

Chapter 2

Zero Arguments

2.1 Introduction

The Japanese language is often described as an “elliptic” language (e.g., Obana, 2000). “Ellipsis” is the omission of elements, normally required by “the grammar,” that speakers/writers assume are obvious from a given linguistic context or from relevant non-linguistic knowledge. Here, we mean by “the grammar” a set of rules governing the use of a language, which covers the levels of morphology, syntax and semantics. Ellipsis as a concept is probably a universal feature of languages. People avoid unnecessary and intrusive repetition, and leave “unsaid” what they believe is recoverable or inferable in the context or in the situation.

However, the linguistic options that realize ellipsis vary markedly. Huang (1984), for instance, classifies languages, according to the permissibility of so-called “empty categories” that are defined, in the Government and Binding (GB) framework, as referentially dependent elements that are phonetically empty, but syntactically present (e.g., Haegeman, 1994). Japanese, along with Chinese and Korean, allows for empty categories in all the following sentence forms (where *e* indicates an empty category) in (2.1), and is labeled a “cool” language.

- (2.1)
- a. *e* came.
 - b. John saw *e*.
 - c. *e* saw *e*.
 - d. John said that *e* saw Bill.
 - e. John said that Bill saw *e*.
 - f. John tried *e* to come.

In “hot” languages, including English, all but (f) are ungrammatical, and in “medium-hot” languages, such as Italian and Spanish, the sentence forms of (a), (d) and

(f) are well-formed, but (b), (c) and (e) are ill-formed. In this account, Japanese and English are placed at the extreme ends of this scale.

Kameyama (1985) presents a typology of languages in terms of “zero anaphora permissibility” and “syntactic overttness requirement” which are “two sides of a coin” (page 7). In her typology, English is categorized as Type I; it syntactically requires overt subjects for any finite verbs and objects for any transitive verbs. Japanese is placed at the other end as Type III; it allows zero-subjects/objects extensively in any person, with no obligatory grammatical encoding of its reference.

This thesis focuses on a typical realization of the “unsaidness” in Japanese, what we conventionally call ZEROS, which are triggered by syntactic/semantic gap, but are distinct in their mechanisms and behaviors from ellipsis found in another class of languages (i.e., Huang’s “medium” or Kameyama’s “Type II/IV”) that normally exhibit a rich morphological system of subject-verb agreement. The ellipsis of our concern is pragmatic in nature rather than morphological (as realized by inflection) or grammatical (as realized by switch-reference systems).¹ Hence, we consider ZEROS as a discourse phenomenon that involves structural, cognitive, and pragmatic factors in their distribution.

2.2 Key concepts

Although ZEROS are pragmatic in their distribution and behavior, they are syntactic and semantic in definition. In this subsection, we will give an overview of four key linguistic (largely syntactic and semantic) concepts: argument structure, case, headness, and definiteness, all of which are closely related to the definition and typology of ZEROS that we present in Sections 2.3 and 2.4. Here, we will initially base our discussion on the study of English, since it is a best-researched language in linguistics in general, and then attempt to apply the concepts to Japanese.

2.2.1 Argument structure

“Predicates” and “arguments” are the terms often used to characterize the units of syntactic structures. Haegeman (1994) metaphorically describes “predicates” as the script of a play and “arguments” as central roles defined by the script (and “adjuncts” as supporting parts in the play). Therefore, every predicate has its own argument structure, just as every script requires its own roles. The argument structure of a verb (as a prototypical example of predicate) determines which elements of the sentence are

¹ Huang, Yang (2000) proposed, as a working hypothesis, a novel typology of languages in terms of “pragmaticness” versus “syntacticness.” His typology classifies Japanese as a pragmatic language, along with Chinese.

obligatory and is often defined as the “subcategorization frame” in the GB framework.²

Also, argument structure is used as the common technical term for one idiosyncratic property of a word. Many works have used this notion to explain lexical properties. According to Grimshaw (1990), the term refers to “the lexical representation of grammatical information about a predicate” (page 1). Hence, argument structure explains “the syntactic behavior of a lexical item” (*ibid*, page 1).

The lexical item that specifies the argument structure is called the predicate. A prototypical example of a predicate is a verb, which usually takes a set of arguments (and also adjuncts). The verb ‘draw,’ for example, is a two-place predicate, as illustrated in (2.2). It requires two arguments: the one who does the act of drawing and the thing that is being drawn (underlined), with possible additional information, “on what” categorized as an adjunct (in parentheses).

(2.2) John **drew** a picture (on the wall).

The application of argument structure is not limited to verbals. Other syntactic categories than verbs, such as adjectives, as well, have their argument structure, as in (2.3).

- (2.3) a. Jane is **familiar** with the Japanese language.
 b. Jane is **afraid** that she may fail in the exam.

Predicative adjectives often take one syntactic argument, in addition to a subject (often called an external argument), whose surface realization includes prepositional phrases, as in (2.3a) and clauses, as in (2.3b).

The notion can be further extended to nominals. A prototypical instance of nominals that are claimed to bear argument structure is verbal nouns (e.g., Grimshaw, 1990; Haegeman, 1994; Partee and Borschev, 2003).³ Look at an example below.

² There is an important distinction between argument structure and subcategorization frame. Subcategorization frames only specify the complements of the verb, i.e., the elements that are obligatory inside the VP. The subject NP need not be mentioned in the subcategorization frame because all verbs supposedly have subjects. The argument structure, on the other hand, lists all the arguments, including the subject argument.

³ Grimshaw (1990) limits the scope of nouns that can project arguments to a subclass that she refers to as process or event nominals. Haegeman (1994) uses the noun ‘analysis’ which is semantically and morphologically related to the verb ‘analyse’ which share the same argument structures as its noun counterpart.

(2.4) a. John's **transfer**

b. the **transfer** of John (to the Tokyo Office)

The arguments of the noun ‘transfer’ are syntactically realized either by pre-nominal possessive NPs, as in (2.4a), or post-nominal prepositional phrases, as in (2.4b).

Let us turn now to the case of Japanese. Japanese exhibits the corresponding argument structures for a verb as in (2.5), an adjective in (2.6) and a noun in (2.7).

(2.5) 太郎が 壁に 絵を 描いた。
Taro-ga (kabe-ni) e-o **kai-ta.**
 Taro-NOM wall-on picture-ACC draw-PAST

‘Taro drew a picture on the wall.’

The verb *kaku* ‘draw,’ in this example, requires a nominative argument and an accusative argument, and also accompanies a locative adjunct.

(2.6) a. 花子が 英語に 詳しい。
Hanako-ga eigo-ni **kuwasii.**
 Hanako-NOM English-with familiar

‘Hanako is familiar with English.’

b. 花子は 試験に落ちるのが 怖い。
Hanako-wa siken-ni otiru-no-ga **kowai.**
 Hanako-TOP exam-in fail-NOMI-NOM afraid

‘Hanako is afraid that she may fail in the exam.’

In (2.6), adjectives, *kuwasii* ‘familiar’ and *kowai* ‘afraid’ take a *ni*-marked argument and a *ga*-marked nominalizer respectively, in addition to subject arguments.

(2.7) a. 太郎の 転勤
Taro-no **tenkin**
 Taro-GEN transfer

‘Taro’s transfer’

b.	太郎の	ニューヨークへの	転勤
	<u>Taro-no</u>	(nyuuyooku-e-no)	tenkin
	Taro-GEN	New-York-to-GEN	transfer

‘the transfer of Taro to New York’

A nominalized verbal *tenkin* ‘transfer’ has the same argument structure as its derived verb *tenkin-suru* ‘to transfer’ that requires the argument of who performs the act of being transferred, and the information about where the person is transferred is probably supplemental.

As we have seen, the distinction of argument (underlined) and adjunct (in parentheses) is often intuitively perceivable as we tentatively mark them differently, but it is not always easy to make this distinction in a principled way. Also note here that the argument structure of nouns in Japanese is normally realized by adnominal phrases that involve a genitive particle *no*, unlike English which has the options of pre-nominal possessives and post-nominal prepositional phrases, which makes clarifying the distinction even harder. We will return to this issue later in Chapter 6.

2.2.2 Case

Case is a system of marking dependent nouns for the type of relationship they bear to their heads (Blake, 2001). Traditionally, the term refers to inflectional marking, i.e., variation in morphological endings, as is found in Latin (nominative *homo*, accusative *hominem*, genitive *hominis*, etc.) In languages that lack morphological variations of this kind, the term “case” as traditionally used, does not apply. In English, for example, case is generally expressed by means of prepositions (as in ‘to Jane,’ ‘with Jane’) and word order (as in ‘Jane likes John’ versus ‘John likes Jane’); the only morphologically marked case found in English is the genitive (as in ‘John’s’).⁴

In Japanese, which lacks inflectional endings on nouns and permits relatively free word order, postpositions (in bold below) perform the function of case marking, as illustrated in (2.8).

