TWO ASPECTS OF JAPANESE CASE
IN ACQUISITION

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ABSTRACT

Two aspects of Japanese case are investigated in first language acquisition: morphological case-marking and case particle deletion. Experimental research is focused on children's use of nominative and accusative case particles and their omissibility as manifested in a subject-object asymmetry.

The central questions for morphological case-marking involve what types of errors children make and what causes the errors. Case-marking particles for intransitive verbs, transitive verbs, and dyadic stative verbals are examined. The results showed that the predominant errors were overextension of the nominative case particle to the direct object of transitive verbs. The effects of verb semantics and argument animacy were found to be significant. I suggest that the children's case-marking errors are rooted in multiple factors, and discuss various hypotheses to account for each factor.

Case particle deletion is typically manifested in a subject-object asymmetry. In hierarchical syntactic representations, case particles for arguments in the direct object position may be deleted while those for arguments in the subject position may not. This syntactic constraint was investigated in children's language in the same experiments that examined morphological case-marking. The results revealed that the children basically followed the syntactic constraint: accusative お was more likely to be deleted than nominative が for transitive verbs. Moreover, they demonstrated that their knowledge referred to syntactic positions in hierarchical structures, because the subject-object
asymmetry was also observed for dyadic stative verbals, where both subjects and direct objects are marked with the nominative case particle.

One of the most striking results in the comparison of the two aspects is the age factor. For case particle deletion, even 3-year old children tended to follow the syntactic constraint, whereas for morphological case-marking the older preschool children made a number of errors. The seemingly more abstract aspect of the omissibility of case particles is basically error-free, whereas the more concrete morphological phenomenon of case-marking appears to be more difficult and takes more time to learn. These two aspects seem to spring from different grounds and follow different paths in the child's grammar, which suggests that the learning processes involved for each aspect may be quite different.
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CHAPTER 1

INTRODUCTION

The research project that I will present in this dissertation involves an investigation of the acquisition of Japanese case. I focus on two morphosyntactic phenomena of Japanese case: morphological case-marking and case particle deletion.

In Japanese, case is usually morphologically manifested in case particles as in the following sentence.

(1) Dare-ga nani-o tabeta no?
    who-Nom what-Acc ate  Q
    'Who ate what?'

Above, for the transitive verb *tabeta* 'ate', the nominative case particle *ga* and the accusative case particle *o* are used to mark the subject and the direct object, respectively. However, case particles are not always used. One such context is shown in (2), where the accusative case particle is simply dropped from the direct object.

(2) Dare-ga nani-∅ tabeta no?
    who-Nom what-∅ ate Q
    'Who ate what?'

This phenomenon is typically called case particle deletion or case particle drop. Case particle deletion is frequently observed in colloquial speech, and it is syntactically constrained, as I will show in the next chapter.

Children learning Japanese must acquire the two aspects of case. When they produce a sentence, they first need to decide whether they will use case particles for argument NPs. Then, if they decide to use a case particle, they need to know what case
particle they should use. By using experimental techniques in conjunction with cross-sectional research, I examine children's knowledge of these two aspects of case at various points of developmental time.

I will first present the adult native speakers' knowledge of Japanese case as the target grammar in chapter 2. This is because we need to know what the adult native speakers' knowledge is in order to investigate how the children's knowledge develops and/or how it is different from the adult's knowledge. I assume that the target grammar involves symbolic representations and abstract linguistic rules, and that knowledge of these representations and rules enables us to produce and understand sentences productively and to differentiate grammatical sentences from ungrammatical ones.

A total of four experiments are reported in chapter 3 and chapter 4. The first three investigate both morphological case-marking and case particle deletion in children's production for intransitive, transitive and dyadic stative verbals.

For case particle deletion, I take a hypothesis testing approach. Two versions, (3) and (4), of a case particle deletion rule explained in chapter 2 are compared and tested.

(3) Nominative-accusative asymmetry: The accusative case particle may be deleted, whereas the nominative case particle may not.

(4) Subject-object asymmetry: A case particle on a direct object NP may be deleted, while that on a subject NP may not.

Although there are some previous studies on this issue, most of them are concerned only with case for transitive verbs which take nominative subjects and accusative objects. In my view, however, data involving two types of intransitive verbs—unergative and
unaccusative—and dyadic stative verbals are essential to test the hypotheses. Case particle
deletion for these verbs are also tested in the experiments.

My research on morphological case-marking is focused on children's production of
the nominative case particle *ga* and the accusative case particle *o*. To my knowledge, there
has been no quantitative cross-sectional study of this issue, although some longitudinal
studies anecdotally report children's misuse of case particles. Thus, the primary goals of
my experiments are to find whether children correctly use case particles or make errors,
and what type(s) of errors they make if their performance is not compatible with the target
grammar. I will suggest some plausible causes for their errors and formulate hypotheses to
account for the children's performance, some of which will further be tested or discussed,
others of which will be left for future research.

The last experiment, reported in chapter 4, also investigates morphological case-
marking, but from a different perspective. The aspect of children's ability examined here
involves what may be called morphological bootstrapping, by which they may infer verb
meanings from morphological case-marking patterns.

Chapter 5 is on learning and input. Based on the data obtained from the
experiments, I will discuss what learning mechanisms may be involved for the acquisition
of the two aspects of Japanese case. I will also discuss a role for parental input by looking
at actual data from the existing literature.

In chapter 6 a brief summary of my findings is presented followed by suggestions
for future research.
CHAPTER 2
THE TARGET GRAMMAR

This chapter consists of four sections. The first three sections are devoted to a presentation of the target grammar that is to be acquired by Japanese-speaking children. I focus on two morphosyntactic phenomena involving case for subjects and direct objects: morphological case-marking and case particle deletion. I will describe and explain these two phenomena in detail, and I will assume that the relevant rules and constraints are part of the target grammar which all adult native speakers of Japanese employ. The target grammar is therefore the adult-state knowledge of Japanese.

Children's linguistic performance must be evaluated in terms of the target grammar. In the last section, I will review previous acquisition studies of Japanese case. In this process we may find developmental facts which may be informative about how language learning takes place. Regrettably, however, there are not many well-designed studies based on quantitative data. This fact motivates the subsequent chapters in which I will experimentally investigate children's linguistic knowledge.

2.1 Morphological case-marking and grammatical relations

In my view, Japanese is characterized by three important linguistic devices at the sentence formation level. They are ellipsis, free word-order, and morphological case-marking. First, Japanese allows ellipsis: omission of words and phrases from a sentence. This may happen most freely in so far as the missing information is recoverable from the
discourse context. For example, in the following either the subject or the direct object, or even both of them may be dropped from the sentence if the information of the unexpressed entity is somehow shared by the participants in the discourse.

(1) John-ga hon-o yomu.
    John-Nom book-Acc read
    'John reads books.'

Second, Japanese allows relatively free word-order. In the above example, the subject is followed by the direct object constituting a basic word-order SOV. But, as shown in (2), this word-order may be changed into OSV without changing the basic meaning of the sentence.

(2) Hon-o John-ga yomu.
    book-Acc John-Nom read
    'John reads books.'

This word-order variation is possible thanks to the third characteristic; namely, morphological case-marking by postpositional case particles which indicate the grammatical relations of arguments.

Case is a system of inflection that provides syntactic information about argument NPs. Case refers to conventional case names such as nominative, accusative, and so on. Japanese case is usually marked by case particles. In the above examples, the verb *yomu* 'read' requires two arguments, one manifested as a subject and the other as a direct object; they are marked with the nominative case particle *ga* and the accusative case particle *o*, respectively. The lexical entries of verbs (or predicates) contain information about their arguments: not only the number (valency) and types (thematic roles) of arguments, but also how they are case-marked. A hierarchical representation of the sentence in (1) is
shown in (3), where the direct object hon-o 'book' is the sister of V and the subject John-ga 'John' is outside of the VP.

(3) 

Since grammatical relations are usually identified by case, one function of case may be said to be the indication of grammatical relations of argument NPs. However, case must be identified independently of grammatical relations in Japanese. This is because there is not a one-to-one correspondence between case and grammatical relations.

Consider the following three case particles which mark subject, direct object, and indirect object.

(4) ga: nominative – subject
    o: accusative – direct object
    ni: dative – indirect object

The nominative case marks a subject of both intransitive verbs and transitive verbs, and the accusative case marks a direct object. The main function of the dative case is to mark an indirect object. However, these relations are not necessarily true for all verbals. The irregularity is represented in (5) (e.g., Kuno, 19731; Kuroda, 1978; Shibatani, 1977, 1978; Takezawa, 1987a, 1987b).

1 I cite Kuno (1973) to refer to both the English and Japanese versions of his books published in 1973. For the most part each book is a translation of the other but there are some chapters included only in one of
(5) Grammatical Relations

\[
\begin{align*}
\text{subject} & \quad \text{nominative} \\
\text{direct object} & \quad \text{accusative} \\
\text{indirect object} & \quad \text{dative}
\end{align*}
\]

The above schema shows that there exists a dative subject and a nominative direct object in Japanese. And this complicates the whole picture of the case-marking system.\(^2\) The irregular case-marking patterns appear in so-called dyadic stative verbal constructions: a stative sentence in (6), a potential sentence in (7), and a desiderative sentence in (8).

(6) John-ga/-ni okane-ga iru
    John-Nom/-Dat money-Nom need
    'John needs money.'

(7) John-ga/-ni nihongo-ga hanas-eru
    John-Nom/-Dat Japanese-Nom speak-able
    'John is able to speak Japanese.'

(8) John-ga mizu-ga nomi-tai.
    John-Nom water-Nom drink-want to
    'John wants to drink water.'

Either nominative \textit{ga} or dative \textit{ni} can be used to mark subjects in (6) and (7) and nominative \textit{ga} is used to mark direct objects in all sentences above. Note that dative \textit{ni} may not be used for subject-marking in (8), simply due to its incompatibility with the desiderative -\textit{tai}. All stative verbals that allow a dative subject also allow a nominative subject but the reverse pattern is not necessarily true.

\(^2\) A variety of syntactic tests are available to demonstrate the subject and object status of argument NPs (see, for example, Shibatani, 1977, 1978, 1986, 1990; Takezawa, 1987b).

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Based on the observation here, I adopt a widely accepted view that in a dyadic stative construction, there exists a nominative/dative subject and a nominative direct object. Thus, two morphological case-marking systems coexist in Japanese.

2.2 Case particle deletion

2.2.1 Topic particle and case

Despite the fact that case particles are the primary indicators of grammatical relations, they are often unavailable in sentences. The elimination of a case particle is typically called case particle deletion or case particle drop, by which a case particle is simply dropped from an argument NP. Case particle deletion is a matter of omissibility, an optional process involving a syntactic constraint.

In practice, case particles are rather freely dropped in colloquial speech. But this statement is valid only for certain types of discourse and speech styles. In a discoursally neutral context, a syntactic constraint emerges. For example, with no discourse context, we can observe an asymmetry in omissibility between the nominative case particle from a subject and the accusative case particle from a direct object as in the following sentences (e.g., Kuno, 1973a, pp. 223-224).

(9)  *John-ɸ tiizu-о tabeta.
    John-ɸ cheese-Acc ate
    'John ate cheese.'

---

3 For this reason, an asterisk mark on sentences involving case particle deletion refers to a sentence unacceptable in a discoursally neutral context.
(10) John-ga tiizu-ϕ tabeta.
     John-Nom cheese-ϕ ate
     'John ate cheese.'

What is dropped from the subject NP in (9) is naturally considered the nominative case particle, and the sentence sounds awkward. On the other hand, if the dropped particle is accusative as is the case in (10), the sentence remains acceptable.

However, there is a possibility that a dropped particle is not a case particle. In order to see this point, compare the following sentences.

(11) John-wa tiizu-o tabeta no?
     John-Top cheese-Acc ate Q
     'Did John eat cheese?'

(12) John-ga tiizu-wa tabeta no?
     John-Nom cheese-Top ate Q
     'Did John eat cheese?'

(13) John-ϕ tiizu-o tabeta no?
     John-ϕ cheese-Acc ate Q
     'Did John eat cheese?'

(14) John-ga tiizu-ϕ tabeta no?
     John-Nom cheese-ϕ ate Q
     'Did John eat cheese?'

The particles used in above sentences include the topic marker wa, which is attached to the topic of a sentence and does not carry information about case. The first NP in (11) and the second NP in (12) are topics. What about (13) and (14) where only one of the NPs is unmarked? There are two ways to explain them. One possibility, in parallel to (11) and (12), is that the dropped particle is the topic particle wa. Another possibility is that the dropped particles are case particles: nominative ga in (13) and accusative o in (14). If this
latter analysis is correct, no topic is involved in (13) and (14). At a descriptive level, however, there is no way to differentiate between these two possibilities.

A key to solving this problem lies in the functions of the topic marker wa, one of which is called thematic: wa marks an NP which is either generic or anaphoric (Kuno, 1973b, p. 44). For this use, interrogatives (i.e., wh-question words such as dare 'who' and nani 'what') are incompatible because they are inherently non-anaphoric. It follows, as Saito (1985) suggests, that it is possible to use a wh-argument to identify a dropped case particle since the wh-argument excludes the possibility that the deleted particle is the topic marker. Now compare the following sentences which are all intended to mean 'Who ate what?'

However, Miyagawa (1987, p. 188) suggests that a wh-argument may be used with the topic particle, which denotes a strong contrastive meaning, if following two conditions are met.

(i) The speaker and the hearer share the knowledge of the existence of an identifiable set of individuals in the immediate conversational context.

(ii) Every member of this set must be exhaustively represented in the Wh wa question.

The first condition is a discourse requirement. If it is satisfied, a sentence like (iii) may be acceptable but (iv) is not, according to (ii).

(iii) Dare-wa it-te, dare-wa ika-nakat-ta no?
who-Top go-Asp who-Top go-not-Pst Q 'Who went, and who did not?'

(iv) *Dare-wa ita no?
who-Top went Q 'Who went?'

In sum, wh-argument + wa is possible only when the sentence overtly expresses an exhaustive list of the members shared between the speaker and the hearer. Considering these conditions, I believe that a sentence involving a wh-argument marked with a topic particle is rather rare. Moreover, as Kuno (1973b)
(15) *Dare-wa nani-wa tabeta no?
     who-Top what-Top ate  Q

(16) *Dare-ϕ nani-o tabeta no?
     who-ϕ what-Acc ate  Q

(17) Dare-ga nani-ϕ tabeta no?
     who-Nom what-ϕ ate  Q

In (15) since both dare ‘who’ and nani ‘what’ are incompatible with the topic particle, the sentence is unacceptable. It follows that the unmarked wh-arguments in (16) and (17) must be the result of case particle deletion: in parallel to (11), we can supply the nominative case particle in (16) and the accusative case particle in (17). Now, the contrast between (16) and (17) emerges as an asymmetry in omissibility of case particles between nominative ga and accusative o. This may be stated as in the following.

(18) Case particle deletion: The accusative case particle may be deleted, whereas the nominative case particle may not.

