees with the selection in Step 7 and Step 8, process the next sentence, or else end the operation.*

**Step 9-1:**  *If a mismatch arises* (i.e. the selected referent does not agree with the selection in Step 7 or Step 8), go back to Step 6, select the next referent down in Salient referent list, and repeat the process in Step 7 and Step 8.

[s10] is a problematic sentence, in that we know for a fact that none of the referents in the salient referent list are correct.

Salient referent list:  
[s10]  
{T1_m: watashi-tachi (TopSB; first person, plural) >  
T2_k: toki (SB; inanimate) >  
T3_n: sugata (OB; inanimate) >  
T4_l: Hugh (Obl; third person)}

It is likely that T4 'l' will be chosen, as it will satisfy all four steps in Step 8. But 'l' is only partly correct. As Clause 1 is a prototypical (not restructured) intransitive clause, Step 7 (the principle of direct alignment) is irrelevant and hence cannot rule it out. This is a real problem, which is discussed in §7.2.4. For simplicity, we suppose now that we have gone through the procedure, exhausted the referent list, but found no referent which satisfies Steps 7 and 8. Then, Step 9-2 accounts for it.
Step 9-2:  If the mismatch is not resolved, take T1 argument from the previous salient referent list [n-1].

The T1 argument in [s9] is 'g'. So we reach the following core structure:

Core structure: $m$-wa [ø $g$ ... DS]$_{1/Comp}$ ... 2
Grammatical relations: SB SB

Watashi-tachi $m$-wa tada [ø $g$ ochi nai yooni]$_{1/Comp}$ negattei-ta 2
1-pl-TopSB simply SB fall Neg Purp[DS] praying-Past

'We were simply hoping that (he) wouldn't fall.'

The need for the T1 from the salient referent list [n-1] is triggered by the fact that 'g' has been T1 and ellipted over a number of sentences, so that it still stays as T1 and is expressed as ellipsis, even when a new topic is introduced. In other words, in principle, the salient referent list can only keep one T1 argument, but cognitively, a long standing T1 in the previous sentences can be expressed as ellipsis, because it is cognitively still active and inferable, i.e. remain as an unofficial T1, when a new topic is just introduced. Furthermore, we can regard the phenomenon that 'g' is the topic over one story/paragraph, while first person (either singular or plural) is the story/global topic. This seems to happen occasionally in natural texts and therefore Step 9-2 was created. This issue will be elaborated in §7.2.4.

[s10] is a problematic sentence, but reflects real texts that may result from the human predisposition to make minor errors in production, and to require world knowledge in processing. Chie Hama (p.c.), a native speaker of Japanese informant, commented that the sentence [s10] is rather unacceptable, because it gives the feeling of having a missing argument, i.e. the ellipted subject should have been overtly stated. On the other hand, other ellipses in the text do not induce such feelings. That is to say, [s10] lacks the key information in the discourse devices which is the absence or presence of subject is dismissed in [s10]. I call such sentences 'undercoded'. This topic is elaborated in §7.2.3.

Cognitively, when native speakers of Japanese hear [s10], the immediate interpretation is the SS reading, namely 'We$_1$ were simply hoping that we$_1$ wouldn't fall', which agrees with the interpretation from the algorithm. It makes perfect sense
and would be the correct interpretation, if there were no DS particle and preceding sentences providing context of the contrary like [s10]. This also suggests that the discourse devices are the first devices used in processing sentences, which is the way in which the algorithm is comprised. After the immediate interpretation giving the SS reading, the addressees soon realise that if 'we' were not climbing, how could 'we' fall? This accumulation of information from the text with world knowledge corrects the initial interpretation and provides with the correct interpretation that who may fall is someone else, namely, [s10] has a DS reading. In addition, the DS particle (i.e. the predicate device) in Clause 1 reinforces the DS reading. This will eventually lead to the referent, 'g'.

However, we know from our real world knowledge that the referent for the ellipsis is, strictly speaking, not 'g', but 'g+1' who were climbing up the rock together in the previous sentence, namely; 'We were simply hoping that (they_{g+1}) wouldn't fall.' This interpretation is confirmed in the next sentence [s11]. Thus, no referents in the salient referent list [s10] are entirely correct, and hence, there is a need for world knowledge, as described in Step 9-3.

Step 9-3: If the mismatch is still not resolved, then consider world knowledge.

World knowledge is elaborated in §7.2.4.

[s11]
長い時間をかけて、二人は頂上までたどり着くことができた。
[futari\_p-wa choojoo made tadoritsuku koto\_2-ga ø?
dekita.
\[two \text{people-TopSB} \text{summit to arrive Nomz-NomOB SB could}\]
'Those two\_p took (?) time, and (?) could arrive at the summit.'

Step 1: Parse the sentence into finite clauses.

There are three clauses, as indicated by the square brackets and clause numbers.

Step 2: Check the valency of the verbal predicate for each clause, and create a description of the core structure of the sentence.
Clause 1 is a transitive clause with an ellipted subject which is human according to the verbal semantics. Clause 2 is an intransitive clause with no ellipsis. Clause 2 is a noun-complement clause which is a nominative object in Clause 3. Clause 3 is a low-transitive clause with an ellipted subject which is human, according to the verbal semantics. Clauses 1 and 2 are conjoined clauses.

Based on the information we have gathered so far, we know that \([s11]\) has the following core structure with two ellipted subjects:

Core structure: \[\emptyset \ q-o\ldots \ 1 \ [ p-wa \ldots \ 2-ga \ \emptyset \ldots \ 3/LT\]

Grammatical relations: \(SB \ OB \ SB \ NomOB \ SB\)

**Step 3:** *If ellipses (unfilled arguments) are detected, describe the semantic attributes of each ellipsis.*

Semantic attributes of the two ellipses: human

**Step 4:** *Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.*

**Step 4-1:** *If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.*

\([s11]\) has one human overt argument, which is a topicalised subject. So it is listed as T1 'p' by replacing T1 'm' in Salient referent list \([s10]\). There is also an inanimate object argument, which is listed as T3 'q' by replacing the object argument 'n' in Salient referent list \([s10]\). We carry over everything else from the salient referent list \([s10]\). Hence, we create the salient referent list \([s11]\) as follows:

Salient referent list: \([s11]\) \(\{T1_p: futari \ (TopSB; \text{third person, plural}) > \)
\(T2_k: toki \ (SB; \text{inanimate}) > \)
\(T3_q: jikan \ (OB; \text{inanimate}) > \)
\(T4_l: Hugh \ (Obl; \text{third person})\}

Note that since *futari* 'the two people' is an overt argument, it is not a direct concern for this thesis, which investigates ellipsis. However, strictly speaking, it refers to 'g+l', namely, 'those two people' = *hitog* and *Hugh*'. Ultimately, the algorithm should be equipped to deal with the situation and recognise it as 'g+l', particularly since the literal translation 'the two people' is not good English. Furthermore, the use of
futari 'the two people' signals that the ellipted subjects in [s9] and [s10] were indeed 'g+l'.

**Step 5:** If ellipses are described in step 3, go to Step 6.

We need to move on to Step 6 to identify the referents of the ellipses.

**Step 6:** Apply T1 argument in the Salient referent list as the referent for the ellipses.

Core structure: \[ \varnothing p q-o... \] 1 \[ p-wa ... \] 2-ga \( \varnothing p \) ...

Grammatical relations: SB OB SB NomOB SB

**Step 6-7:** If the sentence has a low-transitive clause with an ellipted subject, it is coreferential with T1 argument, unless the referent has been selected in the preceding substeps.

[s11] has a low-transitive clause, Clause 4. It has a nominative object but the subject is ellipted. T1 'p' has already been selected in Step 6, and no substeps in Step 6 have selected some other referent.

**Step 7:** Verify the selected referents in Step 6 with Sentence devices.

The selected referents are all third person, and the non-subjects are all inanimate. Hence, the clauses satisfy the principle of direct alignment.

**Step 8:** Verify the selected referents in Step 6 with Predicate devices.

**Step 8-1:** Semantic attributes of the selected referents with those of the ellipsis created in Step 3.

Semantic attributes of two ellipses: human

The selected referents are third person, and semantic attributes of the three ellipses are all human, hence they are all qualified to be the referents.