(2.8)	太郎が	庭で	花子の	犬と	遊んでいる。
	<u>Taro-ga</u>	niwa- de	Hanako- no	inu- to	asonde-iru.
	Taro-NOM	garden-in	Hanako-GEN	dog-with	be-playing

‘Taro is playing with Hanako’s dog in the garden.’

⁴ Pronouns realize case by means of morphological variations, as in ‘he’, ‘him’, and ‘his.’

These postpositions, often called case marking particles or case markers, can be typologically classified into several groups. The first typology classifies them into two major types according to their function, whether they relate (i) a noun to a verb at the clause level, i.e., “adverbial case,” or (ii) a noun to another noun at the phrasal level, i.e., “adnominal case.”

Also, case markers are typically grouped either as “grammatical case” or as “semantic case.” The grammatical case markers represent the grammatical relations, such as subjects or objects, while the semantic case markers bear a variety of spatial, temporal or other inherent meanings.⁵ The typologies for Japanese case can be summarized as in Table 2.1 below.

Grammatical case marker			Semantic case marker	
Adverbial	NOMINATIVE	<i>-ga</i>	LOCATIVE/ALLATIVE, etc.	<i>-ni</i>
			ALLATIVE	<i>-e</i>
			LOCATIVE/INSTRUMENTAL	<i>-de</i>
	ACCUSATIVE	<i>-o</i>	COMMITATIVE	<i>-to</i>
			ABLATIVE	<i>-kara</i>
	DATIVE	<i>-ni</i>	DESTINATIVE	<i>-made</i>
			ELATIVE/COMPARATIVE	<i>-yori</i>
Adnominal	GENITIVE	<i>-no</i>	-	

Table 2.1: Typology of case markers in Japanese

Arguments marked by the (adverbial) grammatical case markers, *ga*, *o*, and *ni*, correspond roughly to subject, object and indirect object, respectively. Note, however, that the mapping from grammatical case to grammatical function is not straightforward (e.g., Ono, 1994; Tsujimura, 1996; Obana, 2000). Subjects can be marked by non-NOMINATIVE cases, as in the phenomena termed “*Ga/No* Conversion” and “*Ga/Ni* Conversion.”⁶ Similarly, a NOMINATIVE case is sometimes involved in the

⁵ Tsujimura (1996) calls the former category “case particles” and the latter “postpositions.” She argues that they share some common features; they cannot stand by themselves, and thus are always attached to NPs. They are distinct in whether or not they bear specific semantic content. Also, case particles can often be absent in casual speech, while postpositions need to be present to retain their meanings.

⁶ Examples of *Ga/No* Conversion and *Ga/Ni* Conversion from Tsujimura (1996) are presented in (a) and (b) respectively (in next page).

so-called “Double nominative construction,” in which *ga* marks object.⁷

Note also that one lexical case marker is not necessarily mapped to a single specific case role (e.g., Obana, 2000). The case marker *-ni*, for example, is notorious for its multi-functionality; it needs to be disambiguated from among DATIVE, LOCATIVE, ALLATIVE, and other functions, in the context in which it occurs.

Ono (1994) summarized this mapping issue, and Obana (2000) adopted his summary, as an annular model of the distribution of the case markers (or a circular system in Ono’s terminology). The diagram is reproduced, with some modification, in Figure 2.1.

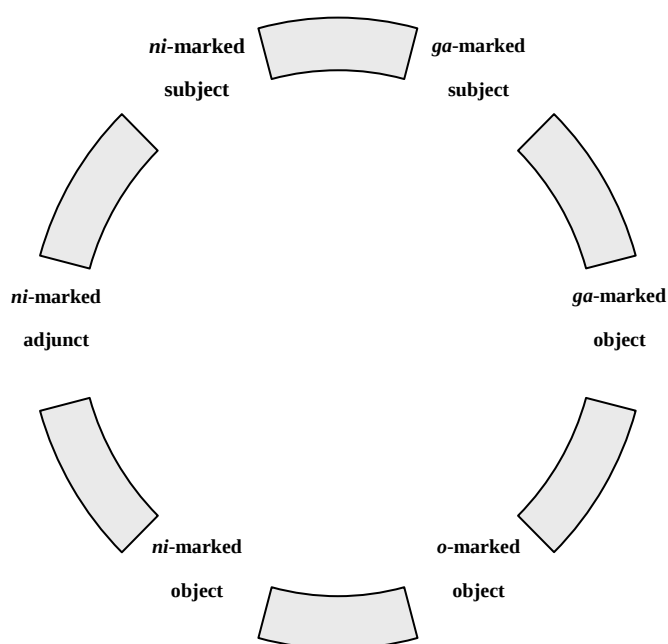


Figure 2.1: An annular model of case-to-role mapping

This model is driven by the fuzziness that lies in the mapping between grammatical

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- (a) *Taroo-ga [Hanako-ga/no kaita] e-o hometa.*
 Taroo-NOM Hanako-NOM/GEN painted painting-ACC praised
 ‘Taro praised that painting that Hanako drew.’
- (b) *Dare-ga /ni sonna koto-ga dekiru no?*
 who-NOM/DAT that sort of thing-NOM be able to do Q
 ‘Who can do such a thing?’

⁷ An example of double nominative construction also from Tsujimura (1996) is (a), in which the verb *dekiru* “be competent” marks its direct object with the nominative case particle.

- (a) *sono-gakusei-ga suugaku-ga dekiru.*
 that student-NOM math-NOM be competent
 ‘That student is good in math.’

Another verb *wakaru* “understand,” among others, may take this construction.

function and surface case. It suggests that they are not in a simple one-to-one relation, but rather form a non-discrete distribution in a circular fashion.

Another issue to be noted here is that grammatical case markers and semantic case markers are given distinct syntactic treatments in the generative framework. Semantic case markers (i.e., postpositions) are treated as a lexical category that constitutes an independent node in a phrase structure tree. Grammatical case markers, in contrast, are analyzed as part of NPs; case assignment is done by an external source, such as verbs, and case particles are attached to NPs. Some researchers, such as Hosokawa (1991) and Fukuda (1993), however, follow the notion of “functional category” discussed in Fukui (1986) and Abney (1987) and regard case particles as an independent node that constitutes Kase Phrase (KP).

In this study, we will treat both grammatical and semantic case markers uniformly as a lexical category (head) that constitutes what we call **Particle Phrase (PP)** primarily because they both have overt lexical realization and determine the relation of the argument phrases to their predicates.

2.2.3 Headness

The notion of “head” plays an important role in many syntactic theories that configure, for example, “argument structure” that consists of a head and its arguments (e.g., Jackendoff, 1977), “phrase structure” that is made up of a head and its modifiers (e.g., Haegeman, 1994) and “dependency structure” that comprises a head and its dependents (e.g., Hudson, 1984). A linguistic unit at various structural levels, like a sentence, a clause, or a phrase, usually consists of a core element, referred to as “head,” and its peripheral elements.

The notion of a syntactic head is used in generative syntax (e.g., GB), for determining a parametric typology in terms of the order of the head in relation to its modifiers. This so-called head parameter classifies Japanese as a head-final language, in contrast to a head-initial language like English. Japanese generally places the head at the end of its whole unit as illustrated in (2.9) below.

- (2.9)
- a. *Taro-no*
Taro-GEN
NP (argument) + particle (**head**) = [particle phrase: PP]
 - b. *Taro-no ani*
Taro-GEN brother
PP (argument) + NP (**head**) = [noun phrase: NP]
 - c. *Taro-no ani-ga*

Taro-GEN brother-NOM
 NP (argument) + particle (**head**) = [particle phrase: PP]

- d. *Taro-no ani-ga kita*
 Taro-GEN brother-NOM come-PAST
 PP (argument) + V (**head**) = [clause]

Particles are always placed after nouns within PPs, as in (a) and (c); nominal modifiers,⁸ including adnominal PPs, precede nouns, as in (b), and verbs appear at the end of the clauses, as in (d).

2.2.4 Definiteness

The notion of definiteness is also an important property of noun phrases, which allows a contrast between an entity that is specific and identifiable (i.e., definite) and one that is not (i.e., indefinite).⁹ This contrast is generally conveyed through the use of particular language-specific descriptions.

Definite descriptions in English include noun phrases with the definite article ‘the,’ such as ‘the car,’ or with other definite determiners, such as ‘this car,’ and genitive constructions, such as ‘John’s car,’ and (personal and possessive) pronouns, such as ‘it’ and ‘his (car).’