2.2.2. Structural properties of case

We have observed that an asymmetry exists between nominative and accusative case particles in terms of their omissibility. At this point, an important question must be addressed as to whether the asymmetry should be described solely with reference to

suggests, when a topic marker is used for a contrastive use, the phrase is usually stressed. This in turn suggests that because an NP without a particle is unlikely to get stressed, such a phrase will not contain contrastive wa. Therefore, when a wh-argument is used without a particle, the dropped particle is most likely to be a case particle.
morphological case particles as in (18) or whether it is a more general phenomenon described in terms of grammatical relations.

A touchstone for distinguishing these two cases is the stative verbal constructions (6) – (8) where the subject is marked with either dative \textit{ni} or nominative \textit{ga} and the direct object with nominative \textit{ga}. The following sentences involve case particle deletion for argument NPs of stative verbals.

(19) \begin{verbatim}
  *Dare-\phi nani-ga iru no?
  who-\phi what-Nom need Q
  'Who needs what?'
\end{verbatim}

(20) \begin{verbatim}
  Dare-ga nani-\phi iru no?
  who-Nom what-\phi need Q
  'Who needs what?'
\end{verbatim}

In (19) either the nominative or the dative particle is dropped from the subject NP, resulting in an unacceptable sentence. On the other hand, a sentence involving the deletion of the nominative particle from the direct object is acceptable as in (20). Note that it is impossible to determine whether the dative particle \textit{ni} on a subject NP is omissible, because all sentences compatible with a dative subject are also consistent with a nominative subject. It is clear, however, that the omissibility of case particles is not restricted to the accusative case marker as is exemplified in (20), where the nominative case particle \textit{ga} is dropped when it marks a direct object. Therefore, case particle deletion may be described in terms of grammatical relations as the subject-object asymmetry shown in (21).

(21) \begin{verbatim}
  Case particle deletion (revised): A case particle on a direct object NP may be deleted, while that on a subject NP may not.
\end{verbatim}
I now turn to deletion of a case particle from an argument of an intransitive verb. By the rule stated in (21), as an intransitive verb selects only for a subject, the case particle on the subject NP must be retained. But there is a contradictory observation, suggesting that a certain class of intransitive verbs does allow case particle deletion.

It is widely accepted that there are two classes of intransitive verbs: unergative and unaccusative (e.g., Perlmutter, 1978). In general, an unergative verb selects an agent-subject and an unaccusative verb a theme-subject, and this distinction on the basis of semantic properties of verbs may also be manifested in syntax (Burzio, 1986; Perlmutter, 1978; Levin & Rappaport Hovav, 1995). Although this classification does not affect morphological case-marking in Japanese, various syntactic phenomena are sensitive to unaccusativity.\(^5\) Case particle deletion is widely regarded as one of them (Kageyama, 1993; Nishigauchi, 1992). Compare the effect of deleted case particles in the following sentences.

\[(22)\quad \text{Dare-ga/}\_\_\phi \ \text{odotta no?}\]
\[
\text{who-Nom/}\_\_\phi \ \text{danced Q}
\]
\['\text{Who danced?}''
\]

\[(23)\quad \text{Dare-ga/}\_\_\phi \ \text{koronda no?}\]
\[
\text{who-Nom/}\_\_\phi \ \text{fell over Q}
\]
\['\text{Who fell over?}''
\]

\(^5\) The following phenomena are proposed to be diagnostics for unaccusativity in Japanese, although there are some controversies: resultative constructions, indirect passives, quantifier floating, verbal compound, PRO interpretation, deverbal nominal construction, light verb construction, passivized causative (see, for example, Kageyama, 1993; Kishimoto, 1996; Miyagawa, 1989; Nishigauchi, 1992; Tsujimura, 1990).
There is general agreement that the nominative case particle in (22) must be retained for the subject of unergative *odoru* 'dance'. On the other hand, the nominative case particle in (23) may be deleted from a subject of unaccusative *korobu* 'fall over'. For these phenomena, the case particle deletion rule needs to be revised to something like (24).

(24)  Case particle deletion (revised to include intransitive verbs): The case particle on the subject NP of an unaccusative verb and that on the direct object NP may be deleted, while the case particle on the subject NP of an unergative verb and that on the subject NP of a transitive verb may not.

This revised version of the case particle deletion rule is obviously missing a generalization, in trying to capture the syntactic behavior of the two classes of intransitive verbs.

Interestingly, however, in addition to case particle deletion, the subject of an unaccusative verb exhibits object-like behavior in syntax (for an overview, see Grimshaw, 1987; Levin & Rappaport Hovav, 1995). Not only the semantic property of 'theme', but also some syntactic properties are shared by the subjects of unaccusative verbs and the direct objects of transitive verbs. These similarities may lead to the rather radical but widely accepted view that the subject of an unaccusative verb is in fact a direct object with regard to its syntactic position.⁶

---

⁶ Argument types are often distinguished depending on whether an argument NP is internal to VP (internal argument) or not (external argument) (Williams, 1981). I use the term "direct object" here to refer to internal arguments.
For example, in Government and Binding (GB) theory the syntactic position of the subject of an unaccusative verb is regarded as a sister of V in deep structure (d-s), which is identical to the direct object position as shown in (25).

(25)

```
S
  |  
/  
NP  VP
  |  
/  
NP  V
  |
  John
  koronda 'fell over'
```

In order for the single argument to become a subject in a conventional sense, it is usually assumed that the NP moves from object position to subject position, as indicated by the arrow in the above tree diagram (e.g., Miyagawa, 1989). However, in contrast to this traditional view, Kageyama (1993), Nakayama and Koizumi (1991), and Nishigauchi (1992) suggest that the subject of an unaccusative verb in Japanese remains in its original position. If this is correct, unaccusative verbs require the nominative case particle to be attached to an NP in direct object position, as in the case of dyadic stative verbals, but permit the nominative case particle to be deleted just like for direct objects.

For now, I adopt the analysis that the argument of an unaccusative verb and the direct object of a transitive verb occur in the same structural position, because this accounts for a variety of syntactic phenomena including case particle deletion (see footnote 5 and 2.3.4). Therefore, the case particle deletion rule (21), repeated here as (26), is also applicable to the argument of unaccusative verbs.
(26) Case particle deletion: A case particle on a direct object NP may be deleted, while that on a subject NP may not.

This generalization assumes that grammatical relations—subject and direct object—are represented in terms of structural positions in a hierarchical syntactic representation. Thus, the case particle deletion rule in (26) may be paraphrased as (27).

(27) Case particle deletion: Only a case particle on an argument NP that is the sister of V may be deleted.

2.3 Case particles and semantics

2.3.1 Semantic functions of ga

Kuno (1973) suggests two functions of nominative ga. One is neutral description, and the other is exhaustive listing, as exemplified in the free translations of the following sentence.

(28) John-ga kita. 
John-Nom came 'John came.' (neutral description) 
'It was John who came.' (exhaustive listing)

The exhaustive listing interpretation of sentence (28) presents a complete list of people who came. Namely, John came, and this implies that no other people in the set of people under consideration came. Kuno (1973) suggests that a nominative subject can potentially receive an ambiguous interpretation—either neutral description or exhaustive listing—when action verbs, existential verbs, and adjectives of changing states are used. In other cases, where stative verbals and adjectives and nominals of more or less permanent states are
used, only the exhaustive listing reading is available. In sum, when *ga* is used to mark the
subject of a sentence, it may be able to contribute to an exhaustive listing interpretation.

On more general grounds, Shibatani (1990) observes that the meaning difference
suggested by Kuno (1973) lies in the notions of new information and focus. According to
Shibatani (1990, p. 269-271), the following sentence involving a *ga*-marked subject may
be felicitously uttered in two contexts.

(29)  Yuki-ga   siroi.
     snow-Nom white
     'The snow is white.'

One of the contexts in which the above sentence fits is the situation where the speaker
provides new information about the state of affairs. An other situation is that (29) is the
answer to the question 'what is white?'; therefore, the answer conveys not only new
information but also focus on the entity marked with *ga*. The former usage roughly
corresponds to neutral description and the latter to exhaustive listing in Kuno's (1973)
terms.

At any rate, these semantic functions of *ga* are not usually observed with
accusative *o*. A question arises as to object-marking *ga* in stative verbal constructions:
whether it also has a function of exhaustive listing or focus. Kuno (1973b, pp. 55-56)
briefly points out that it does not have the exhaustive listing connotation by looking at
sentences like the following.

(30)  John-wa  eigo-ga    dekiru.
     John-Top English-Nom can
     'Speaking of John, he can speak English.' (neutral description)
     'Speaking of John, he can speak English (and only English).'</ (exhaustive listing)
According to Kuno, the only permissible interpretation is the neutral description shown in the first of the free translations. This may be true if we capture the function of ga precisely as exhaustive listing; however, a focus function in Shibatani’s (1990) sense seems to be still available in considering the situation in which (30) may be used as the answer to the question ‘what language can John speak?’

Interestingly, as John Haig (personal communication) suggested, there may be a contrast in focus or exhaustive listing between ga-marked object and o-marked object for stative verbals. For the objects of certain dyadic stative verbs, it is possible to use not only nominative ga but also the accusative case particle o as in the following sentence.

(31)  John-wa eigo-ga/-o dekiru.  
     John-Top English-Nom/-Acc can  
     ‘John can speak English.’

In the above sentence, eigo ‘English’ sounds more focused when it is used with ga than o. This contrast would not arise if there is no difference between the two particles. As Shibatani (1990) suggests, however, the difference may be a matter of degree: exhaustive listing or focus is stronger for ga than o.

2.3.2 Stativity

In 2.1, two morphological case-marking patterns in Japanese are explained: one for nominative-accusative case-marking in transitive structures and the other for dative-nominative or nominative-nominative (hereafter double nominative) case-marking in dyadic stative verbal constructions. Kuno (1973), Shibatani (1978, 1986), Jacobsen (1990), among others consider the semantic property of stativity in the verb lexicon to
form a natural class for the latter case-marking pattern. In the following sentences, all verbals have in common a [+stative] feature.

(32)  **Stative**
  John-ga/-ni okane-ga iru.
  John-Nom/-Dat money-Nom need
  'John needs money.'

(33)  **Potential**
  John-ga/-ni nihongo-ga hanas-eru.
  John-Nom/-Dat Japanese-Nom speak-able
  'John is able to speak Japanese.'

(34)  **Desiderative**
  John-ga mizu-ga nomi-tai.
  John-Nom water-Nom drink-want to
  'John wants to drink water.'

Kuno (1973) observes that all adjectives and nominal adjectives are inherently [+stative], while verbs that represent actions are [−stative]. Among derived verbals, potential -(r)e, -(r)are in (33) and desiderative -tai in (34) are [+stative], while causative -(s)ase and passive -(r)are are [−stative], for example. Only the verbals whose feature is [+stative] select NP arguments compatible with dative-nominative or double nominative case-marking. How is the notion of stativity related to this case-marking?

First of all, looking at the semantic properties of verbals, we see that the notion of stativity is associated with low transitivity. The following table is adapted from Hopper and Thompson (1980), who list general semantic features in terms of transitivity. They suggest that transitivity is a matter of degree on a continuum rather than a dichotomy.

Take, for example, *iru* 'need' from (32). This is non-action, atelic, and non-punctual. When
Table 2.1 Transitivity Features (from Hopper & Thompson, 1980)

<table>
<thead>
<tr>
<th>Transitivity</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>2 or more</td>
<td>1</td>
</tr>
<tr>
<td>Kinesis</td>
<td>action</td>
<td>non-action</td>
</tr>
<tr>
<td>Aspect</td>
<td>telic</td>
<td>atelic</td>
</tr>
<tr>
<td>Punctuality</td>
<td>punctual</td>
<td>non-punctual</td>
</tr>
<tr>
<td>Volitionality</td>
<td>volitional</td>
<td>non-volitional</td>
</tr>
<tr>
<td>Affirmation</td>
<td>affirmative</td>
<td>negative</td>
</tr>
<tr>
<td>Mode</td>
<td>realis</td>
<td>irrealis</td>
</tr>
<tr>
<td>Agency</td>
<td>high in potency</td>
<td>low in potency</td>
</tr>
<tr>
<td>Affectedness</td>
<td>totally affected</td>
<td>not affected</td>
</tr>
<tr>
<td>Individuation</td>
<td>highly individuated</td>
<td>non-individuated</td>
</tr>
</tbody>
</table>

the verb is used in a citation form it usually has a present tense interpretation. The verb is non-volitional, irrealis in modality, low in potency, and the object is neither highly affected nor individuated. Affirmation does not appear to be as relevant as other features for transitivity in Japanese. On the whole, however, the verb *iru* 'need' is extremely low in transitivity except in one aspect: number of participants. This observation is also applicable to other stative verbals such as those in (33) and (34). They are atypical transitive verbals except that they require two arguments manifested as subject and direct object.

It may be natural to consider that these atypical features of transitivity in Japanese stative verbals are reflected in their atypical case-marking. Jacobsen (1990, p. 87) observes

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7 In contrast, when a non-stative verb is used in the present tense, it typically receives a future interpretation.

8 See Jacobsen (1990) for details.
that a nominative-marked object of a stative predicate expresses a property residing in that entity, and this is normally expressed as a subject (marked with nominative case in Japanese) in the grammar of natural languages.9

2.3.3 Causality

There are two types of causative verbs in Japanese: one has irregular morphology and the other involves the productive suffix -(s)ase. Following Shibatani (1976), I call

__________________________
9 Interestingly, Shibatani (1986) suggests that many stative verbs have in fact dual status—both intransitive and transitive—by looking at historical development of a stative verbal construction. According to him, the historical development can even be observed synchronically: reflected in the stative construction (i) which developed from the intransitive ‘spontaneous’ construction (ii) which in turn has arisen from the 'ambient' construction (iii).

(i) Boku-ni mo kotaе-ga wakatta.
   'The answer has dawned on me, too.'

(ii) A!, kotaе-ga wakatta!
    'Now, the answer dawned (on me).'

(iii) A!, wakatta!
    'Now (I) understand!'

(iv) Yamada sensei-ni (wa) eigo-ga wakaru.
    'Professor Yamada understands English.'

While both (i) and (ii) are spontaneous expressions, (i) specifies the person to whom the spontaneous event pertains, but (ii) does not. Furthermore, he suggests that sentence (iv) is the result of reanalysis of a two-argument spontaneous sentence like (i), where the predicates describe a property of the sentence initial NP. This reanalysis leads to the shift of grammatical relations and transitivty change: "the dative NP's have assumed the subject role, with the object relation being borne by the nominative NP's, the erstwhile subjects" (p. 150).

21
them the lexical causative and the productive causative, as illustrated in (35), where verbal
morphology is represented by the smallest morphological boundary.