**Step 8-2:** Switch-reference

**Step 8-3:** Honorifics

**Step 8-4:** Epistemic morphemes

There are no honorifics or epistemic morphemes, but a SS particle is used in Clause 1. The SS reading derived from the SS particle agrees with the selection in Step 6, since the two subjects are the same.
Core structure: \[ \varnothing_p q-o \ldots SS \ldots ]_1 \left[ \varnothing_p p-wa \ldots ]_2-ga \ldots \varnothing_p \right] \text{3/LT} \\

Grammatical relations: SB OB SB NomOB SB

Thus, \([s11]\) is interpreted and translated by the core structure as follows:

長い時間をかけて、二人は頂上までたどり着くことができた。

\([\varnothing_p \text{Nagai jikan} q-o \text{kake te}]_1\)

SB long time-OB take and

\([\text{futari} p \text{-wa choojo made tadoritsuku koto}]_2-ga \varnothing_p \text{dekita}\text{3/LT}\)

two people-TopSB summit to arrive Nomz-NomOB SB could

'Those two took (their) time, and (they) could arrive at the summit.'

Step 9: If the selected referents agree with the selection in Step 7 and Step 8, process the next sentence, or else end the operation.

Since there is no discrepancy, we move on to process the next sentence.

[s12]

私は、足の不自由な人でも、あの険しい岩肌を登ることができると、すごいと思った。

\([\text{Watashi} q-wa} \text{[}[\text{ashi no fujiyuuna击o} \text{demo} \text{ano kewashii iwahada} s-o}\text{1sg-TopSB legs of disabled person even-SB that steep bare rock-OB}\text{noboru koto} \text{1-ga dekiru} \text{2/LT na nte} \text{3/Comp sugoi} \text{4/Comp to omotta}\text{5 climb Nomz-NomOB can Cop Nomz amazing Comp thought}\text{I thought it was amazing that even people with disabled legs could climb up such a rocky mountain.}'

Step 1: Parse the sentence into finite clauses.

There are five clauses, as indicated by the square brackets and clause numbers.

Step 2: Check the valency of the verbal predicate for each clause, and create a description of the core structure of the sentence.

Clause 5 is the matrix clause. The subject is preposed to the initial position, separated from its verbal predicate at the end by the three clauses in the middle. It takes a complement clause, Clause 4. Clause 4 is an adjectival clause taking another complement Clause 3. Clause 3 takes a low-transitive clause, Clause 2, whose subject is a noun complement, Clause 1. \([s12]\) contains no ellipsis.
Based on the information we have gathered so far, [s12] has the following core structure with no ellipsis:

Core structure:     a-wa     \[[[r-demo \[s-o .... ]]1/\text{Comp}  \ ]2/LT  \ ]3/\text{Comp}  \ ]4/\text{Comp} \\
... 5.

Grammatical relations:  SB          SB       OB

Step 3: If ellipses (unfilled arguments) are detected, describe the semantic attributes of each ellipsis.

[s12] contains no ellipsis.

Step 4: Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.

Step 4-1: If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.

[s12] has two human overt arguments; one is a topicalised first person subject 'a' (note that watashi first person singular has appeared earlier so that the earlier coding of 'a' is used), and the other is a third person subject 'r'. So we list them as T1 and T2 respectively, replacing T1 'p' and T2 'k' in the salient referent list [s11]. There is also an inanimate object argument, which is listed as T3 's' by replacing the object argument 'q' in the salient referent list [s11]. The rest in the salient referent list [s11] is T4 'l' which is carried over to the salient referent list [s12]. Hence, the salient referent list [s12] is as follows:

Salient referent list: [s12]  \{T1_a: watashi (TopSB; first person) >  \\
T2_r: hito (SB; third person) >  \\
T3_s: iwahada (OB; inanimate) >  \\
T4_l: Hugh (Obl; third person)\}

Again, we know from world knowledge that T2 'r' refers to 'g+l', whose precise identification has to be left for a future study. Note that number marking in Japanese is not rigid, so that an unmarked singular form hito T2_r can refer to a plural, even though there exists a marked plural form hito-tachi. This is an added complication in the effort of making a more comprehensive algorithm.

Step 5: If ellipses are described in Step 3, go to Step 6.
7.2.2 Other examples

In this subsection, I examine parts of three other texts. Although almost every step in the algorithm has been utilised in the previous subsection, I demonstrate the use of some devices in the algorithm which did not appear much in Text 1 due to genre differences. The next Text 2 reveals the use of various epistemic morphemes particularly well, i.e. the use of Step 8-4 in the algorithm, and Text 3 makes good use of honorifics, i.e. Step 8-3. Finally, Text 4 demonstrates referent identification for 'reconstructed existential constructions', discussed in §4.5.4, which is not yet incorporated in the make-up of the algorithm because of the complexity and requires more investigation. For the sake of brevity and clarity, only the essential elements for referent identification are presented for each text in these examples without the whole process of the algorithm.

7.2.2.1 Text 2: Epistemic morphemes

The following is a part of Text 2 Jibunde gooru teepuo 'Set your own goal' from PHP (2.1999.28-9), a part of which was presented at the beginning of the introduction of this thesis.

Text 2 [s1]
吊革を握りながらフト考えた。
[o? Tsurikawa-o nigiri nagara,]1 o? futo kangaeta,2
SB strap-OB hang while SB suddenly thought
'While (?) hung on to a strap (in a train), (?) suddenly thought.'

[s1] has the following core structure, grammatical relations of arguments, and semantic attributes of the ellipsis, by going through Steps 1 to 4:
Step 6: **Apply T1 argument in Salient referent list as the referent for the ellipses.**

**Step 6-1:** If it is the first sentence in the text and has no wa-marked referent in Salient referent list [s1], apply the first person or generic referent.

This initial sentence does not have an overt topicalised argument, hence, according to Step 6-1, first person is applied as referent for the ellipses and is listed in the salient referent list [s1] as T1 'a':

Salient referent list: [s1]  {T1: watashi (TopSB; first person) > T2: tsurikawa (OB; inanimate)}

[s1] is an initial sentence with no prior sentence or other human referent in the sentence, and its structure is Structure (vi) [ø ... ,] which is more likely to have a SS reading than a DS reading (i.e. SS>DS) (see §3.5.4). Thus, T1 'a' is applied to both ellipted subjects. This is verified in Step 8-2 by the SS particle nagara which conjoins the two clauses. Hence, we reach the following core structure and interpretation:

Core structure: [ø a b-o... SS,]1  ø a ... 2
Grammatical relations: SB OB SB

吊革を握りながらフト考えた。

[ø a Tsurikawa b-o nigiri nagara,]1  ø a futo kangaeta.2
SB strap-OB hang while[SS] SB suddenly thought 'While (I) hung on to a strap (in a train), (I) suddenly thought.'
explained in §3.1.2. This is easily accounted for with the implementation of the Goi taikei Valency dictionary. Accordingly, the salient referent list [s2], core structure, and semantic attributes of the ellipses are as follows:

Salient referent list: [s2]  {T1_{a}: watashi (TopSB; first person) > T2_{c}: shigoto (OB; inanimate)}

Core structure: \( \varnothing \ \ \ \varnothing \ \ ... \).

Grammatical relations: SB OB

Semantic attributes of the subject ellipsis: human
Semantic attributes of the object ellipsis: inanimate

Following Step 6, T1 'a', first person, from the salient referent list is selected to be the referent for the subject ellipsis. This is verified by Step 8-4; yoo is an epistemic morpheme and denotes the speaker's volition. Following Step 6-4 on multiple ellipses, T2 is chosen to be the referent of the object ellipsis. This selection satisfies the principle of direct alignment in Step 7. Thus, [s2] now has the following core structure and interpretation:

Core structure: \( \varnothing_{a} \ \varnothing_{c} \  d- \ ... \).

Grammatical relations: SB OB

「辞めようか。」
\( \varnothing_{a} \ \varnothing_{c} \ Yame \ yoo \ ka. \)
SB OB quit Voli Q
'Shall (I) quit (the job)'

[s3]
妻と子供のことを考える。
\( \varnothing_{a} \ \varnothing_{c} \ Tsuma \ to \ kodomo_{d} \ no \ koto-o \ kangaeru. \)
SB Gen wife[IG(in-group)] and children Gen things-OB think
'(?) think about (?) wife and children.'