(In)definiteness is prototypically marked by the use of definite/indefinite articles in English (and other languages that have a binary article system, such as French, Norwegian, Hungarian, and Hebrew), as contrasted in ‘the car’ and ‘a car.’¹⁰ Definite NPs in English have been extensively researched by linguists (e.g., Clark, 1977; Hawkins, 1978; Lyons, 1999) and by computational linguists (e.g., Bean and Rilloff, 1999; Vieira and Poesio, 2000a, b, c), and various classifications of their use have been proposed (see Vieira, 1998 for a comprehensive summary). Let us present here the classification made by Vieira and Poesio (2000b), as an example. The four major groups they proposed are given below with a brief definition (from pages 191-192).

- (i) **Anaphoric same head:** the description refers to an entity explicitly given in the text and by means of a same head noun.

⁸ Other types of modifiers, such as adjectives and relative clauses, always precede nouns, as well.

⁹ Prince (1992) claims that definiteness is also seen as “a conceptual property of entities in a discourse model” (page 299), suggesting that the definite/indefinite distinction is “an approximate marking of Hearer-status (Hearer-old or Hearer-new)” (page 304).

¹⁰ Some languages have only a definite article (e.g., Greek, Arabic) or just an indefinite article (e.g., Chamorro). A large group of languages lack both definite and indefinite articles (e.g., Japanese, Korean, Chinese, most Slavic languages) (Zlatic, 1997).

(ii) **Associative:** the description refers to an associated entity (trigger) that is explicitly given in the text.¹¹

(iii) **Larger situation:** the description refers to an entity or event whose existence is of common knowledge.

Unfamiliar: the interpretation of the description is based on additional information attached to the definite NP.

(iv) **Idiom:** part of idiomatic expressions.

Given these definitions and the examples in English they provide, we attempt to examine the Japanese counterparts to English definite NPs, summarized in Table 2.2 below (next page).

¹¹ The description may refer to the same entity as the antecedent or to an associated one. The antecedent may be a noun phrase (NP) as well as an even represented by a verb phrase, a sentence or even a larger sequence of text.

Classification	Japanese examples	Linguistic options in Japanese
(i) anaphoric (same head) “directly co-referring”	<i>hon – sono hon</i> ‘book – the book’	demonstrative adjective + NP
	<i>hon – hon</i> ‘book – Ø book’	bare NP
	<i>hon – sore</i> ‘book – it’	demonstrative pronoun
	<i>hon – Ø</i> ‘book – Ø’	ZERO
(ii) associative (different head / same entity) “indirectly co-referring”	<i>haadokabba – sono-hon</i> ‘hardcover – the book’	demonstrative adjective + NP
	<i>haadokabaa – hon</i> ‘hardcover – book’	bare NP
associative (different entity) “bridging”	<i>hon – sono hyosi</i> ‘book – the cover’	demonstrative adjective + NP
	<i>hon – hyosi</i> ‘book – cover’	bare NP
	<i>kaisya – Ø (syain)</i> ‘company – Ø (employee)’	ZERO
(iii) larger situation	<i>kookyo</i> ‘Imperial Palace’	bare NP
unfamiliar	<i>toosann-no uwasa</i> ‘rumor about bankruptcy’	pre-nominal phrase/clause + NP
(iv) idiom	<i>hone-o oru</i> ‘lit. break bone, take pains’	bare NP

Table 2.2: Classification of definite descriptions in Japanese

There seem to be three linguistic options in Japanese for marking definiteness. The most common lexical device for definiteness in Japanese (and in many other “article-less” languages) is the use of demonstratives that have both anaphoric and deictic functions. As is apparent, the prototypical definite descriptions in Japanese seem to be bare NPs, in addition to a total ellipsis, i.e., ZEROS. Sakahara (2000) points out that there is a strong resemblance between definite NPs in English and bare NPs in Japanese in their behaviors, especially in their referential properties.

Turning now to other more explicit types of definite descriptions, demonstrative adjectives *kono* and *ano* are approximately equivalent to definite adjectives ‘this’ and

‘that’ in English.¹² Personal pronouns, such as *kare* and *kanzyo*, are quite constrained in their usage, and ZEROS are normally used in their place; the same is true of possessive pronouns. A demonstrative pronoun *sore* is used only for non-human (either individual or event) entity.

In sum, with the exceptions of some explicit definiteness markers such as demonstrative adjectives/pronouns and pre-nominal genitive phrases, the two major marker-less constructs, i.e., ZEROS and bare NPs, linguistically realize Japanese definite descriptions. Tricky is the fact that bare NPs are also used as “indefinite” descriptions. Therefore, determining definiteness (with non-lexical means) of Japanese noun phrases is an important task in Japanese discourse processing in general (e.g., Heine, 1998; Bond, Ogura, and Kawaoka, 1995; Bond, 2001; Murata and Nagao, 1993),¹³ as well as in our computerized system, ZD. We will return to this issue later (in 2.4.1.2 and Chapter 6).

2.3 Definition of ZEROS

As we mentioned earlier in section 2.1, ellipsis is defined as unexpressed elements that are required by the grammar. Many types of ellipsis are possible across languages, such as VP-ellipsis in English (Kehler, 2002) and particle ellipsis in spoken Japanese (Maruyama, Hashimoto and Kuwahata, 1996; Fry, 2002). This paper, however, limits its scope to the omission of “arguments” in a “head-argument” construction (see 2.2.1 and 2.2.3). This includes: (i) omitted argument(s) to the head verb within a clause, and (ii) omitted argument(s) to the head noun within a noun phrase construction. In both cases, the arguments are realized as Particle Phrases (PPs). In other words, we limit the scope of arguments to obligatory elements in the form of a particle phrase (PP), excluding particle-less arguments, such as adverbial phrases and pre-copula NPs.¹⁴ Further, we limit the range of particles in PPs to grammatical case markers (see 2.2.2). The omission of heads, realized as VP-ellipsis and particle drop, is also beyond the scope of this thesis.

We will use, throughout the thesis, “zero arguments” or “ZEROS” for short, as a general term that refers to ellipsis of the two argument types that we define, and use the

¹² The distinction among three demonstrative adjectives, *kono*, *ano*, *sono*, in terms of their functions and distributions is an active area of linguistic research, but we will not go into further details here.

¹³ Their interests are in machine translation of Japanese into languages that require definite/indefinite determiners for nouns.

¹⁴ Pre-copula NPs are never elided in discourse anyway.

separate terms, “zero verbal arguments” and “zero nominal arguments,”¹⁵ when the distinction is necessary. Detailed descriptions of each type will be presented in 2.4.1.

Zero arguments represent “invisible” entities that discourse participants expect to be present for a clause or a noun phrase to make sense in a given context. Therefore, they are “definite” in nature (see 2.2.4). Native speakers find no difficulty in interpreting those ZEROS, or in comprehending a whole discourse that contains ZEROS, although they may encounter some ambiguous cases where they need to request clarification in conversation,¹⁶ or to read again for reconfirmation in reading.

Ellipsis as in this definition has been termed in various ways in the literature: simply “ellipsis” by Clancy (1980), “argument ellipsis” by Nariyama (2000), “null anaphora” by Tsujimura (1996), “empty pronoun” by Huang (1984), and “zero pronoun” by Walker, Iida and Cote (1994) among others, to name just a few. All these terms refer to virtually the same phenomenon that this thesis is concerned with, though these researchers seem to attend mostly to zero verbal arguments only. Our emphasis, however, will rather be on a less-acknowledged type, zero nominal arguments, for the rest of the thesis, particularly because this type of zero argument has not been as fully explicated as the other type in previous research, and nor has it been treated sufficiently in the centering framework, despite its significant role.

2.4 Typology of ZEROS

2.4.1 Argument types

Given our definition of ZEROS, this section provides some typological classifications of ZEROS. First, in this section, we will present the classification of ZEROS, based on their argument types. Arguments, as we discussed earlier in 2.2.1, are elements that their head predicates require. Thus, the following distinction is made according to their predicate types: verbs or nouns.

2.4.1.1 Zero verbal argument

The first type of ZERO is defined as “zero verbal arguments.” As the term implies, these ZEROS are defined as unexpressed arguments that their head verbs are required to take. They are, in other words, elements predictable from the argument structure of

¹⁵ In Yamura-Takei (2003), we call this type “zero adnominal” but it is rephrased in this thesis as “zero nominal argument” to make it parallel to “zero verbal argument.”

¹⁶ Request for clarification, such as “*dare-ga* (who does?)” or “*nan-no* (of what?),” is quite common in casual conversation among native speakers.

the verbs with which they occur. This is exemplified in (2.10) and (2.10’).