(35)  

<table>
<thead>
<tr>
<th>Lexical causative</th>
<th>Productive causative</th>
</tr>
</thead>
<tbody>
<tr>
<td>ak-e-ru 'open iv.'</td>
<td>aruk-ase-ru 'make someone walk'</td>
</tr>
<tr>
<td>(ak-u 'open iv.')</td>
<td>(aruk-u 'walk')</td>
</tr>
<tr>
<td>ok-os-u 'get up iv.'</td>
<td>tabe-sase-ru 'make someone eat'</td>
</tr>
<tr>
<td>(ok-i-ru 'get up iv.')</td>
<td>(tabe-ru 'eat')</td>
</tr>
</tbody>
</table>

The lexical causative is usually analyzed as a transitive verb. It usually has its own lexical
entry in a dictionary. (Morphologically similar intransitive counterparts are shown in the
parentheses.) On the other hand, the productive causative is regarded as the causativized
version of the basic form shown in the parenthesis, and it is also referred to as the
morphological causative.

Syntactic differences between the two types of causative verbs are often discussed
(e.g., Shibatani, 1976), but here I focus on their case-marking. In short, the lexical
causative is just like the non-causative transitive verbs in that they usually take a direct
object marked with the accusative case particle. The productive causative, in contrast, may
take either the accusative or the dative case particle as in the following sentences.  

(36)  

| John-ga Mary-ni/-o aruk-ase-ta. |
| John-Nom Mary-Dat/-Acc walk-Caus-Pst |
| 'John let/made Mary walk.' |

10 There seems to be no consensus on the treatment of ni in causative sentences. In the glosses for the
example sentences, I adopt "dative" for convenience. But Shibatani (1990), for instance, suggests that the
"ni seems to be either identical or akin to the ni that marks the agent of a passive clause" (p. 309).
(37) John-ga Mary-ni banana-o tabe-sase-ta.
    Jon-Nom Mary-Dat banana-Acc eat-Caus-Pst
    'John let/made Mary eat a banana.'

The productive causative applies to both intransitive verbs as in (36) and transitive verbs as in (37). For the intransitive verb in (36), the causee is marked with either ni or o. The choice of particle is related to the agentivity of the causee: ni is used for an agentive or volitional event (i.e., let Mary walk), and o is for a non-agentive coercive event (i.e., make Mary walk). For causativization of a transitive verb, on the other hand, only ni can mark the causee, as in (37)—an accusative particle is not allowed. Interestingly, the ni-marked causee in (37) is now ambiguous in terms of its agentivity: the causee is either agentive or non-agentive.

The choice of particles observed in the productive causative for intransitive verbs might be manifested as well for the lexical causative in a very special case. Compare the following sentences involving lexical causatives.

(38) John-ga doa-o/*-ni aketa.
    John-Nom door-Acc/-Dat opened
    'John opened the door.'

(39) John-ga Mary-o/*-ni okosita.
    John-Nom Mary-Acc/-Dat got up
    'John got Mary up.'

---

11 In case a causee may not be compatible with volitional/agentive acts, ni may not be used as the following sentences demonstrate.

(i) John-ga sakana-o kusar-ase-ta.
    John-Nom fish-Acc rot-Caus-Pst
    'John had the fish rotted.'

(ii) *John-ga sakana-ni kusar-ase-ta.
    John-Nom fish-Dat rot-Caus-Pst
    'John let the fish rot.'
(40) John-ga Mary-o/-ni nakaset.
    John-Nom Mary-Acc/-Dat make cry
    'John made Mary cry.'

The causee is usually incompatible with ni regardless of whether it is inanimate as in (38) or animate as in (39). However, only for some verbs, ni could mark the causee as in (40), but this requires a special context. For example, the most likely context for the ni-marked causee in (40) is that John asks Mary to cry as a director of a film. As in the case of the productive causative, the minimal requirement for ni-marking is the causee's agentivity or volitionality. This does not fully ensure its compatibility with ni however, since there are many lexical causatives that resist ni-marking the causee which could be given an agentive interpretation. Thus, ni-marked causee for lexical causatives seems to be an idiosyncratic and lexical-specific phenomenon.

I now turn to the semantic aspects of causality and how it is represented in argument structure. Non-causative (transitive) verbs can be semantically represented as 'X acts on Y', whereas causative verbs are 'X causes Y to become Z'. So, a non-causative transitive verb like tataku 'hit' expresses a single proposition, whereas causative verbs such as akeru 'open up' and okosu 'get up up' contain two propositions as shown in (41).

(41) [X causes Y] [Y opens]
    [X causes Y] [Y gets up]

In the first proposition represented by square brackets, the causer X causes (acts on) Y. Then, the Y acted upon by X changes its state, as represented in the second proposition.

As a consequence, we observe some difference in thematic roles of argument NPs between causative and non-causative verbs. The direct object of a non-causative is acted
upon by an agent, and is typically called patient or theme. Further specifications may be required to distinguish non-causative from causative verbs in terms of the effects on the patient. The patient of non-causative *tataku* 'hit' is simply acted upon, whereas that of causative *akeru* 'open', and *okosu* 'get up' involves a change of state as well as being acted upon. Therefore, Pinker (1989) suggests that the object of a non-causative is simply patient, whereas the object of a causative verb is both patient and theme.\(^{12}\) This is summarized in Table 2.2, where thematic roles of stative verbals are included for comparison.

<table>
<thead>
<tr>
<th>Verb</th>
<th>Transitive (non-stative)</th>
<th>Stative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Causative</td>
<td>Non-causative</td>
</tr>
<tr>
<td>Subject</td>
<td>agent</td>
<td>agent</td>
</tr>
<tr>
<td>Object</td>
<td>patient + theme</td>
<td>patient</td>
</tr>
</tbody>
</table>

2.3.4 Unaccusativity

As I mentioned in 2.2.2, there are two classes of intransitive verbs: unergative verbs taking an agent-subject and unaccusative verbs taking a theme-subject. This dichotomy does not affect morphological case-marking in Japanese, although it is

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\(^{12}\) Usually only one thematic role is assigned to an argument NP. But Pinker (1989) and Jackendoff (1987, 1990), for example, allow more than one thematic role assignment on an argument since they think that thematic roles are merely labels, and decomposed semantic primitives are the representations which constitute semantic/conceptual structure.
manifested in some syntactic phenomena. For example, unaccusative verbs are compatible with a resultative expression, whereas unergative verbs are not. Compare the following sentences from Tsujimura (1996).

(42) *Taro-ga kutakuta ni hasitta.
    Taro-Nom dead tired run
    'Taro ran tired.'

(43) Hune-ga suityuu hukaku sizunda.
    ship-Nom in water deep sank
    'The ship sank deep in water.'

(44) Mary-ga kami-o nagaku nobasita.
    Mary-Nom hair.Acc long lengthened
    'Mary let her hair grow long.'

The resultative attribute *kutakuta ni 'dead tired' in (42) can not describe the state of the subject, whereas *suityuu hukaku 'deep in water' in (43) describes the state of the subject as a result of the event that the verb denotes. The difference between these sentences is that the verb in (42) is unergative but that in (43) is unaccusative. Looking at a sentence containing a transitive verb as in (44), we see that a resultative attribute always refers to a state of the direct object. Thus, a direct object of a transitive verb and a subject of an unaccusative verb seem to share the same feature here.

Regarding semantic or lexical conceptual aspects of unaccusativity, Levin and Rappaport Hovav (1995) offer an intriguing proposal. They suggest that part of the unergative-unaccusative distinction lies in different lexical semantic representations. The core notion for the difference is expressed in two types of causation: internal causation and external causation. According to Levin and Rappaport Hovav (1995), a caused eventuality can be characterized as follows.
Internal causation: "... some property inherent to the argument of the verb [, which] is 'responsible' for bringing about the eventuality" (p. 91).

External causation: "... the existence of an 'external cause' with immediate control over bringing about the eventuality described by the verb ..." (p. 92).

For example, unergative okiru 'get up iv.' is an internally caused verb, because the single argument of the verb is responsible for the event of getting up. Without an external force, the animate entity denoted by the argument may bring about the event. On the other hand, unaccusative aku 'open iv.', for instance, does not have internal causation because the event of opening usually requires an external cause such as a natural force or an agent. So, aku is an externally caused verb. Notice that externally caused verbs, which roughly correspond to unaccusative verbs, have two arguments at the level of lexical semantic (or conceptual) representation (LSR) shown in (46), where only one of the two arguments is manifested in the syntax of the intransitive verb.

(46) LSR

\[
[[x \text{ DO-SOMETHING}] \text{ CAUSE } [y \text{ BECOME OPEN}]]
\]

Syntax: intransitive \( \phi \)

\( y \)-subject opens iv.

Syntax: transitive \( x \)-subject

\( y \)-object opens iv.

Interestingly, externally caused verbs in English typically have a transitive usage as well.

The verb open is both intransitive and transitive as shown in (46), where the difference lies only in the number of arguments projected into syntax.\(^\text{13}\) When two arguments are manifested in syntax, one \( x \) is a subject causer (opener) and the other \( y \) is a direct

\(^{13}\) Levin and Rappaport Hovav (1995) suggest a single lexical conceptual representation for both intransitive and transitive structures for externally caused verbs. A similar proposal is observed in Hale and Keyser (1987).
object causee (openee). On the other hand, there is only one argument (y: openee) in the intransitive unaccusative structure. This is syntactically a subject but this is the causee, which corresponds with the meaning denoted by direct objects of transitive verbs.

The object-like properties of the subject of unaccusative verbs can be accounted for if we assume that it is in a direct object position in syntax. This is indeed the explanation applied to case particle deletion in 2.2.2. Therefore, the two types of intransitive verbs have distinctive syntactic structures, even though the structural difference is not reflected in the case-marking.

**2.4 Toward the target grammar**

In this section, I will review previous acquisition studies on Japanese case, focusing on morphological case-marking and case particle deletion. Children's linguistic performance needs to be examined in light of the target grammar which I presented in the previous sections of this chapter. But, it seems difficult to formulate a clear picture of the acquisition model of Japanese case from the results of previous studies, because they were conducted for different reasons and for different purposes. Fortunately, however, the previous studies offer intriguing results and insightful observations for further steps.

**2.4.1 Morphological case-marking**

Early studies on the acquisition of Japanese case tended to focus on the emergence of morphological case. Nagano (1959) regarded the emergence of particles and the period of their increasing use as the time of their acquisition, and he observed that his daughter
acquired nominative *ga* at 2;2 and accusative *o* at between 2;3 and 2;4. Okubo (1967) compared Nagano's study with her data on her child's first use of particles, and observed that in her corpus nominative *ga* emerged at 1;9 and accusative *o* at 1;8. These early studies, however, might involve a misunderstanding of the acquisition of case if we define the acquisition in terms of proper use and appropriate deletion of case particles as explained in the previous sections of this chapter. The misunderstanding seems to be represented by Clancy's (1985) statement in reviewing an enormous number of Japanese acquisition studies up to the early 80's: "the typical [course of] acquisition is from failure to use a particle where appropriate to a gradually increasing rate of production until the child's frequency approximates adult usage" (p. 387). A fundamental problem is that the acquisition of case may not be measured by the absolute frequency of case particles. Also, failure to use a case particle in appropriate context must be defined in terms of grammar, not in terms of discourse or speech styles.

These two problems are obvious when we look at how the retention and deletion of case particles are syntactically constrained (see 2.2). Simply calculating the frequency of case particles in child speech does not say why they were retained or dropped: whether due to grammatical reasons or due to performance reasons. Importantly, the latter factors must be eliminated in order to see the child's grammar. If case particles are dropped for grammatical reasons, then we can assess the children's knowledge of case. But this is true only for case particle deletion (i.e., knowledge of the omissibility of case particles), and this must be distinguished from the acquisition of morphological case, with which most previous studies are concerned. In order to look at the acquisition of morphological case-
marking, we must see whether the usage of case particles is correct or incorrect. In other words, we must examine the children's errors on overt case-marking. It must be true that the complete lack of case particles in the child's speech suggests that the child has not acquired morphological case particles, but the emergence of case particles does not necessarily mean that the child has really acquired morphological case-marking, unless we can be sure that the child's usage of case particles is correct.

Nonetheless, there is a reason why many studies are concerned with the emergence of case particles and why they tend to regard it as the time of acquisition. That is, in longitudinal studies dealing with naturalistic data "errors are not usually reported" (Clancy, 1985, p. 387). For example, Morikawa (1989) analyzed a speech sample of a child from 1;11 to 3;3, and found that his use of case particles was almost error-free: both for nominative-accusative case-marking for transitive verbs and dative-nominative or double nominative case-marking for stative verbals. However, this does not necessarily mean that the children do not make errors, because there is a possibility that their errors might simply be hidden by the elliptical character of Japanese. The most straightforward example is, of course, case particle deletion. When case particles are dropped from arguments, we never know what case particle is assumed by the speaker. Also, topicalization and argument ellipsis might contribute to the low frequency of case-marking errors. Moreover, in the event a predicate is dropped from a sentence, there is no way to judge if the overt case-marking on arguments is correct or incorrect.
Some studies report on children's case-marking errors. Clancy (1985, p. 389) observed the substitution of nominative *ga for accusative *o in the speech sample of her subject at 2;1.

(47)  *O Mizu-ga ireta noni.
       water-Nom put in although
       'Although she put in water.'

The nominative case particle was used to indicate a direct object in (47). Errors of this type are the ones which are most frequently reported in the literature. Even for the child who made very few errors, Morikawa (1989, p. 82) observed some instances of overextension of the nominative case particle.\textsuperscript{14} Yokoyama's (1997) subject, on the other hand, made many errors on particle use while the child was between 1;11 and 3;5. Among case particle errors, 281 out of 686 were the substitution of nominative *ga for accusative *o. Although Yokoyama (1997) mentions overextension of the accusative particle, it is not clear how frequently it happened. Clancy (1985, p. 388) suggests that at an early stage of

\textsuperscript{14} Regarding the overextension of the accusative case particles, on the other hand, Morikawa (1989, p. 96) observes only one instance as in (i).

(i)  Yukikonko-o iri-masen ka?  (2;10)
     snow-Acc need-Pol-not Q
     'Do you need snow?'

She treats the above case as the overextension of accusative *o for the topic particle *wa, because this sentence, often used by a street vendor, usually involves the topic particle.
language acquisition, unsystematic errors may occur. It should be worth noting that case errors on subjects of intransitive verbs have never been reported as far as I am aware.\textsuperscript{15}

Overextension of the nominative case particle is not limited to direct objects. Ito (1990, p. 64), for example, reports the substitution of nominative \textit{ga} for \textit{ni}.

\begin{equation}
\text{Okaasan-ga moratta no.}
\text{mother-Nom received Pcl}
\text{I received it from Mother.}'
\end{equation}

Here, the child (2;5) used nominative \textit{ga} for a source object which should have been marked with dative \textit{ni}. Similar cases were observed in our pilot study (Cho, Lee, O'Grady, Song, & Suzuki, 1998) where we tested Japanese-speaking children's production of two objects in an experimental situation. Ditransitive verbs take a direct object marked with accusative \textit{o} and an indirect object marked with dative \textit{ni} in Japanese. In the elicitation task for two overt objects (with subject ellipsis), we observed that the children sometimes misused nominative \textit{ga} for both direct and indirect objects.