This is a simplex sentence with an ellipted subject and genitive with the following salient referent list [s3], core structure, and semantic attributes of the ellipses.

Salient referent list: [s3]  {T1_{a}: watashi (TopSB; first person) > T2_{d}: tsuma & kodomo (OB; third person; [IG])}

Core structure: \( \varnothing_{a} \ \varnothing_{d-o} \  d-o \  ... \).
Grammatical relations: SB Gen OB

Semantic attributes of the ellipses: human

By following Step 6, T1 'a' is chosen as referent for the subject. The referent of the genitive is coreferential with the subject of the clause, according to Step 6-5, hence 'a' is chosen. This selection is verified by the fact that *tsuma* is an in-group term (see §3.3.2), which means the genitive is first person. *Kodomo* is also predominantly an in-group term, though it can be sometimes used for out-group members. The in-group reading here is reinforced by the fact that it is conjoined with the in-group referent. Now, we reach the following interpretation:

妻と子供のことを考える。

\[ \sigma_a \sigma_a Tsuma \text{ to kodomo}_d \text{ no } koto-o kangaeru. \]

SB Gen wife[IG] and children Gen things-OB think

'(I) think about (my) wife and children.'

Since [s4] displays no overt arguments, the salient referent list [s3] is carried over to [s4]:

Salient referent list: [s4] \{T1\(a\): *watashi* (TopSB; first person) > T2\(d\): *tsuma* & *kodomo* (OB; third person; [IG])\}

[s4] has the following core structure and semantic attributes of the ellipsis:

Core structure: \[ \sigma_2 \ldots \] \_1 \_2

Grammatical relations: SB SB

Semantic attributes of the ellipsis: human

This is a tricky sentence, but was explained in §3.4.1. The algorithm will first choose T1 'a' for the both subject ellipses. The final morpheme *kana* in Clause 2 is epistemic and it can only mean 'I wonder', which agrees with the above selection T1 'a'. The referent for the subject ellipsis in Clause 1 as 'a' from the salient referent list will also be supported by the structure of [s4]. As discussed in §3.5.4, Structure
(vi) \(\varnothing \ldots \varnothing\), \(\varnothing \ldots \varnothing\) is more likely to have a SS reading than a DS reading (i.e. SS>DS). Thus, T1 'a' is applied to the ellipted subject in Clause 1 as well.

However, this selection should be invalidated by Step 8-4 because of the form of \(iu\) 'to say'. If the subject were first person, it would have been expressed with a volitional form \(i-\varnothing\), as shown in (68) §3.4.1. Therefore, the referent will be corrected to 'd', which is the next argument on the salient referent list.

Thus, [s4] now has the following interpretation:

\[
\text{なんて言うかな。} \\
[\varnothing_d \ Nante \ iu]_1 \ \varnothing_a \ \text{kana}_2 \\
\text{SB what say SB wonder} \\
'(I) wonder what (they) will say.'
\]

\[\text{家族は反対するだろうから、どのように説明しようかと考えていた。} \\
[\varnothing? \ Kazoku\text{-wa} \ hantaisuru \ doroo \ kara,]_1 \\
\text{Gen family[IG]-Contrastive SB oppose will because} \\
[\varnothing? \ donoyooni \ setsumeishi \ yoo \ ka]_2 \ to]_3 \ \varnothing? \ kangaeteita]_4 \\
\text{SB how explain Voli Q Comp SB thinking} \\
'Because (?) family will oppose (to it), (?) was thinking how (?) can explain (it).'
\]

The core structure and the semantic attributes of the ellipsis for [s5] are as follows:

Core structure: \([\varnothing_d \ d-wa \ldots ]_1 \ [\varnothing_a \ldots ]_2 \ [\varnothing_a \ldots ]_4\) \\
Grammatical relations: Gen Contrastive SB SB SB \\
Semantic attributes of the ellipses: human

This is another complicated sentence to process, in that the wa-marked subject in Clause 1 is used not as a topic but as a contrast, hence it is not replaced by the T1 argument 'a'. I cannot offer a mechanism to distinguish the two usages of wa and have to leave it for a future study. Furthermore, the verbs in Clauses 1 and 2, hantaisuru 'to oppose to something' and setsumeisuru 'to explain something' select the same ni-marked argument, which refers to the whole sentence [s2]. Because this referent is inanimate and because of the way in which this algorithm is set out not to concern ni-marked inanimate objects, these ellipses are not considered in [s5].
However, better processing and translation require this element to be incorporated, and this is another task for the future. Note that kazoku 'family' is a reiteration of 'd' argument, i.e. 'my wife and children'. A mechanism to recognise the two expressions as being coreferential needs to be developed in the future. Levinson's model of 'the semantic content hierarchy (§2.4.1) would be appropriate for this. For the moment, kazoku is manually encoded as 'd'. Hence, the salient referent list [s5] is as follows:

Salient referent list: [s5]  {T1\textsubscript{a}: watashi (TopSB; first person) >  
T2\textsubscript{d}: kazoku / tsuma & kodomo (SB; third person; [IG])}

Once kazoku-wa is rejected as a new topic, it is not the referent for the two ellipted subjects, and hence T1 'a' is chosen, first person, from the salient referent list [s5]. This selection is verified by the fact that the use of yoo in Clause 2 denotes a subjective act, hence the subject is indeed first person. As explained in §3.4.2, the imperfective verb kangaeteita 'was thinking' in Clause 3 can be used for either first person or non-first person. As for the ellipted genitive, kazoku is an in-group term without honorifics, hence the genitive is first person, which further supports the selection.

Core structure:  
\[
[\emptyset \text{a-d-wa ... }]_1 \quad [\emptyset \text{a ... }]_2 \quad \text{3/comp} \quad [\emptyset \text{a ... } 4. \\
\]
Grammatical relations:  
Gen Contrastive SB SB SB

家族は反対するだろうから、どのように説明しようかと考えていた。

[[\text{a}_d \text{ Kazoku}_d-wa \ hantaisuru \ doroo \ kara,]_1 \\
Gen family[IG]-Contrastive SB oppose will because 
[\text{a}_a \text{ donoyooni setsumeishi yoo ka}]_2 \to]_3 \text{\a}_a \text{kangaeteita}.4 \\
SB how explain Voli Q Comp SB thinking 
'Because (my) family will oppose (to it), (I) was thinking how (I) can explain (it).'</n
[s6] has the following salient referent list, core structure, and semantic attributes of ellipses:

Salient referent list: [s6] {T1: watashi (TopSB; first person) > T2: kazoku / tsuma & kodomo (SB; third person; [IG]) > T3: tsuma (IO; third person, [IG])}

Core structure: [ø ø e-ni ... DS]₁ ø ø ø ... {inverse}.₂

Grammatical relations: SB Gen IO SB IO

Semantic attributes of the ellipses: human

T1 'a' is applied to the subject ellipsis by following Step 6, and therefore also to the genitive in Clause 1 by following Step 6-5. In Clause 2, however, the inverse verb is used, so that, by following Step 7-1, the subject and the indirect object are inversed for that clause. This is reinforced by the DS marking in Clause 1. Referent identification of Clause 2, however, poses another problem. It is a clause with multiple ellipses. Therefore T2 must be selected for the object ellipsis, but the true referent is in fact T3. Because T2 and T3 are both human, Steps 7 and 8 will not be able to reject the selection of T2. World knowledge may provide the ultimate solution; when one speaks to someone, it is expected that that person replies. I have to leave it for the moment, and take the correct interpretation as follows:

妻に話すと、簡単に同意してくれた。

[ø a ø a Tsuma-e-ni hanasu to.]₁ ø ø ø a kantanni dooishi te kureta.₂

SB Gen wife-IO say when[DS] SB IO easily agree and gave[Inverse]

'When (I) told (my) wife, (she) agreed (with me) easily.'

7.2.2.2 Text 3: Honorifics

Since honorifics are used only in formal registers and appear only in particular genres, they have not come up in the earlier texts, and hence have not been yet explained. Texts with honorifics call for specific mechanisms to be brought into
play, which, for the sake of simplicity, have not been included in the current algorithm. In this subsection, referent identification using honorifics is demonstrated in order to examine these mechanisms within the whole process of referent identification. Text 3 below is an extract from a personal letter which demonstrates the use of honorifics in identifying referents.