(2.10)	昨日	カレーライス	食べた。
	<i>kinoo</i>	<i>kareeraisu-o</i>	<i>tabe-ta.</i>
	yesterday	curry-and-rice-ACC	eat-PAST

The syntactic argument structure of the verb *taberu* ‘eat’ requires a nominative argument as well as an accusative argument. This implies the presence of a ZERO “Ø-(ga)” in the sentence (2.10), as indicated in (2.10’). We call this ZERO type the “zero verbal argument.”

(2.10’)	<i>kino</i>	Ø-(ga)	<i>kareeraisu-o</i>	<i>tabe-ta.</i>
	Yesterday	Ø-NOM	curry-and-rice-ACC	eat-PAST

‘Yesterday, Ø ate curry and rice.’

Zero verbal arguments can be further subdivided, according to their case roles, into several types: zero nominative, zero accusative, and zero dative. Zero nominative, for instance, is indicated as Ø-NOM in examples.

2.4.1.2 Zero nominal argument

The second type of ZERO is the “zero nominal argument,” i.e., ellipted arguments to their head nouns. Recall our earlier discussion on definiteness in 2.2.4. We stated that one class of definite descriptions in Japanese is linguistically realized by ZEROS. These ZEROS correspond to our first type of ZEROS, i.e., zero verbal arguments.

Recall also that Japanese does not exhibit an article system and, consequently, there appears to be a strong resemblance between definite NPs in English and bare NPs in Japanese in terms of their behaviors, especially in their anaphoric functions. Associative anaphora, in addition to same-head anaphora, is realized by a definite NP in English and a bare NP in Japanese, as contrasted in (2.11).

(2.11)	a.	There is a house.	The roof is red.
	b.	<i>ie-ga aru.</i>	<i>yane-wa akai.</i>

The relationship between the two entities, *ie* ‘house’ and *yane* ‘roof’ can be explained by lexical association. This is a prototypical approach to this phenomenon in the literature, which has been variously described as, inter alia, “bridging” (Clark and Haviland, 1977), “associative anaphora” (Hawkins, 1978), “inferables” (Prince, 1981), “accommodation” (Heim, 1982), “indirect anaphora” (Erk  and Gundel, 1987),

“semantic cohesion” (Fais, 2004) and “textual ellipsis” (Hahn, Strube, and Markert, 1996).

This phenomenon, on the other hand, can also be interpreted as a missing link that connects the entity *yane* to its antecedent *ie*. In other words, the entity *yane* has an implicit argument that is directly linked to an entity in the previous utterance. Notice that the second utterance, (2.11b), alone is grammatically appropriate, but semantically incomplete. The noun *yane* ‘roof’ calls readers’ attention to “of-what” information and readers recover that information in the flow of text. That missing information can usually be supplied in Japanese by an NP (i.e., ‘house,’ in this example) followed by a genitive (adnominal) particle *no*, as in (2.11’).

(2.11’) Ø-(*no*) *yane-wa* *akai*.
 Ø-(GEN) roof-TOP is-red

‘(The house’s) roof is red.’

The second entity has an unexpressed argument that in fact makes a direct reference to the entity in the previous utterance. We will take this “zero genitive” approach to treat what is elsewhere called “bridging” or the many other terms listed above.

There are several reasons for this decision. This treatment is chosen primarily because we attend to the notion of argument structure that both verbs and nouns inherently bear; the verbal and nominal arguments are realized in the form of PPs in Japanese. We have also based our decision on insights from Löbner’s (1985, 1998) discussion on functional concepts of nouns. He argues that some nouns are defined as “semantic definite” if they “represent a functional concept, independently of the particular situation referred to” (1985, page 299) and they take obligatory arguments, which are often left implicit, as in (2.12) (underlining is ours).

(2.12) Fred discussed a book in his class yesterday. He knows the author.

This is an example of “associative anaphoric use” of Hawkins (1978) and also of Vieira and Poesio (2000). We have also been inspired by Löbner’s view of this phenomenon as an “implicit argument” which is virtually equivalent to zero argument.

Secondly, the recognition of this type of ZEROS leads to a more accurate characterization of coherence in the centering framework, which will be discussed in detail in Chapter 4. Since Hahn, Markert and Strube (1996) argued that what they call “textual ellipsis” had only been given insufficient attention, as opposed to the clearer notion of direct realization, several attempts have been made to incorporate indirect anaphors into the centering framework. In order to make this attempt successful in centering work in Japanese, we assume that our “zero nominal argument” approach

works better than so-called “associative” approach for this characterization - at least for a ZERO-prone language like Japanese. In addition, zero nominal arguments have been rather neglected in the past ZERO research in general.

Lastly and most importantly, we prefer this treatment because we need to present referential links (that constitute discourse coherence) as clearly as possible for the pedagogical purposes that will later be discussed fully in Chapter 7. We assume that placing ZEROS will be more recognizable than indicating lexical associations between the two entities involved, in order to help establish coherent relations.

Actually for Japanese, some computational work has already been done on so-called indirect anaphora. Murata, Isahara and Nagao (1999) and Murata and Nagao (2000), for example, present their attempt to construct a noun case frame dictionary by using A *no* B examples, for the purpose of analyzing indirect anaphora. In a similar spirit, Kawahara, Sasano and Kurohashi (2004) view indirect anaphors as “zero anaphors of nouns” and exploit nominal case frames for the resolution of such anaphoric relations.

In addition to unexpressed nominal arguments, we include in the coverage of “zero nominal arguments” the Japanese counterparts of possessive pronouns in English, which are frequently realized by ZEROS, partly due to the constrained nature of lexical pronouns in Japanese.¹⁷ Look at the following discourse (2.13)-(2.14).

- (2.13) 花子は いつも おしゃれだ。
Hanako-wa itumo osyare-da.
 Hanako-TOP always fashionable-COP

‘Hanako is always fashionable.’

- (2.14) a. Ø 服は ブランドものばかりだ。
 (Ø-no) *huku-wa burando-mono-bakari-da.*
 (Ø-GEN) clothes-TOP brand-name-item-only-COP.

‘(Ø ‘her’) clothes are all brand-name items.’

- b. 彼女の 服は ブランドものばかりだ。
 kanojyo-no huku-wa burando-mono-bakari-da.
 her clothes-TOP brand-name-item-only-COP.

‘Her clothes are all brand-name items.’

¹⁷ Kameyama (1985) states that overt pronouns are used for contrast, emphasis, or focus (page 30).

- c. 花子の 服は ブランドものばかりだ。
Hanako-no huku-wa burando-mono-bakari-da.
 Hanako-GEN clothes-TOP brand-name-item-only-COP.

‘Hanako’s clothes are all brand-name items.’

All three variants in (2.14) that could follow the utterance (2.13) are grammatical, but are not equally natural as part of the discourse. The most natural sounding is the (2.13)-(2.14a) sequence; (b) is possible, but domain-specific and not as natural as (a), and (c) sounds rather awkward because of the redundant repetition of names. The type of ZERO represented in (a) is also included in our definition of zero nominal arguments.

In sum, we regard an unexpressed ‘NP *no*’ phrase in the NP *no* NP (a.k.a., A *no* B) construction as our second type of ZERO. Our definition of zero nominal arguments covers the two phenomena often treated distinctively in the study of English (and some European languages): possessives and (subset of) associative definite descriptions.

The relationship established by a genitive (adnominal) particle *no* that links the A noun and B noun is not limited to possession, but exhibits a wide variety of relations, as we will see later in the next section. Note, though, that however wide the variety of relations may be, this construction does not cover all the phenomena that are categorized in the literature as “associative.” We limit the coverage of zero nominal arguments to what is possible in the A *no* B construction when they are made “visible.” An antecedent-head noun pair, ‘Titanic’-‘passengers’ is one example, because Titanic-*no* passengers are semantically possible. Examples of associative relations between the two entities that are exempt from our definition of zero nominal arguments include: (i) different head-same entity association, such as ‘Titanic - passenger boat,’ (ii) knowledge-driven association, such as ‘Titanic - iceberg,’ and (iii) lexical relatedness, such as ‘boat - harbor.’

2.4.1.3 Nominal argument

This subsection presents some characteristics of nominal arguments in Japanese, in terms of both the surface (syntactic) realization and the semantic relations they bear. We will use some data both from our earlier corpus study (Yamura-Takei and Fais, ms.), which closely examined the A *no* B construction, i.e., NPs with “explicit” nominal arguments, found in a corpus of Japanese email¹⁸ and from examples found in our corpus (see Chapter 4 for a detailed description of the corpus).

¹⁸ This is the corpus whose portions were used in Fais and Yamura-Takei (2003) in which a description of the nature of the corpus can be found.

Syntax of the nominal argument

In contrast to English that exhibits several types of surface realization for nominal arguments, Japanese allows only a single construction, i.e. adnominal phrases, NPs followed by an adnominal particle *no*, as illustrated in (2.15).