\textsuperscript{15} In fact, I found one candidate for the overextension of accusative for a subject of an intransitive verb.

Clancy (1985, p. 388) suggests that the child's utterance in the following interaction involves an accusative particle error.

(i) \begin{center}
Mother: Tityana hora, porusya atta deshoo.
little listen Porsche existed Cop
'Listen, there was a little Porsche, wasn't there.'
\end{center}

Child: Porusha-o.
Porsche-Acc

In replying to Mother, the child supplied a case particle on the NP but dropped a predicate. If the child intended to use the same verb that was used by the mother, an error would have been made on the subject of the intransitive verb. But there is no evidence that this is true.
One of the hypotheses formulated to account for children's case-marking errors is based on semantic factors (e.g., Clancy, 1985). As we have seen in 2.3, thematic roles of arguments are only weakly correlated with case particles. In other words, although they do not have one-to-one correspondences, there are some corresponding patterns: agent is typically marked with nominative and patient with accusative. If children use these semantic features as cues for marking case, they might use nominative for agents and accusative for patients as typical patterns. On more general grounds of semantics and world knowledge, animacy may play an important role because only an animate entity may act as agent which subsumes agentivity and volitionality.

Clancy (1985, p. 389) also suggests the possibility that the overextension of a nominative case particle may be due to the great diversity of semantic features on the argument NPs to which a nominative case attaches. Verb semantics involving causality, stativity, and unaccusativity are other semantic variables which may have consequences for children's case-marking, although there seem to be no studies of this.

16 Another aspect frequently discussed in relation to the acquisition of case particles is word-order. A hypothesis formulated along this line is that since the canonical word-order is SOV where arguments are linearly marked as nominative-accusative, children might expect the first NP to be marked with nominative and the second with accusative. There is some experimental evidence that this hypothesis is true (e.g., Hakuta, 1982; Hayashi, 1975; Suzuki, 1997); however, I do not consider the word-order variable in this project because it is relevant only for sentences containing more than one overt argument. They are quite infrequent in children's spontaneous speech and they are also extremely difficult to elicit from children, probably due to their unnaturalness.
2.4.2 Case particle deletion

Because it is hard to identify case particle deletion and why case particles are dropped in children's spontaneous speech, a promising way to investigate case particle deletion is to test children in a controlled situation. Otsu (1994) examined twenty Japanese-speaking children aged between 3;0 and 4;11 on both production and comprehension tasks. In the production task, the children were told to describe an event in a picture. But they were asked to begin with a certain word that corresponded to either an agent-subject or a patient-object of the event of the scene. The following instructions were given to the child, who was supposed to describe Mother eating watermelon.

(49) Kono e ni tuite ohanasi-si-te-kureru? Mazu, okaasan de hazime-te?
   this picture about story-tell-Asp-Req to begin mother with begin-Req
   'Tell me about this picture.' 'Can you begin with "Mother"?'

(50) Okaasan-ga meron-o tabe-te-ru.
   mother-Nom watermelon-Acc eat-Asp-Prs
   'Mother is eating a watermelon.'

With the instruction in (49), the child was expected to start with the word okaasan 'Mother' which should be used as the subject of the target sentence as in (50). For the subject case-marking of three verbs he tested, Otsu (1994) found that no child dropped a nominative case particle. For object case-marking, on the other hand, the children dropped the particle 35% of a time. When the children produced both a subject and a direct object in a sentence, they never dropped the nominative particle, while they dropped the particle on direct objects 50% of the time in SOV structures.\(^\text{17}\) If the dropped particle is a case

\(^{17}\) Otsu (1994) also tested scrambled sentences (i.e., an OSV word-order) as he is concerned with the adjacency condition for case particle deletion (see 5.2.1).
particle, at least for the three transitive verbs that Otsu tested, the children demonstrated a nominative-accusative asymmetry in case particle deletion.

For the comprehension part, Otsu tested the same children by using sentences which involved only one overt argument of a transitive verb as in (51) and (52).

(51) Dare-ga taosita no?
     who-Nom knocked down Q
     'Who knocked (X) down?'

(52) Dare-o taosita no?
     who-Acc knocked down Q
     'Who (did X) knock down?'

These sentences were asked when an experimenter demonstrated an action by using two animal toys: one as an agent and the other a patient. The results were that the children's answers were always correct for the three verbs tested in the experiment: taosu 'knock down', osu 'push', and naderu 'pat'. What is crucial in the experiment is a question like (53), where a case particle was omitted.

(53) Dare-φ taosita no?
     who-φ knocked down Q
     'Who (did X) knock down?'

If the children have knowledge of case particle deletion, they will interpret the argument NP without a case particle as the direct object of the sentence. Thus, the children's answer to (53) would be a patient entity of the scene. The results were compatible with this prediction. Except two answers of 'don't know' by 3-year-old children, the children's answers all referred to patient entities in the scenes.

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18 Verbs used in the experiment are not reported in Otsu (1994).
In 2.2.2, I explained how case particle deletion is syntactically constrained. The subject-object asymmetry says that only a case particle on an argument NP that is the sister of V may be dropped, regardless of whether it is nominative or accusative. Therefore, candidates for case particle deletion include the nominative particle marking a direct object in a stative verbal constructions, and the nominative particle marking a subject of an unaccusative verb. Miyata (1992) is concerned with these two cases, and examined longitudinal corpora of children's spontaneous speech. Unfortunately, Miyata did not consider topic particle drop (see 2.2.1) which would have contributed a large number of seeming case particle deletions. But her conclusion was striking. The children aged between 2 and 5 often dropped the nominative case particle as well as the accusative case particle. But when the nominative marker was dropped, Miyata suggests that it was used mostly for the direct object of a stative verbal or the subject of an unaccusative verb. If Miyata's method had been appropriate, the results would have been consistent with the subject-object asymmetry. Similar findings are reported by Miyamoto, Wexler, Aikawa and Miyagawa (1999). But the data they examined were from the spontaneous speech of one child (2;3 - 3;0), and the exclusion of topic particle deletion is discoursally determined.

I believe that an experimental study is ideal to investigate case particle deletion since it can distinguish case particle deletion from topic particle drop. Unfortunately, Otsu's experimental study (1994) did not take this variable into account and he tested only the nominative-accusative case-marking pattern for three transitive verbs. Experimental research is also needed on unergative and unaccusative verbs and dyadic stative verbals.
CHAPTER 3

CASE FOR INTRANSITIVE AND TRANSITIVE VERBS

This chapter reports on two experiments investigating children's knowledge of two aspects of Japanese case: case particle deletion and morphological case-marking. Japanese-speaking children were tested on intransitive verbs in Experiment 1 and on transitive verbs in Experiment 2, both of which examined the two aspects of case. In the first section, I will explain the details of the experimental approach. Both experiments adopted an elicited production task, where children were urged to produce a sentence containing either a wh-subject or a wh-object of a given verb. For now, I will focus on the nominative case on subjects and the accusative case on direct objects.

3.1 Experimental approach

The acquisition of Japanese case has been investigated by many researchers. In most previous studies, however, attention has been focused on children's spontaneous speech, which is reported rather anecdotally. Moreover, as I noted in 2.4, many previous studies considered the emergence of case particles as an indication for the acquisition of case. But as I suggested, this may not necessarily be right since some studies have in fact reported children's case-marking errors. This means that the acquisition of case may not simply be measured by the emergence of case particles, because potential errors may be masked by the frequent ellipsis of arguments and case particles in children's spontaneous speech. If so, it is likely that previous studies have overestimated children's grammar.
An experimental study is necessary to evaluate children's knowledge of case. In terms of case particle deletion, lack of case particles in children's speech does not necessarily mean that their grammar is different from the target grammar, despite a prevailing assumption that increasing use of case particles marks progress toward the adult grammar (e.g., Clancy, 1985). What has to be examined is knowledge of the omissibility of case particles. In terms of morphological case-marking, children's use of overt case-markers must be examined to see whether they make errors in their use. An adaptation of the experimental approach enables us to examine this point.

For both case particle deletion and morphological case-marking, the key pattern consists of a sentence involving a wh-subject as in (1) or a wh-object as in (2).

(1) Dare-ga tataita no?
    who-Nom hit Q
    'Who hit (X),'

(2) Nani-o tabeta no?
    what-Acc ate Q
    'What (did X) eat?'

In the sentences above, it is possible to identify a deleted case particle when it is dropped from a wh-argument. Because only case particles are compatible with wh-arguments, this excludes the possibility that a deleted particle is a topic marker (see 2.2.1). Therefore, by identifying the grammatical relation of the wh-argument, we can recover the deleted particle. By the same reasoning, it is also possible to examine case-marking errors when overt particles are used.

The two experiments I report here examine children's production of sentences containing a wh-argument as the target utterance. These sentences are short enough for
young children to produce, and they are very natural. Before getting into the details of each experiment, I would like to present the method and the procedure of the experiments in this section because they are common to both experiments (Experiment 1 and Experiment 2) reported in this chapter and Experiment 3 presented in chapter 4.

The method I adopted is so-called elicited production (see, for example, Crain & Thornton, 1998; Thornton, 1996). Production tasks are often criticized for their unnaturalness both in the sentence structures elicited from children and in the artificial experimental settings. However, it is possible to construct a natural context to overcome these problems. Adopting the methodology used in Yoshinaga (1996) for Japanese wh-question elicitation, my experiment used picture cues and a puppet named Zyazzi 'The Judge' with whom the child communicated. The child was instructed to play a game.

Let us suppose we are trying to elicit a direct object of the transitive verb osu 'push'. First, a picture depicting a pushing event (by two animates) drawn on 8 ½ x 11 inch paper was shown to the child (Figure 3.1). In order to ensure that the child understood the names of the entities in the picture, an experimenter and the child had a conversation about the entities, by asking about and/or just mentioning them. In doing so, the experimenter also gave the child the verb osu 'push' by using the sentence in (3).

\[(3) \quad \text{O} \text{sitan da ne.} \]
\[\text{pushed Cop Pcil} \]
\[\text{‘(X) pushed (Y).’} \]

Note that the experimenter never gave case-marking information to the child. Next, two pictures were shown (Figure 3.2). They were placed side by side in transparent sheets of a binder. The left picture showed two objects. (In this case, two animates.)
Figure 3.1. The first picture used for the elicitation of a *wh*-object of *osu* 'push'.

Figure 3.2. Second pictures used for the elicitation of a *wh*-object of *osu* 'push.'
The right picture showed the same event as in the first picture but the entity being elicited (i.e., the direct object in this case) was hidden with a black cover. The other entity not elicited here (i.e., the subject in this case) was the same one as in the first picture. For this picture, a cue sentence (4) was given.

(4) Nee, Yuka-tyan, hora osita yo.
    'Hey, Yuka, look, (X) pushed (Y)'

At this moment, the child was told that the covered entity was one of the two objects in the left picture. Then, a third party, a puppet named Zyazzi 'Judge' was introduced and the experimenter told the child that he was the one who knew what the hidden object was by saying (5).

(5) Kore mie-nai deshoo. Demo ne, Zyazzi-wa wakaru-n dat-te sa.
    Dakara, Zyazzi-ni kiite-mite.
    'We can't see this.' 'But the Judge knows.' 'So, ask the Judge (who).'

The child was supposed to ask an object question (6) in this interaction. When the target entity was the subject of the sentence, a subject question (7) was expected.

(6) Dare-o osita no?
    who-Acc pushed Q
    'Who did (X) push?'

(7) Dare-ga osita no?
    who-Nom pushed Q
    'Who pushed (X)?'

(8) Dare?
    who
    'Who (is it)?'

Note that because the ellipsis of the subject in (6) and of the direct object in (7) are natural in this given context, the child's question typically contained only one overt argument,
even though the verb was transitive. The child sometimes produced a non-target sentence like (8). This response is considered to involve the ellipsis of copula and would still be natural in Japanese. However, for the purpose of eliciting the target structure, when the child produced (8), the experimenter went back to (4) to encourage the child to use the verb.

The game continued in order to motivate the child. After the child asked a *wh*-question, the Judge gave him/her a hint. For example, the Judge said, 'It is the one with black rings around his eyes' for a hidden panda. Then, the child gave him the answer, which was almost always correct. Finally, another picture was shown to the child (Figure 3.3), where the hidden entity was now uncovered and the child confirmed that his/her answer was correct.

![Figure 3.3. The third picture showing the answer of the *wh*-object of *osu* 'push'.](image)

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I believe that the advantages of this elicited production task are threefold. First, the sentences and instructions given to the child are natural. In experiments on Japanese, instructions and target test sentences tend to be unnatural mostly due to pragmatically unmotivated overt arguments. (This makes the sentences longer, too.) The current experiment not only overcomes this, but also makes use of the elliptical feature of Japanese to elicit \( wh \)-questions from children for the missing information. Second, the target sentence is very short. This reduces the child's burden of processing constraints which are inherent aspects of a production task (as compared with a comprehension task). Third, the game situation highly motivates children. The child subjects are likely to lose concentration and they tend to be insecure if they know that they are being tested. The current task, on the other hand, never creates an uncomfortable atmosphere because the child is playing a game. Since the child's focus is on the answering part with a given hint, the child never recognizes that he/she is being tested for \( wh \)-questions. Instead, he/she feels achievement at the end of each try.

With this method, Experiments 1 – 3 were conducted to assess children's knowledge of Japanese case. In a single experiment, both case particle deletion and morphological case-marking were tested. In doing so, I adopted a multiple factor design, where the effects of more than one independent variable are tested. This is mainly needed for morphological case-marking, because a variety of plausible factors have been reported for this phenomenon. However, since I tested both phenomena in a single experiment, I kept the experimental design where the same independent variables were tested for both aspects of Japanese case.
I will analyze the data obtained both qualitatively and quantitatively. The qualitative analysis here means to explore what types of errors children make and for what reason(s) they make such errors. The quantitative analysis refers to frequency and proportion. First, I will examine the frequency/proportion of deleted case particles. Then, the frequency/proportion of errors will be calculated. For morphological case-marking, I will focus on errors of overt case particle use.

Both descriptive statistics and inferential statistics will be performed when appropriate and necessary. Inferential statistics will be applied twice: one for case particle deletion and the other for morphological case-marking.

3.2 Experiment 1: Intransitive verbs

An unergative-unaccusative dichotomy predicts certain outcomes for children's case particle deletion. In 2.2.2, we looked at the proposal that the subject-object asymmetry in case particle deletion may also be extended to these two types of intransitive verbs: a case particle on the argument NP of an unaccusative verb may be deleted, while that on the argument NP of an unergative verb may not. This is attributed to the different structural positions for subjects of the two types of intransitive verbs. Because I assume that the sister of V is the structural position which licenses case particle deletion, both direct objects of transitive verbs and arguments of unaccusative verbs should allow their case particles to be deleted regardless of whether they are nominative or accusative. On the other hand, subjects of unergative verbs are not the sister of V; therefore, they should
not allow case particle deletion. In the present study, children's knowledge of the
omissibility of case particles is experimentally tested.