Text 3 [s1]
お元気でご活躍のこととお慶び申し上げます。


SB Hon-good health and[SS] SB Hon-doing well Gen Nomz
to [₄ ø?] o-yorokobi mooshiage masu.₅
Comp SB Hum-happy Hum-speak Pol

'(I) am happy that (you) are in good health and doing well.'

In this text, first and second persons are not expressed overtly at all. In fact, there is no overt expression with a human referent at all. Speech act participants are deictic (exophora, see §1.5.1), so that they do not require an overt expression of the referent in context. As this is the initial sentence in Text 2, and does not have an overt topicalised argument, according to Step 6-1, first person is supplied, and listed it on the salient referent list [s1] as T₁ 'a'. Following Step 6, T₁ 'a' (first person) is applied to all the subject ellipses at this stage.

This is checked against Step 8-3 honorifics. In Clauses 1 and 2, the verbal predicates have subject honorific forms, leading to the rejection of the first person as the subject referent here. On the other hand, the verbal predicate in Clause 5 is a non-subject honorific, so that first person is qualified to be the subject referent. Clauses 1 and 2 are conjoined by a SS particle, so that they have the same subject. Since this is a letter, it is assumed that the writer addresses sentences to the reader.
(i.e. second person), so that second person is often ellipted without its overt expression anywhere in the text, just as first person is. Thus, second person is applied to the subject ellipses in Clauses 1 and 2. Since Clauses 1 and 2 are subordinate clauses, the subjects there cannot be the topic, hence they are non-topicalised subjects and listed as T2 (second person). On the other hand, the subject in Clause 5 (first person) is in the matrix clause, so that it is chosen to be the topic and listed as T1.

Accordingly, the following salient referent list and the core structure are created for [s1], and [s1] is interpreted:

Salient referent list: [s1]  {T1 a: watashi (TopSB; first person) > T2 b: anata (SB; second person)}

Core structure:

Core structure:    [[[ø b ... SS]1 [ø b ... ]2]3/Comp ø a ... 5

Grammatical relations:  SB  SB  SB

お元気でご活躍のこととお慶び申し上げます。

[[[ø b o-genki de]1 [ø b go-katsuyaku]2 no koto]3 SB Hon-good health and[SS] SB Hon-doing well Gen Nomz
to]4 ø a o-yorokobi mooshiage masu.5 Comp SB Hum-happy Hum-speak Pol

'I am happy that (you) are in good health and doing well.'

[s2]

先日は、鈴木先生にお話を伺う機会を作ってくださり、感謝しております。

Senjitsuwa,  [[ø a Suzuki-sensei ni o-hanashi-o ukagau]1/reOB kikai/2-o the other day SB -Professor to Hon-talk-OB listen[Hum] chance-OB ø b tsukutte kudasari.]3 ø a kanshashite orimasu.4 SB make give[Hon][Inverse] SB thank be[Hum]

'I am grateful that (you) arranged the opportunity (for me) the other day where (I could) listen to Prof Suzuki's talk.'

Text 3 [s2] has the following core structure, the semantic attributes of the three ellipses, and the salient referent list:

Core structure:    [[[ø? c-ni d-o ... ]1/reOB ]2 [ø? ... {inverse}]3 ø? ... 4
Grammatical relations: SB IO OB SB

Semantic attributes of the ellipses: human

Salient referent list: [s2]  
{T1a: watashi (SB; first person) >
T2b: anata (SB; second person >
T3c: Suzuki-sensei (IO; third person >
T3d: hanashi (OB; inanimate)

In Clause 1, the verbal predicate shows the use of a humble form, which means a non-subject honorific, hence the referent is first person 'a'. Note that the honorific prefix on the object in Clause 1 is used to show respect towards the modifying argument 'talk' given by the honourable professor. In Clause 3, the verbal predicate shows the use of an honorific form, which means a subject honorific, hence the referent is 'b', which is verified by the use of the inverse verb. In Clause 4, the verbal predicate shows the use of a humble form, which means a non-subject honorific, hence the referent is 'a'. Thus, the core structure now looks like the following and the interpretation of [s2] is given below:

Core structure: [[ø a c-ni d-o ... ]1/reOB ]2 [øb ... ]3 [inverse] 4.

Grammatical relations: SB IO OB SB

先日は、鈴木先生にお話を伺う機会を作ってくださり、感謝しております。

Senjitsuwa, Suzuki-sensei ni o-hanashi-o ukagau to the other day Prof Suzuki’s talk.

't(I) am grateful that (you) arranged the opportunity (for me) the other day where (I could) listen to Prof Suzuki's talk.'

7.2.2.3 Text 4: Reconstructed existential constructions

Text 4 considers referent identification for restructured existential constructions. As discussed in §4.5.4, some sentences with inverse alignment are
restructured into the existential constructions using either an existential verb or inverse verb in the following ways:

<table>
<thead>
<tr>
<th>Existential constructions:</th>
<th>S_m</th>
<th>O_l</th>
<th>V</th>
<th>→</th>
<th>Obl_{ni}h</th>
<th>Obl_{kara}m</th>
<th>S^{#}_{IA} V_i[existential/inverse]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

'\(S^{#}_{IA}\)' denotes that this subject is a nominalised inanimate subject derived from either the direct object or the transitive verb in the underlying structure.

Following the principle of direct alignment, a sentence with direct alignment is expressed using a transitive sentence (1a). On the other hand, a sentence with inverse alignment expressed using a transitive sentence (1b) is unacceptable unless the inverse verb is used, and expressed as existential constructions using either an existential verb (1c) or inverse verb (1d):

(1a) \([1->3]\) Direct alignment

私は友だちを誘った。

\(\text{Watashi-wa tomodachi-o sasot-ta.}\)

'I invited a friend.'

(1b) \([3->1]\) Inverse alignment

友だちが私を誘った。

* \(\text{Tomodachi-ga watashi-o sasot-ta.}\)

'A friend invited me.'

(1c) (= 1b) Existential verb

私に友だちから誘いがあった。

\(\text{Watashi-ni tomodachi-kara sasoi-ga at-ta.}\)

'(Lit.) An invitation from a friend exists for me.'

(1d) (= 1b) Directional inverse verb

私たちから誘いがきた。

\(\text{Watashi-ni tomodachi-kara sasoi-ga ki-ta.}\)

'(Lit.) An invitation came to me from a friend.'

Referent identification for these restructured existential constructions poses a problem, because salient referents are expressed by the oblique. This means that they are listed low in the salient referent list, which sorts arguments according to their grammatical relations. Because of the way in which the algorithm is composed to deal with the identification of multiple ellipses (Step 6-4), referents for ellipses are
selected in descending order from the highest listed argument. This system works adequately for most sentences, but not for these restructured existential sentences, so that it was not included in the process of the algorithm. Here, I merely demonstrate the problem by processing a natural text (a personal e-mail), and a solution must be left for the future.

Text 4  [s1]

I heard that there was a call for me from that person.'

This initial sentence does not have an overt topicalised argument, hence, according to Step 6-1, first person is applied as referent for the ellipsis. This is reinforced by the fact that soo desu is also conventionalised to mean 'I hear', i.e. first person subject. Hence, first person is listed in the salient referent list [s1] as T1 'a':

Salient referent list: [s1]  {T1a: watashi (TopSB; first person) >
   T2c: denwa (SB; inanimate)>
   T3b: sono hito (Obl 'from'; third person)}

The referent for the ellipsis in Clause 3 is chosen to be 'a' on the basis of Step 6. For the two ellipses in Clause 1, we can implement somehow that the argument (to) is higher in saliency than the argument (from). This implementation will be adequate for choosing the correct referents, for there are no other arguments left in the list for this sentence. But if there is a high argument in the list, for example, the object, then it could pose a problem, particularly in view of the fact that the
arguments 'to' and 'from' are not restricted to human but any human related nominals, such as an organisation or work place.

[s3]
その後、その人からファックスが来ていないから、もし、何か連絡があったら、教えてください。

[Sonogo, θa sono hitoθ-kara faxθ-ga kite nai kara,]1 after that, to that person-from -SB come Neg because
[moshi, θe θb nanika renrakuθ-ga atta ra,]2 if to from anything contact-SB was if give[Inverse]

'(lit.) After that, because no fax has come from that person, if there was any contact, please let (me) know.'