- (2.15) ジョンの車
John-no kuruma
John-GEN car

‘John’s car’

Although they are basically instances of one single construction, there are two cases in which A *no* B phrases are not as simplex as the example (2.15).

One case involves the inclusion of other particles attached to an adnominal particle. This type of A *no* B phrase can arise in two ways. In example (2.16), the particle (underlined) simply adds semantic information to the phrase in a fairly transparent way.

- (2.16) 市原での ジェフ VS アントラース
itihara-de-no jehu vs antoraazu
Ichihara-in-GEN JEF vs. Antlers

‘JEF vs. Antlers match in Ichihara’

The information provided by such a particle can also be helpful in avoiding semantic ambiguity; (2.17) is an example in which *kara* ‘from’ helps identify Mr. Y as the source and not the possessor of the mail.

- (2.17) Y-部長からの メール
Y-butyo-kara-no meeru
Y-manager-from-GEN mail

‘mail from Mr. Y, the manager’

These examples comprise only a small portion, about 4% of the total number of A *no* B phrases (21 in number) in the email corpus, and involve six different particles. Our corpus contains only seven such examples (0.8%).

A second more complex example of this construction concerns multiple constituent examples (A *no* B *no* C...). There are cases in which more than two nominals are joined by *no*’s, as in (2.18).

- (2.18) a. プレーヤーの 容姿の 問題
pureiyaa-no yoosi-no mondai
 player-GEN appearance-GEN problem

‘a problem of the player’s appearance’

- b. タベの テニスの 試合
yuube-no tenisu-no siai
 last night-GEN tennis-GEN match

‘last night’s tennis match’

These phrases can be bracketed until they are reduced to combinations of phrases containing only two elements (cf. Barker and Szpakowicz, 1998), as illustrated in (2.19).

- (2.19) a. ((プレーヤーの 容姿) の 問題)
 ((player *no* appearance) *no* problem)
 ‘((the player’s appearance) problem)’
 ((A *no* B) *no* C)
- b. (タベの (テニスの 試合))
 (last night *no* (tennis *no* match))
 ‘(last night’s (tennis match))’
 (A *no* (B *no* C))

Note that these two examples of multiple constituents differ from each other in terms of the semantic dependency relations among the constituents of the phrases. Each of these subphrases is assigned an appropriate semantic labeling (see next part).

Further, these types of phrases could contain up to as many constituents as logically possible. Table 2.3 below (next page) gives the frequencies of the types of multiple constituent examples in the email corpus and in our corpus.

The simplest construction comprises the majority in both corpora, but its potential multiplicity has also proven empirically valid.

Multiplicity type	# (%)	
	Email corpus	Our corpus
<i>A no B</i>	497 (86.74%)	675 (88.75%)
<i>A no B no C</i>	68 (11.87%)	86 (11.15%)
<i>A no B no C no D</i>	5 (0.87%)	10 (1.30%)
<i>A no B no C no D no E</i>	3 (0.52%)	0 (0.00%)
Total	573 (100%)	771 (100%)

Table 2.3: Frequencies of multiple constituent *A no B* phrases in the two corpora

Semantics of the nominal argument

We have seen that virtually all nominal arguments in Japanese are realized by a single linguistic construct (with the two minor syntactic variations mentioned above), unlike those in English and some other European languages. When it comes to semantic relations, on the other hand, the relationship established by a genitive (adnominal) particle *no* that links the *A* noun and the *B* noun is not limited to possession, but exhibits a wide variety of relations. In order to examine the variety of relationships holding between the zero nominal argument noun and its head noun, i.e., (*A no*) *B*, we use an existing *A no B* classification scheme. We adopted, from among many approaches to the categorizations of *A no B* phrases, a classification proposed by Shimazu, Naito and Nomura (1985, 1986a, 1986b, and 1987, henceforth SNN) who made an extensive analysis of the possible relationships holding between the two entities, *A* and *B*.¹⁹ SNN extracted 3,810 *A no B* phrases from a corpus of ten articles from a journal, *Science*, averaging about 200 sentences and 24,750 characters per article. They classified these examples into five main groups according to the semantic dependency relations between the elements of the phrases.

It is important to note that our labeling differs from that of SNN in one significant way. The categories figuring in the labeling of SNN rely largely on semantic definitions of relationships. We opted to make our labeling syntactic as far as possible instead of strictly following SNN in this regard.

Table 2.4 (next page) describes the five main groups that we used to categorize (*A no*) *B* phrases, modeled on SNN, and the examples listed from SNN research give an indication of the wide variety of relations that are possible.

¹⁹ This is the scheme also adopted in the email corpus study in Yamura-Takei and Fais (ms.). We will present some comparative data concerning semantic relations from this corpus later in Chapter 6.

Group	Definition	Examples from Shimazu <i>et al.</i> (1986)
I	A: argument	<i>kotoba no rikai</i>
	B: nominalized verbal element	‘word- <i>no</i> -understanding’
II	A: noun denoting an entity	<i>biru no mae</i>
	B: abstract relational noun	‘building- <i>no</i> -front’
III	A: noun denoting an entity	<i>hasi no nagasa</i>
	B: abstract attribute noun	‘bridge- <i>no</i> -length’
IV	A: nominalized verbal element	<i>sanpo no hutari</i>
	B: argument	‘strolling- <i>no</i> -two people’
V	A: noun expressing attribute	<i>ningen no atama</i>
	B: noun denoting an entity	‘human- <i>no</i> -head’

Table 2.4: (A *no*) B classification scheme

In the examples in Group I, B is the nominal form of a verb and A fills some argument role (obligatory or optional) with relation to B. The reverse is true for Group IV, in which A is a nominalized verbal and B fills an argument position. When the argument is the subject, for example, then, the meaning of these expressions may be preserved in the paraphrasing “A does B” (Group I) or “B does A” (Group IV). Where the argument is the object, they may be paraphrased as “(someone/something) Bs A” (Group I) or “someone/something As B” (Group IV), and so on for other possible argument roles.

Group II and III were not possible to define strictly syntactically. While A in both Groups denotes an entity, the B nouns fall into two particular semantic categories. In Group II, B is a member of a particular class of nouns that specify relational properties. Group II B nouns are examples of what are called in the literature *keisiki-meisi* ‘formal nouns,’ *sootai-meisi* ‘relative nouns’ or *kankei meisi* ‘relational nouns’ (e.g., Inoue, 1976). In Group 3, on the other hand, B is an attribute noun, and Group III examples can be paraphrased as “A has (some quality) B.”

In both Groups, the B nouns are nouns that are generally not used alone; Group II B nouns, in fact, include some nouns that never occur alone (*ken* ‘matter,’ and *hoo* ‘direction’). While some other B nouns in both Groups II and III are morphologically independent, they are semantically insufficient by themselves, requiring arguments to complete their meaning. Thus, *omosa* ‘weight,’ or *kaori* ‘smell’ (Group III B nouns) require an argument to specify “weight of what?” or “smell of what?” These nouns are similar to relational or bivalent nouns in English such as ‘mother,’ which require the specification of an argument denoting the entity of which ‘mother’ is the mother.

In Group V, both A and B are generally concrete nouns and they can be thought of as being related by a “hidden” predicate (Torisawa, 2001a). Subdivisions made by SNN refer to particular semantic relationships holding between the two nouns. Examples comprise relationships involving humans and organizations such as “possession” and “belong-to;” they may be thought of in terms such as “A is the possessor of B,” “B is a member of A,” and so on. Other examples may be paraphrased as “B is A,” and “B is in/at/from ...A.”

This characterization of each Group plays a crucial role in the recognition of zero nominal arguments; we will discuss how we apply this to the recognition algorithm in Chapter 6.

2.4.2 Referent types

ZEROS can also be subdivided into groups according to the types of their referents, and several sets of taxonomy have been proposed. The most basic classification may be the one made by Halliday and Hasan (1976, page 33), who divide referents into two main types: “exophora” that has no mention of its referent in the text, and “endophora” that has an overt referent in the text. Endophora is further divided into two subtypes in terms of the location of the referent: “anaphora” whose referent appears in the preceding text and “cataphora” whose referent is found in the following context.

Here, we adopted the taxonomy used in Fais and Yamura-Takei (2003) which examined a Japanese email corpus. The classification used there, consisting of eight subtypes (highlighted), can be schematically incorporated into Halliday and Hasan’s hierarchy, as in Figure 2.2.