Regarding morphological case-marking, errors on subjects of intransitive verbs
have not been reported in children's spontaneous speech, as far as I am aware (but see also
footnote 15 in chapter 2). This is an intriguing fact since case-marking errors are observed
for other predicate types despite their small number. But, there is also the possibility that
case-marking errors for intransitive verbs might simply be masked by the elliptical
character of Japanese. If this is correct, errors might appear when children are forced to
produce case particles in controlled settings.

There is some reason for expecting that this might happen. It is sometimes
observed that Japanese-speaking children use intransitive verbs in transitive contexts and
transitive verbs in intransitive contexts (e.g., Nomura & Shirai, 1997; Suzuki, 1998).
These transitivity errors might be related to case-marking errors as well. For example,
unaccusative verbs are often treated as dyadic at a lexical semantic level or a pre-syntactic
level, and the single argument has object-like properties (see 2.3.4). If the child
misanalyzes it as an object-like argument in syntax, it might be marked with an accusative
case particle.

In Experiment 1, both children's case particle deletion and morphological case-
marking for intransitive verbs—unergative and unaccusative—were investigated.
3.2.1 Method

Subjects

Twenty-three preschool children living in Japan participated in this experiment. Their ages ranged from 3;0 to 6;1 (mean age = 4;5). There were fifteen 3- and 4-year-olds, and eight 5- and 6-year-olds. All of them had consistent exposure to Japanese from peers at kindergarten and from family members at home.

Materials and procedure

The tested verbs are summarized in Table 3.1. They include both unergative verbs and unaccusative verbs. Unaccusative verbs are classified into five types depending on the animacy and agentivity of the subject. There were 4 tokens for each type.

Table 3.1 Tested Verbs in Experiment 1

<table>
<thead>
<tr>
<th>Verb Types</th>
<th>Verbs (4 tokens)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1: unergative agentive verbs inherently selecting animate subject</td>
<td>oyogu 'swim', hasiru 'run', odoru 'dance', tatu 'stand up'</td>
</tr>
<tr>
<td>Type 2: unaccusative non-agentive verbs inherently selecting animate subject</td>
<td>korobu 'fall over', tukareru 'get tired', hutoru 'get fat', mayou 'get lost'</td>
</tr>
<tr>
<td>Type 3: unaccusative (change of state) non-agentive verbs inherently selecting inanimate subject</td>
<td>aku 'open', kowareru 'break', kireru 'cut', wareru 'break'</td>
</tr>
<tr>
<td>Type 4: unaccusative non-agentive verbs used with animate subject that they do not inherently select</td>
<td>oiru 'fall', taoreru 'fall down', ukabu 'float', sizumu 'sink'</td>
</tr>
<tr>
<td>Type 5: unaccusative non-agentive verbs used with inanimate subject that they do not inherently select</td>
<td>same as above</td>
</tr>
</tbody>
</table>
Elicited production was used to investigate the children's knowledge of case. The target sentence was a wh-subject question (*Dare-ga V? or *Nani-ga V*?). As the detailed procedure is described in 3.1, only a sample interaction between an experimenter and a child is presented here. In the following dialogue, case for the subject of the intransitive verb *oyogu* 'swim' was tested.

**Sample interaction: for subject elicitation of the intransitive verb *oyogu* 'swim'**

1. Showing first the picture where a tiger is swimming (Figure 3.4):

   E: Kore-wa dare kana?
     'Who's this?'
   C: Inu.
     'A dog.'
   E: Soo. Oyoida-n da ne.
     'Right.' '(The dog) swam.'

2. The next two pictures were shown (Figure 3.5). Referring to the left one depicting two animals:

   E: Kore, dare kana?
     'Who's this?'
   C: Tora.
     'A tiger.'
   E: Soo ne. Zya, kore wa?
     'Right.' 'How about this?'
   C: Buta.
     'A pig.'
   E: Soo, yoku wakaru ne.
     'Right, you know well.'
Figure 3.4. The first picture used for the elicitation of a wh-subject of oyogu 'swim'.

Figure 3.5. Second pictures used for the elicitation of a wh-subject of oyogu 'swim'.
3. Referring to the right picture depicting a covered entity which is swimming:

E: A, mite, hora oyoida yo. (while pointing at the covered entity)
   'Look, (X) swam.'
E: Demo, kore mie-nai desyoo. Dakara Zyazzi ni kiite-mite.
   'But we don't see this.' 'So, can you ask the Judge (who)?'
C: Nee, Zyazzi.
   'The Judge.'
Z: Un.
   'Yes.'
C: Dare-ga oyoida no?
   'Who swam?'
Z: Eeto ne, gaoo tte naku hoo da yo.
   'Well, that's the one that roars gaoo.'
C: Tora!
   'A tiger!'

4. The next picture was shown depicting the same event with the entity now uncovered (Figure 3.6).

E: Attari! Yoku wakatta ne.
   'Correct!' 'You're so great.'
For purposes of familiarization, a brief practice session was held before the testing session. In the practice session, elicited sentences include \textit{wh}-indirect objects (\textit{doko-ni} for \textit{noboru} 'climb' and \textit{iku} 'go'), and a \textit{wh}-adjunct (\textit{doko-de} for \textit{asobu} 'play') to avoid carry-over effects. Following the practice, 20 sentences were elicited in random order. The experiment was carried out individually and usually took 10 to 15 minutes per child.

3.2.2 Overall results

All conversations were tape-recorded and children's utterances were transcribed by the experimenter. First, the children's utterances were examined as to whether they were consistent with the target sentence. The target sentence had to have the sentence structure shown in (9).

(9) \textit{Wh}-argument (+ case particle) + verb

\textit{Wh}-arguments used by the children included \textit{dotti} 'which' and \textit{dore} 'which' as well as \textit{dare} 'who' and \textit{nani} 'what'. They used only case particles to mark these \textit{wh}-arguments.\textsuperscript{1} If a sentence included a non-\textit{wh}-subject, it was counted as an instance of the target sentence only when the subject was marked with a case particle.\textsuperscript{2} There were sentences inconsistent with (9) for various reasons which are summarized in Appendix A. These utterances were excluded from further analysis. Out of 460 tokens, 386 utterances were considered target utterances. This proportion reaches \textit{83.9\%}, ranging from \textit{80.4\%} for Type 1 verbs to \textit{87.0\%} for Type 5 verbs. A one-way repeated measures ANOVA was conducted to

\textsuperscript{1} There was no instances of topic particle use for the \textit{wh}-subject of intransitive verbs.

\textsuperscript{2} This type of sentence was observed only twice: one sentence each from two children.
examine whether there was a significant difference among verb types for the children's production of the target form. But, the results show no effect of verb type, $F(4, 88) = .796$ n.s., $p = .531$. These sentences were first examined for case particle deletion: whether the *wh*-subject was marked with a case particle. Then, error types and frequencies for morphological case-marking were analyzed.

### 3.2.3 Case particle deletion

A case particle was considered to be deleted only when a *wh*-argument was used without a particle. Overall, case particle deletion was observed in 12.5% of all target utterances, and there is no effect of verb types as shown in Table 3.2. The results show that the children's case particle deletion for intransitive verbs was not frequent. They used case particles more than 85% in the experimental situation. Eleven children never dropped case particles. The results suggest that the retention/deletion of case particles does not depend on verb types. This is confirmed by the results of a one-way repeated measures ANOVA examining the effect of verb type, $F(4, 88) = .169$ n.s., $p = .954$. Importantly, therefore, no effect of unaccusativity was observed in the children's case particle deletion

<table>
<thead>
<tr>
<th>Verb types</th>
<th>Dropped case particles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>12.2%</td>
</tr>
<tr>
<td>Type 2</td>
<td>14.5%</td>
</tr>
<tr>
<td>Type 3</td>
<td>10.1%</td>
</tr>
<tr>
<td>Type 4</td>
<td>14.3%</td>
</tr>
<tr>
<td>Type 5</td>
<td>11.3%</td>
</tr>
<tr>
<td>Mean</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

Table 3.2 Proportions of Case Particle Deletion for Intransitive Verbs
because no contrast between Type 1 verbs (unergative) and others (unaccusative) was found.

The target grammar allows the deletion of a case particle from the subject of an unaccusative verb, but the children tended to retain the nominative case particle almost equally for unergative and unaccusative verbs. Surprisingly, however, even adults tend to retain the case particle for unaccusative subjects. Hirakawa (to appear), in testing second language learners of Japanese on unaccusativity, found that her native control group did not differentiate unaccusative verbs from unergative verbs on a grammaticality judgment task. Her results suggest that regardless of the verb types (unergative/unaccusative) adult native speakers of Japanese judged sentences involving case particle deletion as rather ungrammatical. These results as well as the children's performance in the present experiment conflict with the theoretical assumption.

However, let me assume here that case particle deletion is part of the target grammar--adult knowledge of case--manifested as the asymmetry in an unergative-unaccusative dichotomy. Here, I consider the possibility of an experimental artifact for both children's and adults' data. I assumed that in the procedure which I adopted the target sentence and the given context were totally natural, and that it was possible to elicit natural utterances. However, suppose temporarily that the experimental situation might have affected the subjects in such a way that they became far more conscious of producing particles, or at least paid more attention to the case particles than they normally would have. If this were true, my prediction would be that participants in this type of experiment would tend to retain any case particles. In the experiment for transitive verbs, therefore,
children would equally retain both the nominative and the accusative case particles. We will see the results of this hypothesis in Experiment 2. For now, I just would like to note that in adult judgment tasks, the accusative case particle was more likely to be dropped than the nominative case particle (Hirakawa, to appear; Kanno, 1996).

Another possible account for the children's retention of the nominative case particle is to appeal to the semantic functions of ga described in 2.3.1. The nominative case particle often denotes focus or exhaustive listing as well as neutral description (Kuno, 1973; Shibatani, 1990). Since ga has these semantic functions, it might have been retained to fulfill them in a sentence. If this is true, then children would be expected to retain the nominative case particle more often than the accusative case particle, because the latter has no such semantic function. As mentioned above, the performance of at least the adults is compatible with this prediction.

However, the asymmetry between nominative and accusative is also exactly what the syntactic constraint predicts (see 2.2.2). Because the subject is marked with the nominative and the direct object with the accusative case particles in sentences involving non-stative transitive verbs, the semantic function account and the syntactic constraint account predict the same results. How can we choose between these two accounts? The key lies in considering patterns in which both subjects and direct objects are marked with the same case particles. Dyadic stative verbal constructions offer such a context as they involve nominative subjects and nominative direct objects. If the semantic functions of ga is the reason for its high retention rate in this experiment, children should also retain ga in
stative verbal constructions regardless of the grammatical relations of the NPs to which it attaches. This hypothesis will be tested in Experiment 3 in chapter 4.

3.2.4 Morphological case-marking

Case-marking errors were assessed. The criterion for a case-marking error is the incorrect use of an overt case particle on the subject. Using a case particle other than the nominative marker ga was, therefore, considered to be an error. When a wh-argument was not marked with any particle, it was not counted as an error. Inappropriate use of wh-words such as dare 'who' for inanimate and nani 'what' for animate was not considered to be an error here.

Only three children made errors. Two of them made one error each: HK (3;4) used the accusative case particle for the Type 3 verb aku 'open', and YK (6;0) used the dative ni for the Type 5 verb taorero 'fall down'. The third child ST (3;6) used the accusative case particle fourteen times, and errors were observed for all five types of verbs. He also used the nominative case particle, but only twice: once for a Type 2 and again for a Type 3 verb.

The overall results are generally consistent with most previous studies investigating children's spontaneous speech. Namely, Japanese-speaking children do not usually make case-marking errors, and if they do, the errors are not on the subjects of intransitive verbs. In this experiment, only three children made errors and their performance does not suggest anything about the effects of unaccusativity and animacy. In fact, the unergative-unaccusative dichotomy appears to have nothing to do with children's
case-marking on the subjects of intransitive verbs, because the children were almost always correct. Also, the fact that case particle deletion was not frequent in this experimental situation does not seem to support the idea that case particle deletion might contribute to the high proportion of correct use of case particles in children's spontaneous speech.

However, do these results mean that children have knowledge of case-marking for intransitive verbs? In other words, does their almost error-free performance reflect their grammatical competence? Because there is no counter-evidence, this may be true, but a possibility that needs to be considered here regards the children's strategy for case-marking. If a certain strategy leads them to use a nominative case particle in the experiment, their almost perfect performance may not necessarily be based on grammatical knowledge.³

Let me tentatively assume a strategy like (10) in order to account for the great majority of the children's performance.

(10) Nominative strategy: Mark an overt argument in a sentence with the nominative case particle.

This case-marking strategy tells the child to use *ga* for the single overt argument of the sentence, and this leads him/her to mark case correctly in the case of an intransitive structure. If the children's knowledge of case-marking is not stable, I believe that the

³ I used the term "strategy" to refer to children's non-linguistic solutions which are not necessarily compatible with the grammar of natural language. Thus, by definition, a strategy is independent of grammar.
strategy stated in (10) is plausible. But this raises the question of why they would adopt the nominative case particle. Although I will wait until 3.3.4.1 to tackle this question, I will say here that children do not have to stick to using the nominative case. In fact, the child, ST (3;6), mentioned above, used accusative o in most cases for marking subjects.

Now, let me revise (10) and propose (11) for a children's production strategy for case-marking particles.

(11) One argument-one particle strategy: If a sentence contains one and only one overt argument, choose one particle to mark it regardless of its grammatical relation.

The case-marking strategy (11) not only explains individual children's almost consistent use of ga or o on subjects of intransitive verbs, but also makes a prediction about children's case-marking for transitive verbs. If a child has chosen the nominative case particle, then he/she should sometimes mark the direct object as well as the subject with nominative case whenever it is the only overt argument in the sentence. Namely, an overextension of the nominative case particle would be observed. If, on the other hand, a child has chosen the accusative case particle, then he/she should sometimes mark the subject as well as the direct object of a transitive verb with accusative case, whenever the sentence is produced with only one overt argument. In this case, overextension of the accusative case particle would be observed.

Caution is required here, however. Nominative overextension, even if it is observed, does not tell us whether any correct case-marking for the subjects of intransitive verbs was due to strategy (11) or the children's knowledge of case-marking (i.e.,
grammar). This is because both strategy (11) and the correct grammar lead to the same result if children adopt the nominative case for the strategy. On the other hand, if overextension of the accusative case particle is observed (as with ST), this would suggest that strategy (11) might be involved. This in turn implies the possibility that any correct nominative case-marking could also be due to the strategy. I will return to this point in 3.3.4.1 when we look at the children's case-marking in transitive sentences.

3.2.5 Summary of Experiment 1

In this section, I will summarize the main findings of Experiment 1. I will also list accounts and hypotheses that I have formulated to explain the results. Some of these hypotheses will be investigated later.

Main findings: case particle deletion

1. The children showed no contrast between unergative and unaccusative verbs for case particle deletion.

2. The children tended to retain case particles for intransitive verbs: the overall deletion rate was only 12.5%.

Hypotheses: case particle deletion

a. Experimental artifact: Both the high retention rate and lack of asymmetry are due to some unnaturalness in the experiment, which causes children to become conscious of producing case particles. (This hypothesis will be tested in Experiment 2.)