'After that, because that person hasn't faxed (me), if (he) contacts(you), please let (me) know.'

[s3] raises the problem of hortative clauses used with conditional clauses. Up to Clause 1, the direction is 'from that person to me'. However, Clause 3 is a hortative clause which is expressed by the inverse verb, the subject must be second person. This affects the interpretation of the conditional clause in Clause 2, and changes the direction to 'from that person to you'. If Clause 3 was shirasemasu 'I'll tell you', then Clause 2 would have remained as 'from that person to me'. This is an added complication to devising an algorithm that is more comprehensive.

7.2.3 Undercoded sentences
Undercoded sentences are such as those seen in the sentence [s10] in Text 1. As we have observed, the interplay of wa and ga plays a major role in referent identification, and this constitutes the major part of the algorithm. However, in such undercoded sentences, an argument, predominantly a subject, is ellipted where overt representation is expected. As a result, they do not conform to the expected discourse devices, and hence the reading from the discourse devices fails. Such undercoded sentences do sometimes occur in natural texts. As discussed in §1.7.1, whether an argument is made overt or covert in production depends on the speaker's subjective decision based on his assumption that the addressee has sufficient background knowledge to understand what the speaker is saying (Du Bois 1980,
Chafe 1987, Gundel et al. 1993). In other words, an argument is ellipted usually when the speaker believes that other forms of cues are in the sentence or context to determine its referential identify.

Undercoded sentences are divided into two types depending on the type of cues employed in filling in the missing information. One type is where the cues derive from the predicate devices in the sentence. These are adequately accounted for by the algorithm, as seen in the analysis of Text 1, and are demonstrated again below. The other type is where the cues rely on world knowledge and the information accumulated up to the sentence in question. This type of undercoded sentences cannot be handled at this stage and is separately discussed in the next subsection.

The following are examples, drawn from a range of sources, of undercoded sentences whose referents can be recovered using the cues derived from the predicate devices in the sentence.

(2) さっきからスキーを探しているのだけれど、いつもの所にないんだよ。

\[
\begin{align*}
\text{SB} & \text{ for a long time ski-OB looking for Nomz Cop but,} \\
\text{SB} & \text{ usual place-Loc Neg Nomz Cop SFP} \\
\end{align*}
\]

'I've been looking for the ski, but (it) is not there in the usual spot.'

As stated in the algorithm Step 6-1, if the sentence is a first sentence with no salient referent list (i.e. no prior mention of any referent) and an ellipted subject appears, then apply first person as the referent. (2) has two ellipted subjects. This selection is verified by the verbal semantics in Step 8-1 for Clause 1. On the other hand, for Clause 2 this selection, first person subject, is invalidated, because the verbal predicate selects an inanimate referent. Given the overt object ski in Clause 1, however, the referent for the ellipsis is easily retrieved as this object, though ski changes its grammatical relation from the object to the subject in Clause 2. This also highlights the point made earlier in the explanation of the algorithm that the saliency of a referent in the salient referent list has more relevance for referent
identification than the matching of grammatical relations between ellipsis and overt antecedent.

An analogous example is the string of sentences presented in the introduction of this thesis, the one which was composed by a learner of Japanese:

(3) シドニーに行った。とても良い所だ。行かなければならない。

Sydney  to went  very  good place Cop  go must
'I went to Sydney. (It) is a very nice place. (You) must visit (there too).'

In the second sentence, because the same subject is not retained from the initial sentence, it would have been easier to process if the subject was made overt, as shown in (3a) below. However, it still makes sense, because the predicate selects a place to be the subject, and Sydney is a suitable choice. It just takes more time to go through the extra step in the algorithm to find the correct referent. However, the third sentence is incomprehensible, because the topic is changed again without overt mention, and the subject referent has not been mentioned anywhere at all, so that there is no way the verbal semantics can select a referent from the available salient referent list. If the third sentence had another cue, for example, the honorific form irassharuto ii, then it could be identified as the second person subject. (3a) is an example of expressing the logical contents of (3):

(3a) シドニーに行った。シドニーはとても良い所だ。あなたも(いつか)行くといい。

Sydney  ni itta.  Sydney-wa totemo yoi tokoro da.  Anata-mo (itsuka) ø  iku to ii.
'I went to Sydney. Sydney is a very nice place. Good if you visit (there some day) too.'

The next sentence reveals a few different usages. The subjects are made overt in all three sentences, because the topic changes in each sentence, except for the two subjects in Clauses 2 and 3 in (4.3). In (4.3), two different subjects are ellipted, 'a' in Clause 3 and 'b' in Clause 2, and thus we are dealing with an undercoded sentence. However, the verbal semantics select the correct referents. Because (4.3) has a wa-marked argument, according to Step 6, it is initially applied to both
subject ellipses. In addition, the structure of Clause 2 and 3 is Structure (vi) [\( \emptyset \ldots \),] \( \emptyset \) which is more likely to have a SS reading than a DS reading (i.e. SS>DS) (see §3.5.4). This selection is validated for the ellipsis in Clause 3, but not for Clause 2. According to its verbal semantics, it usually takes an inanimate subject, so that the sole inanimate argument in the context, 'b', is chosen. In addition, Clause 2 is a direct quote signalled by the complementizer, so that it does not necessarily follow the discourse devices (see §5.5.1.2).

(4.1) 先生は作文を読んでいます。

Sensei\(_a\)-wa sakubun\(_b\)-o yondeiru.

'the teacher\(_a\) is reading (my) essay\(_b\).'

(4.2) 僕は心配だった。

Boku\(_c\)-wa shinpai datta.

'1sg-Top anxious was 'I was anxious.'

(4.3) 先生は読み終わると、うまいと言った。

[\( \text{Sensei}\(_a\)-wa \ \emptyset \ yomi \ owaru \ to. \)]\(_1\) \( \emptyset \) \( \emptyset \) [\( \emptyset \) umai]\(_2\) to itta.

'the teacher\(_a\) finished reading (it\(_b\)), (she\(_a\)) said "(it\(_b\) is) good." '

Furthermore, (4.3) shows a rare case of a non-subject ellipsis with overt subject, i.e. [SB \( \emptyset \) V] in Clause 1. This is caused by the fact that although in normal circumstances both subject and non-subject would have been ellipted due to the high discourse salience, because the subject contrasts with another subject in another sentence, if the subject were ellipted, the sentence would be ambiguous (i.e. the wa-marked subject in (4.2) would be the likely referent), or at least take more processing to arrive at the intended meaning.

The above examples show that the referents in undercoded sentences can be recovered, as long as the predicate devices provide cues to the correct referents. However, this requires inference and so it takes extra time to process and interpret the sentence. Undercoded sentences that rely on the accumulation of information from the previous sentences and world knowledge are examined in the next subsection.
7.2.4 World knowledge

World knowledge requires an enormous amount of information and encyclopedic knowledge, so no one has not yet been able to come up with a system to adequately deal with it in the literature at this time. At this stage, I have no developed solution to offer. Therefore, in this subsection, I merely delineate the problems posed in reference-tracking and leave the solutions for a future study.

The text analysis in this thesis revealed two types of problems arising out of a reliance on world knowledge. One is the case of undercoded sentences in which the ellipted referent should have been expressed overtly, as shown in the previous subsection. We saw such an example in Text 1 [s10], where the previous topic is still retained together with the new topic, and expressed as ellipsis.

Text 1 [s10]
私たちはただ落ちないように願っていた。
Watashi-tachi-wa tada [ø ochi nai yooni]1/Comp negattei-ta.2
1-pl-TopSB simply SB fall Neg Purp[DS] praying-Past
'Ve were simply hoping that (he) wouldn't fall.'

In terms of operating and devising an algorithm, it is relatively easy to resolve some of these problems. It is assumed in the make-up of the current algorithm that only one argument is set out as the topic at any one time. The algorithm needs to allow more than one topic, by keeping one of those topics as the default, which would solve this problem. This is done by Step 9-2 which utilises T1 argument from the previous salient referent list, and it solved the problem of [s10] in Text 1.