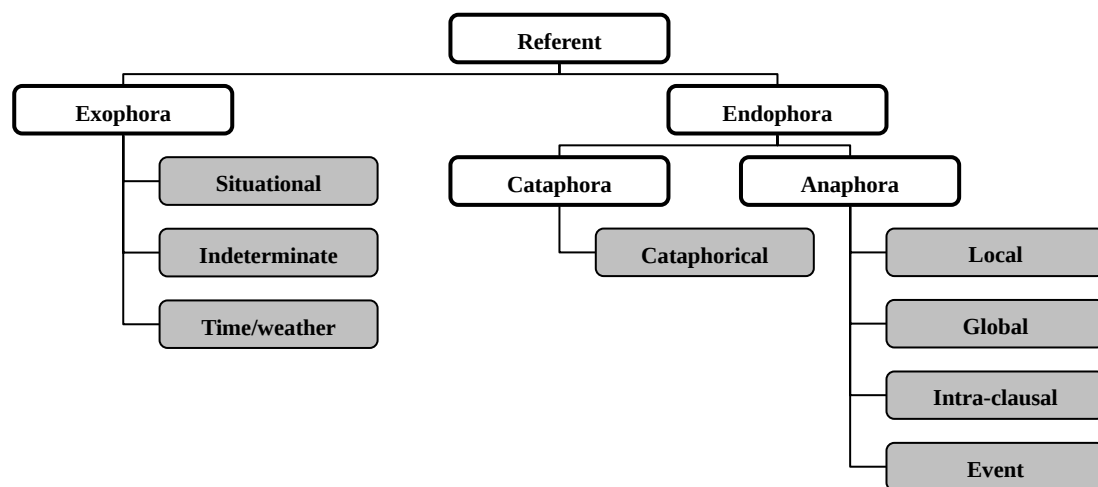


Figure 2.2: Taxonomy of ZERO referent types

In what follows, we will give a brief description of each type, along with some discussion of relevant typological work in the literature. Examples for each reference type will be presented later in Chapter 4.

2.4.2.1 Local reference

“Local reference” indicates ZEROS whose referents can be found locally, i.e., in the immediately preceding utterance.²⁰ This is the most straightforward case of reference. A number of studies indicate that the referents of ZEROS (or pronouns) tend to be found in the immediately adjacent utterance (e.g., Hobbs, 1978).²¹ When there are some competing candidates for the referent within the utterance, semantic information, such as semantic properties of the arguments and the valency requirements of the verb, usually come into play in order to allow a felicitous interpretation.

2.4.2.2 Global reference

“Global reference” is the case in which the ZERO needs to “reach” for its appropriate referent beyond the previous utterance.²² That is, none of the entities supplied in the immediately preceding utterance are correct referents, and a global search for a correct one is required. Hitzeman and Poesio (1998) reported that “long distance pronominalization” is not rare (8.4% of the total) in descriptive oral texts. Quite a few studies have also discussed this phenomenon observed for Japanese ZEROS (e.g., Takada and Doi, 1994; Okumura and Tamura, 1996; Iida, 1998; Yamura-Takei, Takata, and Aizawa, 2000).

There is no limit to how long the reach is, as long as the referent is in the text. According to the result in Fais and Yamura-Takei (2003), the distance varies from two to eleven utterances, with an average of 3.35; the majority of “global” references are to antecedents that are two or three clauses away.

2.4.2.3 Cataphorical reference

“Local” and “global” types refer to entities in the previous context. There are also references to entities in the subsequent discourse. This type of reference is called

²⁰ We combine in this category what Fais and Yamura-Takei (2003) define as ZEROS that can be resolved by “centering mechanisms” and those by “centering mechanisms supplemented with semantic information.” The referents in both types are locally available (a detailed discussion of centering is given in Chapter 3).

²¹ Hobbs (1978) found that 98% of pronoun antecedents in the English corpus examined were either in the same sentence as the one in which the pronoun is located or in the previous one.

²² Fais and Yamura-Takei (2003) term this type “long distance” reference.

“cataphorical.” Cataphora, also called backward anaphora, as a phenomenon, is observed in English, as exemplified in the utterances in (2.20) that show the cataphoric function of ‘this’ and ‘here’ respectively.

- (2.20) a. This is my suggestion. First, we should ...
 b. Here is the 7 o’clock news. Prime Minister Koizumi ...

Pronouns can also function as cataphorical referring expressions, as in (2.21).

- (2.21) When she entered the room, Jane looked ill.

Cataphora is not rare in Japanese, as well. Certain classes of demonstratives are used as cataphoric expressions, as in (2.22).

- (2.22) こんな方法が ある。 まず、...
konna hoo-hoo-ga aru. mazu, ...
 this-kind-of method-NOM be. first, ...

‘There is a method like this. First, ...’

As the example (2.22) is roughly equivalent to (2.20), there is also a construction corresponding to (2.21) found in Japanese, as in (2.23).

- (2.23) Ø 部屋に 入ると、 太郎は 踊りはじめた。
 (Ø-ga) *heya-ni hairu-to, Taro-wa odori-hazime-ta.*
 (Ø-NOM) room-in enter-and, Taro-TOP dance-begin-PAST.

‘When (he) entered the room, Taro began dancing.’

Here, a zero argument in the preceding clause makes a forward reference to a first-mentioned name in the second clause. Compare this with (2.24), in which a lexical pronoun is used instead of a ZERO.

- (2.24) 彼が 部屋に 入ると、 太郎は 踊りはじめた。
kare-ga heya-ni hairu-to, Taro-wa odoji-hazime-ta.
 he-NOM room-in enter-and, Taro-TOP dance-begin-PAST.

‘When he entered the room, Taro began dancing.’

Normally and intuitively, the overt pronoun *kare* in the first clause and the named entity

Taro cannot be interpreted as co-referential in Japanese; *kare* is likely to refer to another entity previously appearing in the context, unlike the English example in (2.21).

This subordinate-main clause construction is the prototypical environment in which cataphoric use of ZEROS appear.

2.4.2.4 Intra-clausal reference

There are ZEROS that refer to entities within the same utterance.

- (2.25) 花子が 成績を 心配している。
Hanako-ga (Ø-no) seiseki-o sinpai-site-iru.
 Hanako-NOM (Ø-GEN) grade-ACC worrying-do-PRES.

‘Hanako is worried about (her) grades.’

In this example, what Hanako is worried about is naturally interpreted as her own grades, which is realized by a zero genitive co-referring intra-clausally with the subject Hanako. This type of reference has typically been studied in the literature as “reflexives” or “reflexive pronouns.” A ZERO in (2.25) can be replaced by a reflexive pronoun *zibun* ‘self.’²³

2.4.2.5 Event reference

Pronouns in English may refer to propositions or events, and so may demonstratives, as shown in example (2.26) taken from Gundel, Hedberg, and Zacharski (2002).

- (2.26) John insulted the ambassador. It/that happened at noon.

They can make reference to non-NP constituents, such as VPs, clauses, strings of clauses, and sometimes a whole paragraph. This also applies to ZEROS or demonstrative pronouns (such as *kore*) in Japanese, as in (2.27). We call this type “event reference.”²⁴

²³ Unlike in English, however, the referent of *zibun* is restricted to animate entities.

²⁴ This phenomenon has been studied extensively under the name of “discourse deixis” (Webber, 1991), “deictic anaphora” (Eckert and Strube, 1999), and “reference to higher order entities” (Gundel, Borthen, and Fretheim, 1999), among others.

- (2.27) a. 太郎は 花子のために 送別会を 開きたかった。
Taroo-wa Hanako-no-tame-ni soobetukai-o hiraki-takkat-ta.
 Taro-TOP Hanako-for farewell party-ACC hold-want-to-PAST

‘Taro wanted to hold a farewell party for Hanako.’

- b. しかし、これは/Ø 実現しなかった。
sikasi, kore-wa/(Ø-ga) zitugen-si-nakat-ta.
 but, this-TOP/Ø-NOM realization-do-NEG-PAST

‘But this/Ø did not happen.’

A zero nominative, as well as a demonstrative pronoun *kore*, in (b) refers to the proposition described in (a).

2.4.2.6 Situational reference

Up to this point, we have been concerned with reference for “textually evoked entities” (Prince, 1981), i.e., the referents do exist in the text. However, there is also a case in which the appropriate reference is not to an entity represented in the text, but to an entity existing in the situation surrounding the discourse, the social context, or the world knowledge of the participants. Such entities are called “inferables” or “situationally-evoked” entities in the terminology of Prince (1981). The act of referring to these entities instantiates them in this set of local discourse entities (Webber, 1991). It requires an articulated model of world knowledge and of the situation of discourse to interpret them fully. We call this type of reference “situational” reference; (2.28) contains a typical example.

- (2.28) a. 太郎は タクシーから 降りるとき、
taro-wa takusii-kara oriru-toki,
 Taro-TOP taxi-out of get-out-when

‘When Taro got out of the taxi,’

- b. Ø Ø チップを 渡しわすれた。
(Ø-ga) (Ø-ga) tippu-o watasi-wasure-ta.
 (Ø-NOM) (Ø-DAT) tip-ACC give-forget-PAST

‘(He) forgot to give (the driver) tip.’