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b. Semantic functions of *ga*: The nominative case particle was retained so that its
semantic functions could be fulfilled. (This hypothesis will be tested in Experiment 3.)

**Main findings: morphological case-marking**

3. The children's performance was almost error-free on subjects of intransitive verbs.
4. There was no effect of unaccusativity.
5. There was no effect of animacy.

**Hypotheses: morphological case-marking**

c. Children have learned case-marking for the subjects of intransitive verbs.

d. Strategy account: Children have a case-marking strategy. (The following two versions
were suggested and they will be discussed in Experiment 2 and Experiment 3 as well.)
   i) Nominative strategy: Children mark an overt argument in a sentence with the
nominative case particle.
   ii) One argument-one particle strategy: If a sentence contains one and only one
overt argument, children choose one particle to mark it regardless of its grammatical
relation.

**3.3 Experiment 2: Transitive verbs**

Otsu (1994) demonstrated that Japanese-speaking children as young as three years
old know the nominative-accusative asymmetry manifested in case particle deletion.

According to Otsu, the results of his experiments suggest that children employ a
hierarchical structure where a direct object is a sister of V, a position in which case particle deletion is allowed. If Otsu's account is correct, similar results should be obtained from the present investigation of case particle deletion for four types of transitive verbs.

Verb types were selected, however, mainly to investigate morphological case-marking. Previous studies on children's spontaneous speech suggest that case-marking errors for transitive verbs are not frequent. But as we have observed in chapter 2, there are some semantic aspects of verbs and arguments that are related to morphological case-marking, and they might cause the children's case-marking errors (see 2.4.1).

Also, I suggested for Experiment 1 that an experimental setting might reveal more errors than a naturalistic setting. This was based on my prediction that frequent ellipsis of arguments and case particle deletion might have contributed to a low frequency of errors. Although this was not evidenced in Experiment 1, there remains the possibility that an experiment on transitive verbs would disclose such cases.

Using a cross-sectional design, the present experiment also examines the effect of age. Generally speaking, children's errors decrease with age. However, since case-marking errors have been observed from considerably older children as well (e.g., Clancy, 1985), the present experiment investigates the timing of acquisition as well. Adopting the same method as for Experiment 1, I will explore in children's production both case particle deletion and morphological case-marking on subjects and direct objects of transitive verbs.
3.3.1 Method

Subjects

Thirty pre-school children living in Japan were the subjects of this study. Their ages ranged from 3;1 to 6;2 (mean age = 4;10). They were divided into two age groups. The younger group consisted of seventeen children (mean age = 4;1). There were eight 3-year olds and nine 4-year olds in this group. The older group consisted of thirteen children (mean age = 5;9). There were eight 5-year olds and five 6-year olds in this group. Among them, fifteen children had been tested on intransitive verbs in Experiment 1. All children had consistent exposure to Japanese from peers at kindergarten and from family members at home.

Materials and procedure

The tested verbs are summarized in Table 3.3. There were four types of transitive verbs, all of which select a subject marked with the nominative case particle and a direct object marked with the accusative case particle. These four types of verbs varied in causality and the animacy of the arguments which they select. Both Type 1 and Type 2 verbs are causative.\(^4\)\(^5\) Type 1 verbs inherently select animate direct objects, whereas

\(^4\) The classification of Type 1 verbs—lexical causative and productive causative—may be somewhat controversial (e.g., Jacobsen, 1992; Shibatani, 1976), and nakasu ‘make someone cry’ and yorokobasu ‘please’ might be used with ni-causee in the special context where the causee may act as a volitional agent (see 2.3.3).

\(^5\) Type 2 verbs are transitive counterparts of unaccusative verbs. Unlike English, Japanese does not usually allow transitive (causative) alternation with zero-derivation. For this class of verbs, transitivity is marked
Table 3.3 Tested Verbs in Experiment 2

<table>
<thead>
<tr>
<th>Semantics</th>
<th>Animacy</th>
<th>Verbs (4 tokens)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>subject</td>
<td>object</td>
</tr>
<tr>
<td>Type 1 Causative (internally caused verbs)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 2 Causative (externally caused verbs)</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 3 Non-causative</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 4 Non-causative</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Type 2 verbs inherently select inanimate direct objects. Type 1 consists of internally caused verbs and Type 2 of externally caused verbs, according to Levin's and Rappaport Hovav's (1995) classification (see 2.3.4). Type 3 and Type 4 verbs are non-causative. Type 3 verbs may take either animate or inanimate objects, but they were used with animate direct objects in this experiment. Type 4 verbs, on the other hand, inherently select inanimate objects. All four types of verbs usually require animate agentive subjects. Types 1 and 3 are reversible verbs whereas Types 2 and 4 are not. There were 4 tokens for each type.

Elicited production was used to investigate the children's knowledge of case for the transitive verbs. Since both subjects and direct objects of the verbs were elicited from children, the same verbs were tested twice: once for a subject and once for a direct object.

with semi-productive verb morphology (see Jacobsen, 1992, pp. 258-269). Type 2 verbs in this experiment and Type 3 verbs in Experiment 1 form transitive-intransitive pairs.
The order of testing the subject and the direct object of the same verb was randomized. A total of 32 sentences were elicited from each child in random order.

There were four independent variables in the design of this experiment. They were grammatical relations with two levels (subject, direct object), verb semantics with two levels (causative, non-causative), animacy with two levels (object-animate, object-inanimate), and age groups with two levels (younger, older). The effect of each variable and their interactions will be examined.

*Wh*-subject questions (i.e., *Dare-ga V?*) and *wh*-object questions (i.e., *Dare-o V?* or *Nani-o V?*) were elicited from the children. The details of the experimental procedure were described in 3.1, so only sample interactions for subject elicitation and those for direct object elicitation are presented in the following.

**Sample interaction: for subject elicitation of the transitive verb *yomu* 'read’**

1. Showing first the picture where a panda is reading a picture book (Figure 3.7):

   E: Kore-wa panda-san da ne.
      'This is a panda.
      Kotti-wa nani kana?
      'What's this?'
   C: Ehon?
      'A picture book?'
   E: Soo. Hora, yonda-n da ne.
      'Right.' 'Look, (the panda) read (the picture book).'
Figure 3.7. The first picture used for the elicitation of a *wh*-subject of *yomu* 'read'.

Figure 3.8. Second pictures used for the elicitation of a *wh*-subject of *yomu* 'read'.

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2. The next two pictures were shown (Figure 3.8). Referring to the left one depicting two animals:

   E: Kore, dare kana?  
      'Who's this?'
   C: Usagi.  
      'A rabbit.'
   E: Soo ne. Zya, kore wa?  
      'Right.' 'How about this?'
   C: Saru.  
      'A monkey.'
   E: Soo, yoku wakaru ne.  
      'Right, you know well.'

3. Referring to the right picture depicting a covered entity reading a picture book:

   E: A, mite, hora yonda yo. (while pointing at the covered entity)  
      'Look, (X) read (the picture book).'
   E: Demo, kore mie-nai desyoo. Dakara Zyazzi ni kiite-mite.  
      'But we don't see this.' 'So can you ask the Judge (who),mid
   C: Nee, Zyazzi.  
      'The judge.'
   Z: Un.  
      'Yes.'
   C: Dare-ga yonda no?  
      'Who read (it)?'
   Z: Eeto ne, omimi-ga nagai hoo da yo.  
      'Well, that's the one whose ears are long.'
   C: Usagi!  
      'A rabbit!' 

4. The next picture was shown depicting the same event with the entity now uncovered (Figure 3.9).

   E: Attari! Yoku wakatta ne.  
      'Correct!' 'You're so great.'
Sample interaction: for direct object elicitation of the transitive verb osu 'push'

1. Showing the first picture where a dog is pushing a tiger (Figure 3.10):

   E: Kore-wa inu-san da ne.
      'This is a dog.'
   Kotti-wa dare kana?
      'Who's this?'
   C: Tora.
      'A tiger.'
   E: Soo. Mite, hora osita-n da ne.
      'Right.' 'Look, (the dog) pushed (the tiger).'</n
2. The next two pictures were shown (Figure 3.11). Referring to the left one depicting two animals:

   E: Kore, dare kana?
      'Who's this?'
   C: Raion.
      'A lion.'
   E: Soo ne. Zya, kore wa?
      'Right.' 'How about this?'
   C: Panda.
      'A panda.'
E: Soo, yoku wakaru ne.
'Reight, you know well.'

Figure 3.10. The first picture used for the elicitation of a *wh*-object for *osu* 'push'.

Figure 3.11. Second pictures used for the elicitation of a *wh*-object of *osu* 'push'.

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3. Referring to the right picture depicting a dog pushing a covered entity:

E: Nee, hora, osita yo. (while pointing at the covered entity)
   'Look, (the dog) pushed (X).'
E: Demo, kore mie-nai desyoo. Dakara Zyazzi ni kiite-mite.
   'But we don't see this.' 'So, can you ask the Judge (who)?'
C: Zyazzi.
   'The judge.'
Z: Un.
   'Yes.'
C: Dare-o osita no?
   'Who (did the dog) push?'
Z: Eeto ne, omemee-no mawari-ga kuroi hoo da yo.
   'Well, that's the one black rings around his eyes.'
C: Panda!
   'A panda!'

4. The next picture was shown depicting the same event with the entity now uncovered
   (Figure 3.12).

E: Attari! Yoku wakatta ne.
   'Correct!' 'You're so great.'

Figure 3.12. The third picture showing the answer of the wh-object of osu 'push'.
In the pictures, animals such as a dog and a cat were used as animate entities which were engaged in human activities. For the children's familiarization with the task, a brief practice session was held before the testing session. For practice, elicited sentences included wh-indirect objects (doko-ni for noboru 'climb' and iku 'go') and a wh-adjunct (doko-de for asobu 'play'), but sentences containing nominative and accusative case particles were not used in order to avoid carry-over effects. The experiment was carried out individually and took approximately 20 to 25 minutes per child. This experiment was conducted about a week after Experiment 1 began and continued for about two weeks. Those who were participating in both experiments had always done Experiment 1 before Experiment 2.

3.3.2 Overall results

All conversations were tape-recorded and the children's utterances were transcribed by the experimenter. The children's utterances were examined as to whether they were consistent with the target sentence. The scoring criterion adopted here is the same as Experiment 1. That is, the target sentence must have the sentence structure shown in (12).

(12) Wh-argument (+ case particle) + verb

Note that the target sentence may contain only one overt argument and a verb even though the verb is transitive. This is because a sentence containing one overt argument--either a subject or a direct object--is more natural than a two-overt-argument sentence in the context of the experiment. In fact, the experiment did not aim at eliciting sentences
involving two overt arguments. If the children produced sentences involving two overt arguments, those sentences were also considered to be consistent with the target but such sentences were rare: only 3.5% of all target sentences had two overt arguments. The *wh*-words *dare* 'who' or *nani* 'what' were expected, but *dore* 'which' or *dotti* 'which' were also acceptable and the children also used the latter two. If a sentence involved a non-*wh*-word, it was counted as a target sentence only when the argument was marked with a case particle. Such sentences were observed in two children's utterances and they were only 3.1% of all target sentences.

There were sentences incompatible with (12) for various reasons which are summarized in Appendix A. These utterances were excluded from further analysis. Out of 960 tokens, 907 utterances were considered to exhibit the target form. This proportion reached 94.5%, ranging from 90.8% for Type 2 objects to 98.3% for Type 2 subjects. A four-way repeated measures ANOVA was conducted to examine whether any of the main effects or the interaction effects were significant for the children's production of the target form. But, the results show that no effect was significant (Appendix B).

The target sentences were first examined to see if the *wh*-argument is marked with a case particle for case particle deletion. Then, morphological case-marking error types and frequency were analyzed.

### 3.3.3 Case particle deletion

For case particle deletion, Table 3.4 shows the results of the descriptive statistics. Percentages indicate rate of particle deletion relative to the total number of particles in the
Table 3.4 Proportions of Case Particle Deletion for Transitive Verbs

<table>
<thead>
<tr>
<th></th>
<th>Causative animate-animate (Type 1)</th>
<th>Causative animate-inanimate (Type 2)</th>
<th>Non-causative animate-animate (Type 3)</th>
<th>Non-causative animate-inanimate (Type 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subject</td>
<td>Object</td>
<td>Subject</td>
<td>Object</td>
</tr>
<tr>
<td>Younger</td>
<td>19.6%</td>
<td>23.5%</td>
<td>25.0%</td>
<td>24.0%</td>
</tr>
<tr>
<td>Older</td>
<td>9.7%</td>
<td>15.4%</td>
<td>7.7%</td>
<td>16.7%</td>
</tr>
<tr>
<td>Mean</td>
<td>15.3%</td>
<td>20.0%</td>
<td>17.5%</td>
<td>20.8%</td>
</tr>
</tbody>
</table>

target sentences. Overall, the accusative case particle was dropped more frequently than the nominative case particle across verb types. There also seems to be a tendency for younger children to drop case particles more often than older children.

Inferential statistics were performed to examine the effect of each independent variable: grammatical relations, verb semantics, animacy, and age groups. A four-way repeated measures ANOVA revealed a significant main effect of grammatical relations. All other main effects were found to be non-significant at alpha level .05. There was no significant interaction effect, either. These results are shown in Table 3.5.