However, in fact, the problem is more profound than that. It may take some time to know whether or not the reading gained by following the algorithm is incorrect in fact and world knowledge is needed. Usually, the problem does not become apparent until a discrepancy between the selection of referent and the actual meaning arises, and in the meantime a chain of errors may arise. For example, in the case of [s10] in Text 1, the sentence per se without context and world knowledge does have the same interpretation as the one derived from the algorithm. Because of the way in which the algorithm is set up, the incorrect referent has the same
person/animacy as the correct referent, which makes it difficult to spot the wrong
selection mechanically. Consequently, the next salient referent list is created on the
basis of this incorrectly selected referent. Take another example:

(5) 帰るとき妻はかすかに頷き、小さい声で「気をつけて」と言ってくれた。

(sb) return when wife[Ig]-TopSB faintly nod and[ss]
(sb) small voice with 'take care' Comp say-and gave[Inverse]

'When (I) was leaving, (my) wife faintly nodded and (she) said (to me) 'Take care'.

(PHP 2.1999.91)

(5) on its own would incontrovertibly mean 'When my wife was leaving, she ... ',
which is precisely the interpretation derived from the algorithm. However, in fact
the sentences previous to (5) set out a context that the wife is sick in hospital and her
husband is visiting her, which blocks that interpretation.

It is when context and world knowledge provide information to the contrary
that we have to look for other referents for ellipsis. It is easy for humans to
recognise the need for world knowledge, but to incorporate it into a system for
machines is a difficult task. This is an enormous obstacle preventing machines from
processing such undercoded (and seemingly well-formed) sentences. This problem
will be resolved only if the building up of information from sentences with world
knowledge can be somehow implemented.

The other type of problem is interpretation which requires an accumulation of
information over sentences with world knowledge, so called 'learning' function.
For example, we observed in Text 1 [s9] that if 'g' is making upward steps with 'l',
they must be both climbing up. In Text 1 [s11] we also observed the need to map
futari 'two people' onto 'g+l'. This type of problem may be less problematic than the
first, if more detailed linguistic information were implemented.

7.3 Evaluation of the algorithm

While I believe that the basic structure of the algorithm is solid, a number of
details have to be refined. I have pointed out the areas which need improvement.
Moreover, the algorithm was tested on small texts. Although overall the algorithm was close to being adequate in resolving ellipses in these texts, a large corpus analysis (i.e. larger texts and more texts) is imperative before the algorithm is fully evaluated, and this would be the next step in this line of research.

I will now make a brief comparison of my analysis to the two models in the literature, reviewed in Chapter 2: one by Kameyama (§2.5.2) and Nakaiwa et al. (§2.5.3). Ideally, the most explicit way of comparing these models with my model would be to test each model against the same text. However, this is not possible for the following reasons.

Kameyama's model is claimed to utilise two theories: Lexical Functional Grammar to account for grammatical aspects of ellipsis resolution and the Centering Theory to account for discourse aspects. Then, each referent candidate selected by the Centering Theory is validated by the inference components such as world knowledge. However, the entire process was not instantiated in her work. Above all, her model only accounts for simple sentences. As shown in this thesis, there are a lot more complex sentences than simplex sentences in natural texts (87.5% of sentences are complex sentences in my corpus), and these complex sentences require additional mechanisms for ellipsis resolution. For these reasons, I cannot test Kameyama's model on the same texts used in this thesis for comparison.

The model by Nakaiwa et al. contains many unclear parts, so that explicit comparison is very difficult. I make a comparison merely based on their algorithm (Nakaiwa and Ikehara 1995:101), which was presented in §2.5.3.2, and again quoted here for convenience.

[Step 1]
Detection of ellipses.
If they exist, examine the type of sentence that is being analysed now.
If the sentence is a complex sentence, proceed to step 2.
If the sentence is a simple unit sentence, proceed to step 3.

[Step 2]
Resolution of ellipses in a complex sentence will be conducted in the following order.
1) intrasentential resolution of ellipses using the types of conjunctive particles, verbal semantic attributes and modal expressions.
2) intrasentential resolution of ellipses using the types of conjunctive particles. If their antecedents can be found, finish the resolution process. Else, proceed to step 3.

[Step 3]
If the sentence currently being analysed includes an embedded or quoted sentence, intrasentential resolution of ellipses using verbal semantic attributes will be conducted.
If their antecedents can be found, finish the resolution process. Else, proceed to step 4.

[Step 4]
Examine whether there are antecedents in other sentences within the text. If their antecedents can be found, finish the resolution process. Else, proceed to step 5.

[Step 5]
Extrasentential resolution of ellipses using verbal semantic attributes, modal expressions, and the types of conjunctive particles is conducted. If their antecedents can be found, finish the resolution process. Else, proceed to step 6.

[Step 6]
If referential elements cannot be found and translation in the passive voice can be done, translate it into the passive voice, else based on the semantic restrictions imposed on the ellipsis by the verbs, and deductively generate anaphora elements.
Finish the resolution process.

I focus attention now on complex sentences, dealt with in Step 2 of the algorithm. The model by Nakaiwa et al. utilises the following categories: types of conjunctive particles, verbal semantic attributes and modal expressions (equivalent to epistemic morphemes in this thesis). These categories are generally adequate to resolve the identity of ellipsis. However, as pointed out in §2.5.3.2, the model by Nakaiwa et al. does not recognise that the readings from conjunctive particles and modal expressions can be overridden in subordinate clauses and under other conditions. This may cause problems.
In terms of conjunctive particles, as shown in §3.5.1, the interpretation derived from the conjunctive particles is susceptible to other means which also provide the interpretation of sentences. When an analysis is set the interpretation derived from the conjunctive particles as the basic information, the interpretation can be overridden by other means. However, as this analysis has shown, when an analysis bases the interpretation derived from the discourse devices, then the interpretation from the conjunctive particles reinforces that interpretation; and in the case of [s10] in Text 1, it in fact detected even the incorrect interpretation.

In terms of modal expressions, for example, for Text 1 [s7], the use of volitional form *yoo* in Clause 2 will automatically make the subject first person, though other mechanism in ALT-J/E may be able to compensate and make the correct selection of referent for the ellipsis (I do not have the means to test this sentence using ALT-J/E).

Text 1 [s7]
そのことに心を打たれて、自分ももう一度自分の夢を実現させようと決心した。

\[\text{[ơ}_g \text{ Sono koto ni } \text{ơ}_g \text{ kokoro}-o \text{ ut-are te,]}_1 \]
\text{SB that thing by Gen heart-OB move-Pass and[SS]}
\[\text{[jibun}_g \text{ mo moo ichido jibun}_g \text{ no yume}-o \text{ jitsugen sase } \text{ yoo}_2 \text{ to } \text{ơ}_g \text{ kesshinshita.]}_3 \]
\text{self also-SB more once self Gen dream-OB come true Caus Voli Comp SB decided}

'(He\text{g}) was moved by that, and (he\text{g}) decided that (self\text{g}) also wanted to try again to make (his\text{g}) dream come true.'

Finding antecedents within the sentence is relatively less problematic, since the referent is often located close by in the conjoined clause. However, finding them outside the sentence in question may pose further problems, since there may be more than one referent with the same salience (for example, two third person arguments), particularly in view of the fact that the model by Nakaiwa et al. does not recognise the importance of the *wa*/*ga* distinction and does not explain their system for keeping track of referents, the function executed by the salient referent list in this thesis. This may pose a problem identifying the ellipses, for example, in Text 1 [s7]. The context for [s7] has two different third persons: *sono hito* 'that person' and *Hugh*. Verbal semantics cannot differentiate these two referents under this circumstances.
Again, critical comparison is difficult, given the fact that the details of the model by Nakaiwa et al are unclear and I cannot test sentences using ALT-J/E.

7.4 The generalisation for ellipsis resolution

As this is the final section in this thesis, I summarise my major findings. An interplay of three linguistic devices constitutes the key to ellipsis resolution:

- **Sentence devices** govern which argument is to be expressed as the subject. They induce the principle of direct alignment, i.e. SB > non-SB, and also the principle of ellipsis which makes the subject most prone to ellipsis.

- **Discourse devices** govern the interaction of the *wa/ga* markers which provide the default interpretation for ellipsis.

- **Predicate devices** are like subject-verb agreement in a loose sense, signalling the referential identity of subjects on the predicates. In actual processing, they normally function as additional cues about the referential identity of subject, verifying the reading derived from the discourse devices and the sentence devices. This multiple layering of devices is able to deal with range of sentences and is capable of retrieving referents for ellipses more accurately.