Here, a zero nominative in (b) makes a “local” reference to an entity *Taro* in (a). A zero dative in (b), on the other hand, is not likely to be co-referential with any locally found entity itself (i.e., taxi), but rather, ‘the taxi driver’ in (b) is inferred from the world knowledge. More precisely put, it is inferred from the knowledge of the relevant script, namely “a taxi script” triggered by the mention of a certain entity, i.e., taxi.²⁵ We call this type “situational reference.”

2.4.2.7 Indeterminate reference

Example (2.29) contains typical instances of ZEROS that are labeled “indeterminate reference.”

- (2.29) a. 昔は Ø よく 餅つきを したが、
mukasi-wa ($\emptyset$ -ga) *yoku motituki-o* *si-ta-ga*,
 olden times-TOP ($\emptyset$ -NOM)oftenrice-cake-making-ACC do-PAST-but

‘In olden times, (they) often used to make rice cakes, but’

- b. 最近では Ø めったに Ø みかけない。
saikin-wa ($\emptyset$ -ga) *mettani* ($\emptyset$ -o) *mikake-nai*.
 nowadays-TOP ($\emptyset$ -NOM) seldom ($\emptyset$ -ACC) see-NEG

‘these days, (you) seldom witness (it).’

Both (a) and (b) contain a zero nominative of this type; the referent for this type of ZEROS is some generalized agent, i.e., it is not a particular, previously occurring NP. The cultural knowledge about the custom of rice cake making, in the case of (a), may help narrow down the scope of agents from people in general to Japanese people (or people of a country that has the custom), but it is far from specific. This type of reference is typically translated as ‘you’ or ‘they’ in English. Gundel, Hedberg and Zacharski (2002) call this type “vague inferables,” which are “loosely referential” and refer to people in general.

These examples are similar to those cases in which the antecedent is supplied by the contextual situation (see 2.4.2.6). However, in the latter case, there is enough information to supply a particular referent, whereas in the case of indeterminate reference, the antecedent can only be identified as some general class of entities, rather than as one entity in particular.

In spite of this definitional distinction between “situational” and “indeterminate,”

²⁵ Nissim (2001) describes this type of pronouns as “roles” (page 69).

however, there seems to be a continuum from clearly referential inferables to non-referential inferables, or more precisely, from a person who can be inferred from a given situation to people in general (Gundel, Hedberg and Zacharski, 2002). Hence, it is sometimes difficult to label these two types of reference, especially when instances seem to fall in the middle of the continuum.

Note, however, that “indeterminate” reference is generally made to human entities, mostly agents, while “situational” reference is not limited to those.

2.4.2.8 Time/weather

Time and weather statements, for example, ‘It is 3:00’ or ‘It is hot,’ require a dummy or expletive ‘it’ in their subject positions in English. This non-anaphoric pronoun is often termed “pleonastic.” Its Japanese counterparts are often classified as subject-less sentences in the literature (e.g., Obana, 2000), and are differentiated from zero-subject constructions. This type of ZEROS, although they are non-referring, has been included for the sake of completeness.

- (2.30) a. Ø 春休みに なったら、
 (Ø-ga) haruyasumi-ni nat-ta-ra,
 (Ø-NOM) spring break-ALL become-PAST-when

‘When (it) gets to be the spring break,’

- b. 太郎は おばあさんのうちへ 行く。
 Taro-wa obaasan-no uti-e iku.
 Taro-TOP grandmother-GEN home-to go

‘Taro will visit his grandmother.’

No one may not wonder “what gets to be the spring break” when s/he hears the utterance (2.30a), but syntactically the verb *naru* ‘become’ requires two arguments: what becomes what.²⁶

Another instance discussed in the literature is “zero-argument predicate” such as *samui* ‘cold’ and *atui* ‘hot’ that expresses ambient conditions (Shibatani, 1990, page 361).

²⁶ According to Ishiwata (1983) and *Goi-Taikei*, the valency for the verb *naru* is defined as [N-ga N-ni/-to]. As for adjectives such as *atui* ‘hot’ and *samui* ‘cold,’ Shibatani (1990) classifies them as “zero-argument predicates” (page 361), although *Goi-Taikei* defines their valency as [N-ga].

2.4.3 Summary

We have seen two kinds of typological classifications of ZEROS, depending on their argument (case) types and referent types, which are summarized in Table 2.5 below.

Argument (case) type		Referent type		
Zero verbal argument	Nominative	Local	Anaphora	Endophora
	Accusative	Global		
		Intra-clausal		
	Dative	Event	Cataphora	
		Cataphorical		
Zero nominal argument	Genitive	Situational		Exophora
		Indeterminate		
		Time/weather		

Table 2.5: Typological classification of ZEROS

For instance, one ZERO could be in the “nominative case” of a “verbal argument type” which makes a “situational” reference, while another is a “zero nominal argument” whose referent is “locally” found. Typologically, 32 combinations (out of 4 case types and 8 referent types) are possible, but some combinations are extremely rare or non-existent, as we will see in the corpus analysis presented in Chapter 4.

2.5 ZEROS as cohesion markers

2.5.1 Cohesion types

Cohesion is a linguistically realized device that creates textual unity, i.e., coherence. Coherence represents the natural, reasonable connections among sentences that make for easy understanding. Therefore, good readers take advantage of cohesive devices that writers employ for the text to be coherent. Deficiencies in cohesion recognition/interpretation may cause readers to miss/misinterpret important cohesive links and, consequently, to have difficulties in their comprehension process.

Halliday and Hasan (1987) classified five types of cohesive relations, based on English data: (i) reference, (ii) substitution, (iii) ellipsis, (iv) conjunction, and (v) lexical relation. These grammatical and lexical devices create cohesion between clauses or sentences.

2.5.2 Cohesion in Japanese

Halliday and Hasan's typology is a useful guideline, but it cannot be directly applied to Japanese. Iijima (1983) examined cohesion types and their frequency, based on Halliday and Hasan's classification, in his Japanese data (from a JSL textbook) and found difficulties in labeling cohesion types in Japanese on a one-to-one basis.

In Japanese, reference is made by means of names (e.g., *Tanaka-san*, 'Mr. Tanaka'), repeated nouns (e.g., *inu* 'dog'), demonstrative nouns (e.g., *sono otoko*, 'the man'), demonstrative adjectives (e.g., *kore*, 'this'), quantifiers (e.g., *hutari*, 'the two people'), lexical pronouns (e.g., *kanozyo*, 'she'),²⁷ and ZEROS. ZEROS are a major realization of "reference" in Japanese that takes the form of "ellipsis." Clancy (1980) reports in her comparative analysis of English and Japanese narratives that 73.2% of the reference found in the Japanese data that she examined is made by ellipsis (i.e., ZEROS) and 26.8% by noun phrases. This is contrasted with the English counterparts: 15.7% noun phrases, 63.8% pronouns, and 20.5% ellipsis.²⁸ This suggests that in Japanese ZEROS play a distributionally similar role to overt pronouns in English. For this reason, ZEROS are often called, in the literature, "zero pronouns."

Our focus will be on the cohesion made by "reference" in the form of "ellipsis."

2.6 ZEROS for Japanese language learners

As we mentioned earlier (in 2.2.2), English and Japanese clearly contrast in "definiteness" marking. In general, English requires explicitness in its elements; the sentence becomes ungrammatical otherwise. Japanese, in contrast, allows a high degree of implicitness, of which ZEROS are a prime example.

This striking contrast poses a major challenge not only for Japanese-English Machine Translation (MT) developers (e.g., Nakaiwa and Ikehara, 1992) but also for JSL learners who have English or another explicit-argument language as their first language.²⁹ Very few JSL textbooks, however, have a section addressing formal instruction and/or include intensive exercises on this ellipsis mechanism. Yet, ZEROS do exist in very beginning level materials, as shown later in Chapter 4, not to mention in real-world authentic texts. As a result, many JSL teachers rely heavily on their

²⁷ The use of (3rd person) lexical pronouns is very constrained and domain-specific. See Hinds (1978) for further discussion of overt pronouns in Japanese.

²⁸ Clancy observes that ellipsis in English is limited to preserved subject position, as in "the boy picks up the rock and (he) throws it out of the road."

²⁹ Nakahama (2003) examines how "language distance" plays a role in the L2 learning processes, with a focus on referential topic management.

intuition about naturalness, rather than depending upon systematic knowledge, when they explain ZEROS.³⁰ Intuition is a conventional tool in teaching one's native language, but from a students' perspective, well-developed, systematic, theory-based instruction can be more convincing and more helpful. This pedagogical discrepancy is the motive for analyzing the behaviors of ZEROS within a well-developed theoretical framework (in Chapter 4), and further, for building a system that is designed for enhancing instruction and acquisition of ZEROS, from which both teachers and students can benefit (in Chapter 6). In what follows, we will present some empirical data from a JSL classroom to verify the claim that ZEROS are one of the critical issues that students face when learning Japanese.