The results are quite straightforward. First of all, there was a clear asymmetry in children's case particle deletion between subjects and direct objects. The accusative case particle was more likely to be dropped than the nominative case particle. This is consistent with what Otsu (1994) reports. Second, the present study found that there was no effect of verb semantics and animacy of arguments. Children's case particle deletion was not significantly affected by the semantic elements of causality. Also, the effect of animacy on
Table 3.5 ANOVA Table for Case Particle Deletion for Transitive Verbs

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age groups (AG)</td>
<td>.671</td>
<td>1</td>
<td>.671</td>
<td>.881</td>
<td>.356</td>
</tr>
<tr>
<td>Error</td>
<td>21.306</td>
<td>28</td>
<td>.761</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Subjects Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grammatical relations (GR)</td>
<td>.188</td>
<td>1</td>
<td>.188</td>
<td>5.100</td>
<td>.032</td>
</tr>
<tr>
<td>GR * AG</td>
<td>.065</td>
<td>1</td>
<td>.065</td>
<td>1.763</td>
<td>.195</td>
</tr>
<tr>
<td>Error(GR)</td>
<td>1.033</td>
<td>28</td>
<td>.037</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb semantics (VS)</td>
<td>.048</td>
<td>1</td>
<td>.048</td>
<td>2.858</td>
<td>.102</td>
</tr>
<tr>
<td>VS * AG</td>
<td>.064</td>
<td>1</td>
<td>.064</td>
<td>.000</td>
<td>.985</td>
</tr>
<tr>
<td>Error(VS)</td>
<td>.470</td>
<td>28</td>
<td>.017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animacy (AM)</td>
<td>.050</td>
<td>1</td>
<td>.050</td>
<td>2.001</td>
<td>.168</td>
</tr>
<tr>
<td>AM * AG</td>
<td>.106</td>
<td>1</td>
<td>.106</td>
<td>.626</td>
<td>.436</td>
</tr>
<tr>
<td>Error(AM)</td>
<td>.698</td>
<td>28</td>
<td>.025</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GR * VS</td>
<td>.009</td>
<td>1</td>
<td>.009</td>
<td>.371</td>
<td>.547</td>
</tr>
<tr>
<td>GR * VS * AG</td>
<td>.001</td>
<td>1</td>
<td>.001</td>
<td>.034</td>
<td>.855</td>
</tr>
<tr>
<td>Error(GR * VS)</td>
<td>.672</td>
<td>28</td>
<td>.024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GR * AM</td>
<td>.000</td>
<td>1</td>
<td>.000</td>
<td>.009</td>
<td>.924</td>
</tr>
<tr>
<td>GR * AM * AG</td>
<td>.000</td>
<td>1</td>
<td>.000</td>
<td>.009</td>
<td>.924</td>
</tr>
<tr>
<td>Error(GR * AM)</td>
<td>.608</td>
<td>28</td>
<td>.022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VS * AM</td>
<td>.015</td>
<td>1</td>
<td>.015</td>
<td>.643</td>
<td>.430</td>
</tr>
<tr>
<td>VS * AM * AG</td>
<td>.000</td>
<td>1</td>
<td>.000</td>
<td>.000</td>
<td>.998</td>
</tr>
<tr>
<td>Error(VS * AM)</td>
<td>.656</td>
<td>28</td>
<td>.023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GR * VS</td>
<td>.000</td>
<td>1</td>
<td>.000</td>
<td>.032</td>
<td>.860</td>
</tr>
<tr>
<td>GR * VS * AM</td>
<td>.020</td>
<td>1</td>
<td>.020</td>
<td>1.875</td>
<td>.182</td>
</tr>
<tr>
<td>Error(GR* VS * AM)</td>
<td>.299</td>
<td>28</td>
<td>.011</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

argument NPs seems to have been irrelevant to the children's case particle deletion. In sum, this phenomenon in child grammar was found to be quite independent.

Even the effect of age was not significant. This suggests that children's performance on case particle deletion is consistent throughout their language development, which in turn suggests that their knowledge of case particle deletion, at least
in terms of nominative vs. accusative, may be identical to adults' knowledge almost from the beginning of language acquisition.

One of the hypotheses formulated in Experiment 1 was tested at this point. For intransitive verbs, children tended to retain the nominative case particle for subjects, but there was no contrast between unergative and unaccusative verbs. One possibility I considered was that the artificial experimental situation might have influenced the children to retain the particle (see discussion in 3.2.3). However, if this were the case, the children should also have retained equally both nominative and accusative in the present experiment. The asymmetry observed in this experiment suggests that experimental artifact is not the reason for the nominative retention in Experiment 1.

Does the nominative-accusative asymmetry in the present experiment truly reflect the children's knowledge of case particle deletion? The results are compatible with Otsu's (1994) and Miyata's (1992) studies which claim to support of the principles of Universal Grammar (UG). However, if there are other possibilities which might possibly explain the asymmetry, they must be considered before we appeal to inborn principles such as those in UG and/or the operation of an innate language faculty. Here, I would like to consider two factors which might possibly account for the children's nominative-accusative asymmetry for case particle deletion, although I need to wait until chapter 4 to provide my conclusions.

---

6 In 2.2, I have presented several versions of a case particle deletion rule. Here, the knowledge of case particle deletion refers to the version stated in terms of a nominative-accusative asymmetry.
The first plausible factor lies in the semantic functions of the nominative case particle. The semantic functions of *ga* include exhaustive listing and focus (see 2.3.1). If children are sensitive to these functional aspects of the nominative case particle, they might tend to retain *ga* to fulfill its functions in a sentence. In contrast, because the accusative particle has no connotation of exhaustive listing and obviously a lesser focusing effect than nominative *ga*, the children might tend to drop the accusative case particle. This could account for the difference between nominative and accusative case particles, but not necessarily for the difference in grammatical relations and structural positions of argument NPs. Therefore, if the semantic functions of *ga* are the reason for its retention, children should retain the nominative case particle regardless of whether it marks a subject or a direct object in a sentence. As suggested in 3.2.3, in order to test this hypothesis, we need to examine stative verbal constructions. I will report on the experiment investigating this point in chapter 4.

The second possibility is to appeal to input factors. That is, if input explicitly tells the child to drop the accusative case particle and to retain the nominative case particle, the child would simply be following the input data. For language learning to take place, input is necessary. And in fact, parental input must be consistent with the target grammar. In particular, we expect a nominative-accusative asymmetry in parental input. Can we say that the child learns the nominative-accusative asymmetry from parental input and that no consideration of the syntactic constraint is necessary?

First of all, the input account has nothing to tell us about why there exists a syntactic constraint in the target grammar. A second problem with this account is that we
do not know exactly how much input is required. An implicit assumption is that if relatively consistent and explicit evidence is available in input, learning from input is likely. While this account might be applicable to the children's case particle deletion, it apparently fails to predict the children's case-marking errors described in the next section. In my view, therefore, the input account seems to leave much room for argument. I will come back to input issues in chapter 5.

3.3.4 Morphological case-marking

Case-marking errors were assessed for sentences containing case particles on argument NPs. Since only overt use of case particles was considered to be relevant for these analyses, dropped case particles were not counted as errors. Thus, the criterion for case-marking errors was the incorrect use of overt case particles: a subject marked with a case particle other than nominative ga and a direct object marked with a case particle other than accusative o. Some children made self-correction(s), resulting in either a correct or incorrect sentence. In this case, the children's last utterance (always the second utterance) was treated as the sentence to be evaluated. Inappropriate use of question words (e.g., dare 'who' for inanimate, and nani 'what' for animate) were not regarded as case-marking errors. Table 3.6 summarizes the results of the descriptive statistics: the

---

7 Although ni-marked objects may not necessarily be errors for certain causative verbs in certain contexts, such use was considered incorrect in the context of the present experiment. This will be discussed in 3.3.4.2 and 3.3.4.5.
Table 3.6 Proportions of Morphological Case-marking Errors for Transitive Verbs

<table>
<thead>
<tr>
<th></th>
<th>Causative animate-animate (Type 1)</th>
<th>Causative animate-inanimate (Type 2)</th>
<th>Non-causative animate-animate (Type 3)</th>
<th>Non-causative animate-inanimate (Type 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subject</td>
<td>Object</td>
<td>Subject</td>
<td>Object</td>
</tr>
<tr>
<td>Younger</td>
<td>22.6%</td>
<td>55.9%</td>
<td>11.8%</td>
<td>41.7%</td>
</tr>
<tr>
<td>Older</td>
<td>12.2%</td>
<td>44.2%</td>
<td>5.8%</td>
<td>19.9%</td>
</tr>
<tr>
<td>Mean</td>
<td>18.1%</td>
<td>50.8%</td>
<td>9.2%</td>
<td>32.2%</td>
</tr>
</tbody>
</table>

Table 3.7 ANOVA Table for Morphological Case-marking Errors for Transitive Verbs

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age groups (AG)</td>
<td>.970</td>
<td>1</td>
<td>.970</td>
<td>4.186</td>
<td>.050</td>
</tr>
<tr>
<td>Error</td>
<td>6.490</td>
<td>28</td>
<td>.232</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Subjects Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grammatical relations (GR)</td>
<td>3.949</td>
<td>1</td>
<td>3.949</td>
<td>7.691</td>
<td>.010</td>
</tr>
<tr>
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<td>.202</td>
<td>.393</td>
<td>.536</td>
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<tr>
<td>Error(GR)</td>
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<td>28</td>
<td>.513</td>
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<td></td>
</tr>
<tr>
<td>Verb semantics (VS)</td>
<td>.142</td>
<td>1</td>
<td>.142</td>
<td>6.354</td>
<td>.018</td>
</tr>
<tr>
<td>VS * AG</td>
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<td>.001</td>
<td>.037</td>
<td>.848</td>
</tr>
<tr>
<td>Error(VS)</td>
<td>.626</td>
<td>28</td>
<td>.022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animacy (AM)</td>
<td>.984</td>
<td>1</td>
<td>.984</td>
<td>24.041</td>
<td>.000</td>
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<td>.041</td>
<td></td>
<td></td>
</tr>
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<td>.013</td>
<td>.760</td>
<td>.391</td>
</tr>
<tr>
<td>GR * VS * AG</td>
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<td>1</td>
<td>.015</td>
<td>.893</td>
<td>.353</td>
</tr>
<tr>
<td>Error(GR * VS)</td>
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<td>28</td>
<td>.017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GR * AM</td>
<td>.274</td>
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<td>.274</td>
<td>9.143</td>
<td>.005</td>
</tr>
<tr>
<td>GR * AM * AG</td>
<td>.106</td>
<td>1</td>
<td>.106</td>
<td>3.542</td>
<td>.070</td>
</tr>
<tr>
<td>Error(GR * AM)</td>
<td>.838</td>
<td>28</td>
<td>.030</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VS * AM</td>
<td>.006</td>
<td>1</td>
<td>.006</td>
<td>.452</td>
<td>.507</td>
</tr>
<tr>
<td>VS * AM * AG</td>
<td>.046</td>
<td>1</td>
<td>.046</td>
<td>3.371</td>
<td>.077</td>
</tr>
<tr>
<td>Error(VS * AM)</td>
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<td>28</td>
<td>.014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GR * VS * AM</td>
<td>.013</td>
<td>1</td>
<td>.013</td>
<td>.640</td>
<td>.430</td>
</tr>
<tr>
<td>GR * VS * AM * AG</td>
<td>.002</td>
<td>1</td>
<td>.002</td>
<td>.111</td>
<td>.741</td>
</tr>
<tr>
<td>Error(GR* VS * AM)</td>
<td>.557</td>
<td>28</td>
<td>.020</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
percentages indicate the proportion of errors relative to the total number of the target sentences.

A repeated measures four-way ANOVA was conducted. The results are summarized in Table 3.7. A main effect of grammatical relations was significant, reflecting the fact that the children made errors more frequently on direct objects than on subjects. A main effect of verb semantics was also found to be significant. This is because the children made errors more frequently for causative verbs (Types 1 and 2) than for non-causative verbs (Types 3 and 4). For both subjects and direct objects, there were more errors for causative verbs than for non-causative verbs. A main effect of animacy was also significant, reflecting the larger number of errors for verbs taking animate direct objects (Types 1 and 3) than for verbs taking inanimate direct objects (Types 2 and 4). This difference seems to suggest that the errors with animate-object verbs were mainly due to errors on direct objects. This is confirmed by a significant interaction effect between animacy and grammatical relations. Lastly, a main effect of age group was found with a probability value .05. This fails to reject the null hypothesis, but I regard this as marginally significant.

Regarding error types, the predominant errors were overextension of the nominative case particle to the direct object and the accusative case particle to the subject. Only a small number of dative overextensions were found, a point to which I will return in 3.3.4.2 and 3.3.4.5. Note also that the misuse of the topic particle wa was observed only
once, although this is not counted as an error since this does not conform to the target form.

In general, there are two important findings which are not reported in previous studies. One is that case-marking errors were not rare at all. Unlike studies of naturalistic data of children's spontaneous speech, the experimental manipulation revealed many errors, some of which had a rate of occurrence of around 50%. As already mentioned, the elliptical character of Japanese seems to contribute to a low frequency of errors for transitive verbs in children's spontaneous speech. Another remarkable finding is that the errors were rooted in multiple factors. Grammatical relations, verb semantics, animacy, and age are all contributing factors in children's case-marking errors. In the following sections, I will look at these factors one by one.

3.3.4.1 Grammatical relations: subject vs. direct object

Regarding grammatical relations and case-marking, errors were predominantly made on direct objects. Overall, object errors occurred in almost 40% of the total target sentences, whereas subject errors occurred around 10%, as shown in Figure 3.13. This suggests that children have more difficulty in using the accusative case particle on a direct object than using the nominative case particle on a subject. Errors were in fact bi-directional because overextension of the accusative case particle to a subject NP was also observed.

---

8 The topic particle was used for a subject of a Type 3 verb by one child (3;8).
An interesting fact emerges when we look at the individual children's performance. Table 3.8 shows the number of children who made overextension errors—either on subjects or objects—more than 50% of the time across verb types. The table indicates that six children used the nominative case particle for direct objects and two children used the accusative case particle for subjects more often than by chance. Closer consideration of these children's performances revealed that among the six children, only one child made errors on subjects. All others were error-free for subjects, which suggests that their case

<table>
<thead>
<tr>
<th></th>
<th>Overextension of accusative to subjects</th>
<th>Overextension of nominative to direct objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Older</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 3.8 The Number of Children Who Made More Than 50% Overextension Errors Across Verb Types
particle was almost exclusively restricted to *ga*. Also, neither of the children who overextended the accusative case made any errors on direct objects. Thus, they almost always used *o* for any argument NP.

These results suggest that it is likely that these children are employing the case-marking strategy I proposed in 3.2.4. The nominative strategy—marking an overt argument in a sentence with the nominative case particle—accounts for the performance of the six children who overextended the nominative case. Recall that children were almost error-free for subject case-marking for intransitive verbs in Experiment 1, and I have considered the possibility that they are using the nominative strategy. The nominative strategy and correct case-marking predict the same results for intransitive sentences. However, if the nominative strategy was being used, an overextension of the nominative case should also occur in transitive sentences. The results of the present experiment are compatible with this prediction. The involvement of the nominative strategy is likely for transitive verbs, and the same might also be true for intransitive verbs.

The other direction for overextension—overextension of the accusative case particle to a subject—may be informative about the possible use of a case-marking strategy in general. In Experiment 1, one child (ST) almost always used the accusative case to mark the argument of an intransitive verb (see 3.2.4). Interestingly, in the present experiment, the same result was observed for two children. One of them is ST. The other child, unfortunately, was not tested in Experiment 1.

In order to account for both the nominative and the accusative strategies, the one argument—one particle strategy proposed in 3.2.4 is repeated here in (13).
(13) One argument-one particle strategy: If a sentence contains one and only one overt argument, choose one particle to mark it regardless of its grammatical relation.

At this point, I think there are two naturally arising questions. One is why children might employ such a strategy. And the other is why the nominative strategy is predominant. The answer to the first question seems straightforward to me. If children have stable knowledge about morphological case-marking, such a strategy may not override their grammar. As shown in Table 3.8, all children who exhibited the strategy were from the younger group. At around age 3 and 4, therefore, children may not have completed learning morphological case-marking and they might be susceptible to a simple solution such as (13). However, as age increases, the children seem to give up the strategy, whereas errors rooted in other factors may persist and learning continues.