A generalisation regarding ellipsis resolution and the way in which the algorithm is composed is as follows: the interaction of *wa* and *ga* (i.e. the discourse devices) provides the initial reading as default, while the other features outlined in Step 8 (i.e. the predicate devices) provide additional cues for verifying that reading. The sentence devices are incorporated in the make-up of the discourse devices in choosing an argument for the subject. Since Japanese is an SOV language, it is intuitively tenable from the perspective of language processing that the interplay of the subject related elements *wa/ga* gives initial cues for anticipation of what may be the referent (i.e. the discourse devices first), and then this default interpretation is validated or denied, or even supplemented in the case of undercoded sentences, by the cues from the predicate devices which appear in final position (i.e. the predicate devices second). In addition, the readings from subjects (i.e. the *wa/ga* distinction)
can be utilised in nearly every sentence. On the other hand, the features in the predicate devices do not appear in every sentence (except verbal semantics), and the readings from the predicate devices can be overridden in, for example, subordinate clauses and past tense, so that it makes more sense to treat the readings from the discourse devices as the default.
The main aim of this thesis was to elucidate concretely and precisely the mechanisms of referent identification for ellipted arguments in which the Japanese grammar is organised and ellipsis operates, and to refute the commonly held view in the literature that referent identification for ellipsis predominantly resides in such elusive ideas as 'context', 'sociolinguistic variables', and even 'intuition' (though I do not deny that some referent identification depends on world knowledge). In order to achieve this aim, I presented a detailed description of the linguistic mechanisms for ellipsis resolution. Then I devised an algorithm based on these mechanisms to provide a clear representation of how the referential identity of ellipted arguments can be tracked, and exemplified its operation on naturally occurring texts.

The areas in which this thesis has made a contribution to the topic of ellipsis resolution are four-fold. Firstly, my model analyses ellipsis resolution from all sub-fields in linguistics (except phonology, because spoken texts are not examined in this thesis). The predicate devices utilise morphology and semantics, the sentence devices utilise syntax, and the discourse devices naturally utilise discourse structure, particularly topic continuity. There have been a number of works in the literature on the mechanisms of ellipsis, but each accounts for the topic utilising only one or two sub-fields in linguistics capturing some facets of the mechanisms of ellipsis, for example, from discourse perspective. There has not been a work, to my knowledge, which tackled this problem by integrating all the above sub-fields. Secondly, I introduced the principle of direct alignment and the principle of ellipsis which explicitly capture fundamentals of Japanese grammar illuminating some key aspects of Japanese word order along the way, and underling the importance of person and animacy alongside the more familiar role of grammatical relations in determining word order in Japanese. I have shown how these principles originate from typologically familiar features, such as animacy, inverse systems, and discourse salience. Thirdly, the mechanisms of ellipsis
are summarised in an algorithm, which can provide a clear and explicit representation of the entire process of reference-tracking in detail, which also had to incorporate various other mechanisms that language possesses. Fourthly, the algorithm was tested against naturally occurring texts involving discourse (not just against isolated sentences) from several different texts.

While I believe that I have identified the primary linguistic mechanisms for ellipsis resolution in Japanese, my analysis is by no means comprehensive or exhaustive. On the contrary, the description of the linguistic mechanisms and the algorithm needs a number of revisions and refinements. I have indicated a number of areas which require further investigation. This reveals the exquisite complexity and subtlety that pervade the mechanisms of ellipsis and language as a whole. Referent identification for ellipted arguments involves a number of language variables, including arbitrary components of language and human errors, as well as extra-linguistic factors, in order to fully comprehend its mechanisms. I hope this study has advanced the understanding of mechanisms of ellipsis.

Many languages in the world, particularly in Asia, utilise ellipsis abundantly. Since Japanese exploits ellipsis to such a spectacular extent without using such commonly known devices as cross-referencing systems and verbal inflections, I hope this study has illustrated a number of novel mechanisms for referent identification, and shed light on possible mechanisms of ellipsis resolution in other languages.

Finally, I hope my findings will help learners of Japanese to improve their fluency on an area in which they have never been formally taught before. I am particularly hopeful that this study will further advance and be utilised in machine translation systems some day. With the rapid advancement of information technology today, our knowledge and understanding would go far beyond what we are capable of now, if we could read information (for example, on internet) in any language we require through easy access to translation. For this, linguists ought to make a significant contribution to the world.
References


Aissen, J. 1997. *Agent focus and inverse in Tzotzil*. ms


——. 1998. *Zero arguments in Jiwarli, Western Australia*. ms


——. 1998. *High ranking patients*. hand out for the talk on 4/6/1998 at La Trobe University Australia


Dik, S. 1978. *Functional grammar.* Amsterdam: North-Holland


1995. Towards an understanding of linguistic evolution and the notion 'X has a function Y'. In Abraham et al (eds.). 275-308


Fox, B. 1986. Local patterns and general principles in cognitive processes: Anaphora n written and conversational English. Text 6.1.25-51


______ 1986. Towards a computational theory of discourse interpretation. MS SRI International AI-Center and University of Pennsylvania


______ 1983. Referential tracking in Nunggubuyu. In Haiman & Munro (eds.). 120-150


Ikegami, Y. 1981. 'Suru' to 'naru' no gengogaku (Linguistics of 'Doing' and 'Becoming'). Tokyo: Taishukan


Kuno, S. 1980. 'Discourse deletion'. *Harvard studies in syntax and semantics*. 3.1-144


Miyagawa, S. 1996. Japanese word order is not so flexible. The proceedings of *Formal Approaches to Japanese Linguistics* 2. 18-19


Nariyama, S. 1996. Subject ellipsis in English conversation. ms


National language research institute of Japan (Kokuritu Kokugo Kenkyusho). 1955. Danwano jittai (Study of discourse), Tokyo


______ 1990. The languages of Japan. Cambridge: CUP


______ 1983. Towards a computational theory of definite anaphora comprehension in English discourse. MIT AI Lab


**Corpus**


*Jinken* (Human rights) from an article in a local newspaper *Seikachoo shinbun*. 2.1999

Appendices

Algorithm

Identifying existence of ellipses

Step 1: Parse the sentence into finite clauses.
Step 2: Check the valency of the verbal predicate for each clause, and create a description of the core structure of the sentence.
Step 3: If ellipses (unfilled arguments) are detected, describe the semantic attributes of each ellipsis.
Step 4: Store the information of the overt arguments gathered in Step 2 in Salient referent list as input information.
Step 4-1: If this sentence is not the first sentence, update the current Salient referent list by incorporating the previous Salient referent list.
Step 5: If ellipses are described in Step 3, go to Step 6. Or else take the next sentence, or else, end the operation.

Identifying referent for the ellipses:

Step 6: Apply T1 argument in Salient referent list as the referent for the ellipses.
Step 6-1: If it is the first sentence in the text and has no wa-marked referent in Salient referent list [s1], apply the first person or generic referent.
Step 6-2: If the sentence is a complex sentence and has a ga-marked subject, and the adjacent clauses form a monoclause, then apply that ga-marked referent.
Step 6-3: A missing argument in a relative clause is coreferential with the head of the relative clause.
Step 6-4: If the sentence has multiple ellipses within the same clause, apply T1 from Salient referent list to the highest ranked ellipsis in terms of Salient referent order list, T2 for the next highest ellipsis, T3 for the next highest ellipsis, and so forth.
Step 6-5: If the sentence has an ellipted genitive, it is coreferential with the
subject of that clause.

Step 6-6: If the sentence has the reflexive pronoun, it is coreferential with the subject of the clause, or in the case of a complex sentence, the matrix subject.

Step 6-7: If the sentence has a low-transitive clause with an ellipted subject, it is coreferential with T1 argument, unless the referent has been selected in the preceding substeps.

Verifying the selection:

Step 7: Verify the selected referents in Step 6 with Sentence devices.

Step 7-1: If an inverse verb is found, it is reversed for that clause.

Step 8: Verify the selected referents in Step 6 with Predicate devices:

Step 8-1: Semantic attributes of the selected referents with those of the ellipses created in Step 3.

Step 8-2: Check Switch-reference

Step 8-3: Check Honorifics

Step 8-4: Check Epistemic morphemes

Step 9: If the selected referents agree with the selection in Step 7 and Step 8, process the next sentence, or else, end the operation.