2.6.1 Interpreting ZEROS

Both teachers and learners claim that interpreting ellipsis is not an easy task. In order to verify this claim, we assessed ten upper-intermediate JSL students' understanding of ZEROS in a text. The text contained eight ZEROS. The students, who are all native speakers of English, were requested to translate the text into English, specifying what each pronoun indicates. This was done after all the lexical information was provided. Part of the passage used for this experiment is presented below in (2.31).

- (2.31) a. 4月は 入社の日 である。
 4-gatu-wa nyuusy-a-no tuki dearu.
 April-TOP joining-companies-GEN month be.
 ‘April is the month for joining companies.’
- b. Ø たくさんの新入社員が生まれるとき である。
 (Ø-ga) takusan-no sinnyusyain-ga umareru toki dearu.
 (Ø-NOM) many-GEN new employees-NOM come-into-being time is.
 ‘April is a time when there are many new employees.’
- c. この人たちが よい社員に なるように、
 kono-hitotati-ga yoi syain-ni naru yooni,
 these-people-NOM good employees-DAT become in-order-that
 ‘In order that these people become good employees,’

³⁰ Nariyama (2000) presents a similar view (page 3).

- d. 会社は 教育を はじめる。
kaisya-wa kyooiku-o hazimeru.
 company-TOP training-ACC start

‘companies start training.’

- e. 教育の方法は いろいろ である。
kyooiku-no hoohoo-wa iroiro dearu.
 training-GEN method-TOP various COP

‘Training methods are various.’

- f. Ø 会社によって ちがう。
 (Ø-ga) *kaisya-ni yotte tigau.*
 (Ø-NOM) company-according-to different

‘(They ‘methods’) are different according to company.’

- g. Ø 有名な人に 講演を たのむ。
 (Ø-ga) *yuumeina hito-ni kooen-o tanomu.*
 (Ø-NOM) famous person-DAT lecture-ACC request

‘Companies request a lecture from a famous person.’

- h. Ø Ø ことばづかいを 教える。
 (Ø-ga) (Ø-ni) *kodobazukai-o osieru.*
 (Ø-NOM) (Ø-DAT) use-of-polite-language-OBJ teach

‘Companies teach use of polite-language.’

- i. Ø 団体生活に なれるため、
 (Ø-ga) *dantai-seikatu-ni nareru tame,*
 (Ø-NOM) working-in-a-group-OBJ adjust in-order-that

‘In order that employees adjust to working in a group,’

- j. Ø 合宿を する。
 (Ø-ga) *gassyuku-o suru.*
 (Ø-NOM) camp-ACC do

‘(They ‘employees) go to a camp.’

[*Gendai*]

The deleted subjects in the utterances (f) through (j) switch from one entity to another (‘methods,’ ‘companies’ and ‘employee’). This seems to make the students more puzzled than in the straightforward case of the ZERO in utterance (b).

The results of this experiment had some interesting implications. Firstly, out of a total of 80 ZERO interpretations, only 46% of them turned out to be correct.³¹ Some ZEROS were easier to resolve than others; success rates ranged from 10% to 90%. The ZERO in (g) is the hardest, while the one in (b) seems quite easy. Also, some students performed better than others; scores varied from 0% to 80%. Interestingly, the students’ scores roughly agree with their overall proficiency in Japanese.

Overall, the result, despite these variants, was poor enough to demonstrate the validity of the claim that ZEROS are hard to process for human L2 learners. Also, it implied that there is variation among types of ZEROS and among learners in terms of difficulty of interpretation.

2.6.2 Producing ZEROS

For those whose first language does not permit sentence parts to be omitted, it would be a perplexing task to identify what contexts allow omission and which elements can be safely omitted. We might naturally assume that learners tend to underuse ZEROS rather than overuse them, by using the strategy of avoidance.³² This often results in unnaturalness caused by the redundant use of full noun phrases (NPs). In order to examine this assumption, let us present an intermediate student’s writing sample in (2.32).

- (2.32) a. 農民が いつも とうぞくに 米やお金を 盗まれて
 nomin-ga itumo tozoku-ni kome-ya okane-o nusum-are-te
 farmer-NOM often thief-by rice-and-money-ACC rob-PASS-and

‘The farmers were often robbed of rice and money by thieves, and’

³¹ Incorrect interpretations include the cases in which *zeros* are not clearly specified, or students probably avoided (consciously or subconsciously) stipulating them, by using passives or generic pronouns, even though they were asked not to do so. Interestingly, these are the strategies employed by many MT systems.

³² Polio (1995) shows, as a result of her analysis of anaphor choice in Chinese, that second language learners do not use zero pronouns as frequently as native speakers and that their use increases as proficiency rises.

- b. 農民が とうぞくを たおすために
nomin-ga toozoku-o taosu tame ni
 farmer-NOM thief-ACC beat in-order-that

‘in order that the farmers beat the thieves,’

- c. Ø 七人の侍を やといました。
(Ø-ga) 7-nin-no samurai-o yatoi-masi-ta.
(Ø-NOM) 7 samurai-ACC hire-POL-PAST

(They ‘farmers’) hired 7 samurais”

Japanese language teachers would recommend deleting the subject in the second utterance (*nomin* ‘the farmers’) for more natural Japanese discourse. As instantiated by this example (as well as other examples found in our data), such omissions are often advised in order to avoid unnaturalness caused by redundancy.

Japanese is known as an elliptic language. Learners understand that Japanese quite freely permits sentence parts to be omitted, but what triggers such ellipsis is not as easily understood. This potentially creates overuse of ZEROS. Let us look at the next sample written by a lower-intermediate student in (2.33).

- (2.33) a. むかしむかし ある村に ある子どもが いた。
mukasi-mukasi aru mura-ni aru kodomo-ga i-ta.
 once-upon-a-time a village-in a child-SUB be-PAST

‘Once upon a time, there was a child in a village.’

- b. Ø おおかみが来たと さけんだ。
(Ø-ga) ookami-ga ki-ta-to saken-da
(Ø-NOM) wolf-NOM come-PAST-COMP shout-PAST

‘(He ‘child’) shouted that a wolf came.’

- c. 村人が 来たが、
murabito-ga ki-ta ga,
 villager-NOM came but

‘The villagers came, but

- d. おおかみは なかった。
 ookami-wa *nakat-ta.*
 wolf-TOP be not-PAST

‘there was no wolf.’

- e. Ø なんども Ø くりかえして、
 (*Ø-ga*) *nandomo* (*Ø-o*) *kurikaesi-te,*
 (*Ø-NOM*) many times (*Ø-ACC*) repeat-and,

‘(He ‘child?’) repeated (it ‘shouting?’) many times, and’

- f. 村人が おこった。
 murabito-ga *okot-ta.*
 villager-NOM get-angry-PAST

‘the villagers got angry.’

- g. Ø 来なくなった。
 (*Ø-ga*) *ko-naku-nat-ta.*
 (*Ø-NOM*) come-NEG-become-PAST

(They ‘?’) did not come any more. ”

The three ZEROS in (e) and (g) are very ambiguous. It is not clear who repeated what many times, and who did not come any more. In this example, teachers would advise not to use ZEROS in order to avoid potential ambiguity.³³

The use of ZEROS is a double-edged sword precariously balanced on a thin line. Underuse of ZEROS causes redundancy while overuse of ZEROS causes ambiguity. However fine the line may be, there needs to be some theoretical guidelines about where to draw it. We conjecture that Centering Theory (that we overview in Chapter 3) will provide such a base.

³³ In this particular example, lack of other strategic skills (e.g., viewpoint fixation) to enables ZERO use more safely appears to affect the naturalness of this discourse.

2.7 Summary

In this chapter, we first introduced the definition and typology of ZEROS after discussing some key concepts related to the nature of ZEROS. We presented two argument types and eight referent types of ZEROS. We also described the status of ZEROS as cohesion markers in Japanese and presented some empirical evidence, from a classroom, for problems that JSL learners encounter in their interpretation and production of ZEROS.

Discussion in this chapter will serve as a base of the subsequent chapters. Diverse nature of ZEROS will be empirically verified in the corpus analysis presented in Chapter 4. The role of ZEROS as cohesion markers will be more fully explicated in the centering framework, in Chapter 3, and then given evidence from the corpus in Chapter 4. Solutions to potential problems with ZEROS for JSL learners will be technologically proposed in Chapter 6 and pedagogically discussed in Chapter 7.