Step 9-1: If a mismatch arises, go back to Step 6, select the next referent down in Salient referent list, and repeat the process in Step 7 and Step 8.

Step 9-2: If the mismatch is not resolved, take the T1 argument from the previous salient referent list [n-1].

Step 9-3: If the mismatch is still not resolved, then consider world knowledge.
Text 1:  

「Human rights' (Seikachoo Shinbun 2.1999)

[s1]
私は先週の土曜日ほとんど寝ないでテレビを見続けた。

'Watashi-wa senshuu no doyoobi hotondo ne nai de]1  o_a terebi-o mi tsuzuketa.2
1sg-TopSB last week of Saturday hardly sleep Neg and[SS] SB TV-OB watch continued

'Ia hardly slept last Saturday, instead (Ia) kept on watching TV.'

[s2]
なぜかというと、私は剛のファンで、剛がマラソンに挑戦するので、応援したかったからだ。

Nazekato iu to, [watashi-wa GooŚ-no fan de,]1
why say if 1sg-TopSB -Gen fan Cop[SS],
[GooŚ-ga marason-ni choosensuru node,]2 [o_a o_c ooenshi takatta]3
kara da.4
-SB marathon-Obl challenge because[DS] SB OB cheer wanted because Cop

'The reason was because I'm a fan of GooŚ and (Ia) wanted to cheer for (himŚ), as GooŚ was challenging the marathon.'

[s3]
その中でたくさんの感動する場面を見た。

ø_a sono nakade takusanno kandosuru bamen-d-o mita.1
there inside many moving scene-OB saw

'(Ia) saw a number of moving scenes on (TV).

[s4]
特に、障害をもつ人たちが、自分の夢に挑戦し、あきらめないで努力して夢を実現していく姿がとても心に残った。

Tokuni, [[[ ø_e shoogai-z-o motsu]1/reSB hito-tachi-e-ga, jibun-e-no yume-ni choosenshi-o]2
specially SB disability-OB have person-pl-SB self-Gen dream-Obl challenge-and[SS]
fakirame nai de ø_e doryokushi te,]3 [ø_e ø_e yume-t-o jitugenshi-teiku]4/5/reOB
give up Neg with SB effort and[SS] SB Gen dream-OB fruition-Impf
sugata-ga o_a totemo kokoro-ni nokotta.6/LT
scene-NomOB SB very much mind-Loc left

'(I\textsubscript{a}) was especially impressed with the scene where people\textsubscript{e} with disability followed (their\textsubscript{e} own) dreams, (they\textsubscript{e}) tried without giving up, and (they\textsubscript{e}) realised (their\textsubscript{e}) dreams.'
(lit. for the matrix clause:  '(I\textsubscript{a}) got left in (my\textsubscript{a}) mind with the scene that .... ')
両足が不自由になり、以前にやっていたロッククライミングをあきらめた人がいた。

There was a person who gave up rock-climbing which (he) used to do, after both of (his legs) became disabled.

ある日、その人は、雑誌を眺めていたら、外国人の両足のないヒューさんがロッククライミングをして成功していることを知った。

One day, while (he was) reading a magazine, the person found out that Hugh, a foreigner with no legs, had attempted rock-climbing and (he had) succeeded (at it).

そのことに心を打たれて、自分ももう一度自分の夢を実現させようと決心した。

'(He) was moved by this, and (he) decided that (self) also wanted to try once more to make (his) dreams come true.'
'So, (he$_g$) practiced every day, and finally one day, the time came (for him$_g$) to make (his$_g$) dreams come true.'

[Terebi-o tooshite [H Hughes to isshoni ashi-o ippo ippo chikara-zuyoku]
TV-Obl through SB Hugh-Mr with together foot-OB one step powerful maeni dashi-te,]
slowly upward climb-and go scene-OB
$\sigma_g$ watashi-tachi-m-ni mise te kureta.
SB 1-pl-IO show and gave
'(lit.) (Heg) showed us a scene via TV where (he$_g$) made powerful upward steps one by one with Hugh$_i$, as (he$_g$) slowly kept climbing up.'

Watashi-tachi-wa tada [ochi nai yooni] Comp simply SB fall Neg Purp[DS] praying-Past
'We$_m$ were simply hoping that (he$_g$) wouldn't fall.'

[futari-wa choojoo made tadoritsuku koto] 2-ga $\sigma_p$ dekita.
two people-TopSB summit to arrive Nomz-NomOB SB could
'After (they$_p$) took (their$_p$) time, (the two of them$_p$) finally made it the summit.'

Watashia-wa [[ashi no fuiyuuna hito$_f$ demo ano kewashii iwahada$_s$-o]
lsg-TopSB legs of disabled person even-SB that steep bare rock-OB
'Private: (there$_p$) were two people to whom I showed a scene in which (he$_g$) slowly kept climbing up with Hugh$_i$, as (he$_g$) made powerful upward steps one by one. (lit.) (Heg) showed us a scene via TV where (he$_g$) made powerful upward steps one by one with Hugh$_i$, as (he$_g$) slowly kept climbing up.'
noboru koto[1]-ga dekiru na nte[2] sugoi[3]/Comp to omotta.4
climb Nomz-NomOB can Cop Nomz amazing Comp

'I thought it was amazing that even people with disabled legs could climb up such a rocky mountain.'

<s13>私は、このテレビを通して、自分の夢を持つことと、夢へ向かって努力することの大切さを学びました。
Watashi-wa kono terebi-o tooshite, jibun no yume-o motsu koto to, 1sg-TopSB this TV-OB through self Gen dream-OB have thing and yume e mukat-te doryokusuru koto no taisetusa-o manabimashita.
dream towards and make efforts thing Gen importance-OB learned
'I learned through this program the importance of having my own dreams and of trying to make those dreams come true.'

<s14>すべての人は人間らしく生きる権利がある、と社会で勉強しました。
Subetenohito-wa ningen rashiku ikiru kenri-ga aru, all people-Top human like live rights-SB exist to shakai de benkyo shimasita.
Comp social science in study did
'I learned in social science that everyone has the right to live as human beings.'

<s15>でも、人間らしく生きるということが、どういうことなのかよくわかりませんでした。
Demo, ningen rashiku ikiru to iukoto-ga dooiu koto nano ka but human like live Comp thing-SB what thing Cop Q yoku wakari masen de shita.
well understand Neg Cop Past
'But I didn't really understand what it meant to live as a human being.'

<s16>今、私は人間らしく生きるとは、こういうことではないかと思います。
'I think it is not this.'
'Now, I think that perhaps to live as a human being means something like this.'

'That is to say, a way of life where (you) find (your) own dreams and try to realise those dreams is what is meant by living as a human being.'

'And, when possible, helping those people who are making that kind of efforts.'

'Also, by getting help from others.'

'It is through this, I think people truly bond and are able to trust each other.'

'I am presently in the third year of junior high school and am shortly going on to high school.'
自分の夢は何なのか。

Jibun no yume-wa nan nano ka.
self Gen dream-Top what Cop Q
'What are my own dreams?'

そのことをもう一度じっくり考えたいと思います。

Sono koto-o moo ichido jikkuri kangae-tai to omoimasu.
that thing-OB more once slowly and carefully consider-want Comp think
'I would like to think about this once again very carefully.'

夢を見つけることと、それに向かってあきらめずに努力すること、この二つをちゃんと

Yume-o mitsukeru koto to, sore nimukatte akirame zuni
doryokusuru koto,
dream-OB find thing and that towards give up Neg make effors thing
'To find a dream and to make efforts in pursing that dream;
I am determined to keep these two points in mind.'

END
Author/s: 
NARIYAMA, SHIGEK

Title: 
Referent identification for ellipted arguments in Japanese

Date: 
2000

Citation: 

Publication Status: 
Unpublished

Persistent Link: 
http://hdl.handle.net/11343/39534

File Description: 
Referent identification for ellipted arguments in Japanese

Terms and Conditions: 
Terms and Conditions: Copyright in works deposited in Minerva Access is retained by the copyright owner. The work may not be altered without permission from the copyright owner. Readers may only download, print and save electronic copies of whole works for their own personal non-commercial use. Any use that exceeds these limits requires permission from the copyright owner. Attribution is essential when quoting or paraphrasing from these works.