Regarding the predominance of the nominative strategy, here I would like to consider two plausible causes. First, a possibility suggested by William O'Grady (personal communication) lies in the semantic functions of ga (i.e., focus or exhaustive listing; see 2.3.1). In the present experiment, wh-arguments were elicited from the children. Since wh-arguments by nature call for new information, they are likely to be focused; therefore, they may be associated with the nominative case particle. This leads to a simple prediction, which is that the children would not overextend the nominative case to direct objects when the object NPs are not focused--at least when they are not new information. Naturalistic data suggest that the overextension of nominative is not restricted to wh-arguments (see, for example, Clancy, 1985). However, since non-wh-arguments may also be focused or
may convey new information depending on the context, a careful discourse analysis would be necessary to investigate this possibility.

The second cause might be the influence of parental input. Since the children did make errors, input may be somehow misleading for children learning morphological case-marking. If, for example, input includes a predominant number of nominative case particles because accusative case particles are more likely to be dropped, children might use *ga*, simply because they regard *ga* as the only possible case-marker for argument NPs. In chapter 5, I will come back to input issues.

3.3.4.2 Verb semantics: causative vs. non-causative

One new finding in this experiment involves the effect of verb semantics regarding causality. The children made errors on causative verbs more frequently than on non-causative verbs, as shown in Figure 3.14. Focusing on the object-marking errors in this section, I would like to discuss the source of the errors along two lines.

A simple solution to account for the results is to assume that the children are adopting a strategy of associating thematic roles with case particles as in (14).

(14) Semantic association strategy: Children associate a particular thematic role with a particular case particle.

Since the thematic roles of arguments and case particles are only weakly correlated, children are likely to make errors if they try to associate the semantic properties of argument NPs with specific case particles. The predominant errors on direct objects of causative verbs may be due to their semantic complexity. In a rather simplified way, the
Figure 3.14. Case-marking errors in terms of verb semantics.

Semantic properties of non-causative and causative verbs may be represented as follows.

(15) $X$ acts on $Y$  \hspace{1cm} (non-causative transitive)

(16) $X$ causes $Y$ to become $Z$  \hspace{1cm} (causative)

Compared with the non-causative transitive verbs in (15), the causative verbs in (16) are more complex, because the latter consists of two propositions.

Now, recall that Pinker (1989) suggests that the thematic role of the direct object of a causative verb is labeled as both patient and theme, while the object of a non-causative verb is simply patient (see 2.3.3). The double labeling for causative objects is the reflection of the semantic structural complexities of causative verbs shown in (16). That is, in (16) $Y$ is not only the patient of the action taken by $X$ but also the theme of the change of state or location to $Z$. In general, the patient label is almost restricted to direct objects, while theme is a semantic property of subjects as well, specifically for the subject of an

82
unaccusative verb. The direct object of a causative verb usually has these semantic properties. Therefore, the children might have been perplexed about which case-marker to choose if they are using a strategy like (14).

The second account also appeals to the semantic aspects of causality, but unlike the strategy account, it attributes the children's case-marking errors to their misanalyses of the lexical semantic structure for the syntactic projection. Assuming that (16) represents the semantic character of causative verbs, I propose two plausible analyses for children's case-marking errors. They are stated in (17) and (18).

(17) Intransitive analysis: Children take the causative to be an intransitive verb and the causee is projected as the subject of the sentence.

(18) Causativization analysis: Children express a causal event by taking the causee to be a volitional agent.

What is common in these two misanalyses is that the causee is not regarded as a direct object in syntax; therefore, it is marked with case particles other than accusative o. I suggest that (17) may apply for both Type 1 and Type 2 verbs, while (18) applies only for Type 1 verbs.

Table 3.9 shows the lexical semantic representation of the two types of causative verbs tested in the experiment, and their plausible analyses for syntactic projection. In the intransitive analysis, a causee Y is projected into the syntax in both Type 1 and Type 2 verbs. Since the causee is the sole overt argument of the verb, it becomes the subject and is marked with the nominative case. What would motivate this? I think that this analysis might be the result of children's focus on the change of state (or location) in the event. As
Table 3.9 Lexical Semantic Representation and Syntactic Representation of Causative Verbs

<table>
<thead>
<tr>
<th>Lexical semantic representation</th>
<th>Type 1 causative: internally caused verb (e.g., okosu 'get up')</th>
<th>Type 2 causative: externally caused verb (e.g., akeru 'open')</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X (John) causes Y (Mary) to get up</td>
<td>X (John) causes Y (a door) to become open</td>
</tr>
<tr>
<td>Transitive structure: correct analysis</td>
<td>John-ga Mary-o okosita. John-Nom Mary-Acc got up 'John got Mary up.'</td>
<td>John-ga doa-o aketa. John-Nom doa-Acc opened 'John opened the door.'</td>
</tr>
<tr>
<td>Intransitive analysis</td>
<td>*Mary-ga okosita Mary-Nom got up ('Mary got up.')</td>
<td>*Doa-ga aketa door-Nom opened ('The door opened.')</td>
</tr>
<tr>
<td>Causativization analysis</td>
<td>*John-ga Mary-ni okosita John-Nom Mary-Dat got up ('John got Mary up.')</td>
<td>*John-ga doa-ni aketa John-Nom door-Dat open ('John opened the door.')</td>
</tr>
</tbody>
</table>

mentioned before, the semantics of a causative verb contains two propositions: one 'X causes Y' and the other 'Y becomes (goes to) Z', each of which is shown in square brackets in (19).

(19)  \[X \text{ causes } Y \] \[Y \text{ gets up} \]

\[X \text{ causes } Y \] \[Y \text{ opens} \]

In these examples, the second proposition, called the central event (Hale & Keyser, 1987), is generally perceptually more salient than the first one; therefore, the children might have focused on the central event, considering only it for the syntactic projection. The perceptual saliency of the central event seems likely because the first proposition merely
denotes a general notion of CAUSE whereas the second has the semantic content (get up, open) of the actual change of state.

The other analysis I proposed is causativization, by which I mean the same processes involved in productive causatives. As I explained in 2.3.3, Japanese has two types of causatives: one lexical (irregular) and the other productive. If the lexical causative is used, case-marking will be correct in transitive structures: the causer X is marked with nominative and the causee Y with accusative. However, if the productive causative is used, case-marking shifts might be more likely: the causee Y can be marked with ni, on the condition that acts as a volitional agent in the event.

This predicts that the causativization analysis is possible only for Type 1 verbs, since the inanimate causee of Type 2 verbs cannot carry the notion of a volitional agent. In order to examine whether the children follow this, I calculated the frequency of ni-marked and ga/o-marked errors for the two types of causative verbs. The results are shown in Table 3.10. As predicted, ni-marked causees occurred only with Type 1 verbs.

<table>
<thead>
<tr>
<th></th>
<th>Type 1 causative</th>
<th>Type 2 causative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ni</td>
<td>ga/o</td>
</tr>
<tr>
<td>Subject</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Direct object</td>
<td>6</td>
<td>52</td>
</tr>
</tbody>
</table>

In the context of the experiment, a causee's volitionality and agentivity were irrelevant; therefore, all ni-marked causees were classified as errors. For example, the
event of *nakasu* 'make someone cry' was depicted in a picture in which an animate entity
hits another animate so that it cries. In this situation, it is incorrect to use a *ni*-marked
causee. However, if a special context is given so that the causee may volitionally be
engaged in the event (for example, imagine the context where a film director tells an actor
to cry in a scene), *ni*-marking is possible for certain causatives. Among the four verbs in
Type 1, *nakasu* 'cry' and *yorokobasu* 'please' might be used with a *ni*-causee. In
Table 3.10, 4 out of 6 *ni*-marked errors involved these two verbs. Thus, the children's
case-marking errors of this type could be caused by discourse or pragmatic factors.

Before leaving this section, I would like to emphasize that no single account can
fully explain children's case-marking errors. As I have suggested before and as is obvious
from the statistical results, multiple factors contribute to children's case-marking errors. I
have been trying to disentangle the factors by formulating a variety of hypotheses, but
some factors might override others, and this makes it difficult to investigate further.

### 3.3.4.3 Animacy: animate-object vs. inanimate-object

The children made errors more frequently for verbs taking animate direct objects
than for verbs taking inanimate direct objects. This is represented by the contrast between
Types 1 and 3 verbs and Types 2 and 4 verbs as shown in Figure 3.15. The higher
proportions of errors for Types 1 and 3 verbs may be attributed to verb reversibility: the
interchangeability of a subject entity and an object entity without affecting the logical
acceptability of the sentence. Because Types 1 and 3 verbs, which have both animate
subjects and animate objects, are reversible, a simple account of the children's errors for
Figure 3.15. Case-marking errors in terms of object-animacy and grammatical relations.

these verbs might be due to mistakes (i.e., simple confusions) in understanding subjects and direct objects in instructions, cue sentences, and/or pictures in the experiment. If this were the case, however, subject-marking errors should also have been more frequent for reversible verbs than for non-reversible verbs, because such confusion can be expected to have equally happened for both subject questions and object questions. Although there was a tendency for reversible verbs (Type 1 & Type 3) to have subject errors more frequently than non-reversible verbs (Type 2 & Type 4), the interaction effect between animacy and grammatical relations was significant, $F(1, 28) = 9.143^*, p = .005$. This is interpreted to indicate that animacy affected the children's performance on object-marking more than on subject-marking. Thus, the results suggest that verb reversibility is not the main factor in the animacy effect.
Then, why did the children make errors on animate objects more frequently than on inanimate objects? My suggestion is the involvement of prototype effects. What I refer to as a prototype\(^9\) is a rather informal notion, but it is a well known fact that a typical transitive sentence in Japanese has an animate subject marked with the nominative case particle and an inanimate direct object with the accusative case particle. In light of this, Types 1 and 3 verbs diverge from the prototype in that they have animate direct objects. A plausible account for the children's overextension of nominative is that they associate argument animacy and case particles as prototype patterns: animate-nominative and inanimate-accusative.

(20) Prototype effect: Children associate animacy with the nominative case particle and inanimacy with the accusative case particle.

This solution could also account for why the children did not make errors on subjects as frequently as on direct objects. Because all subjects used in the experiment were animate, they were consistent with the prototype. But, this in turn predicts that children may make errors on subjects when they denote inanimate entities. Although it remains to be seen whether this happens, there is a suggestion that this might not be true in the results of Experiment 1.

In Experiment 1, both animate and inanimate subjects were elicited for intransitive verbs, but except for two children, one of whom exhibited the one argument-one particle strategy (see 3.2.4), no child used the accusative case particle on the subjects. Thus, for

\(^9\) 'Prototypical' and 'canonical' discussed by Slobin (1981) are used in a technical sense for his proposal of acquisition procedures. I am not using 'prototype' in Slobin's sense here.
subjects of intransitive verbs, there seems to be no effect of animacy and prototype. But notice that the prototype of intransitive verbs must be different from that of transitive verbs. Intransitive verbs often select inanimate subjects as well as animate subjects, since many unaccusative verbs select inanimate subjects. Thus, inanimate-subjects or inanimate-nominate may also be a prototype for intransitive verbs. Subjects of intransitive verbs and subjects of transitive verbs must be treated differently for prototype, although both are marked with nominative case particles. Thus, the prototype effect in (20) must be stated in terms of transitive sentences.

3.3.4.4 Subject-marking errors

Case-marking errors on subjects all involved overextension of the accusative case particle except for two cases of dative misuse. Some of the accounts and hypotheses I have proposed in the above sections may also be applicable to subject-marking errors. Reversibility mistakes (3.3.4.3), the semantic association strategy (3.3.4.2), and the one argument-one particle strategy (3.3.4.1) are concerned with the overextension of the accusative case particle to subjects as well as the overextension of the nominative case particle to direct objects.

However, so far, I have no grammatical explanation specifically for subject-marking errors. Perhaps we need a combination of the strategic and processing factors investigated here, some of which did not emerge as statistically significant effects, to account for the relatively small number of errors.
3.3.4.5 Overextension of *ni*

The children's case-marking errors were not limited to overextension of the nominative and accusative case particles. There were also some cases where the dative-marker *ni* was used. Figure 3.16 shows the numbers of nominative, accusative, and dative case particles that the children used for argument NPs when they made errors. Despite the relatively small number, overextension of *ni* did occur. In chapter 2, I did not describe in detail the use of dative *ni* except its use for subject-marking of stative verbal constructions, since dative case-marking is not my focus. But, as mentioned before, dative is used to mark an indirect object as well. There are in fact a variety of syntactic and semantic functions of dative *ni*, and its syntactic status is controversial. (For detailed analyses and discussion, see, for example, Kuno, 1973; Miyagawa, 1989; Sadakane &

![Figure 3.16. Numbers of case particles erroneously used for each type of verb.](image)
Koizumi, 1995.) For these reasons, I think it is difficult to identify, first, which *ni* was used by the children, and second, the reason why they used it.

I have explained in 3.3.4.2 the dative-marked objects for Type 1 verbs. In brief, I attributed the children's use of the *ni*-causee to their causativization analysis, where *ni*-marked causee is allowed when it is a volitional agent. Although the children's analysis was pragmatically incorrect because the causee was not a volitional agent in the experiment, their analysis was in a general sense consistent with the target grammar. If the children's causativization analysis is the reason for their overextension of *ni* to direct objects, they may use the dative case particle for an animate object but not for an inanimate object, because only the former is a potential agent. This seems to be true because the overextension of the dative never occurred for Type 2 causatives or Type 4 transitives, both of which select inanimate objects.

On the other hand, dative overextension happened to the direct objects of Type 3 verbs and the subjects of Type 1 verbs, for which I do not have a good explanation so far since the causativization analysis does not apply to them. I would just like to note that the errors were observed for three verbs in Type 3 (*osu* 'push', *kamu* 'bite', and *keru* 'kick')\(^{10}\) and for one verb in Type 1 (*yorokobasu* 'please').

\(^{10}\) Note that *kamu* 'bite' is used with the dative case particle when it is combined with -*tuku* 'attach' (lit.), resulting in a compound *kami-tuku* 'bite'. In this case, the object of the verb is compatible with either accusative or dative.
3.3.4.6 Age

Finally, the results of the inferential statistics (Table 3.7) show that an effect of age was only marginally significant, \( F(1,28) = 4.186, p = .05 \). Usually, an expectation from a developmental perspective is that errors decrease as age increases; therefore, age may be a correlate of language development. However, the results obtained here indicate little effect of age. But this does not mean that children's learning of morphological case does not take place at preschool ages. If learning takes place gradually, it may not be reflected in a statistically significant effect. In fact, at least descriptively, errors do decrease with age as Figure 3.17 shows, but the change between age groups was only barely significant.

Figure 3.17. Case-marking errors in terms of age groups.
From a different point of view, it is possible to say that errors persist. Some aspects of children’s grammar may see a dramatic improvement in preschool years, but morphological case does not seem to be of that kind. Learning appears to be slow and to continue until school age.

3.3.5 Summary of Experiment 2

This section lists the main findings of Experiment 2, followed by the accounts and hypotheses I formulated to explain the results. Some hypotheses were formulated for Experiment 1 and tested in Experiment 2, while others are newly formulated and will be further investigated.

Main findings: case particle deletion

1. For transitive sentences, the children dropped the accusative case particle more frequently than the nominative case particle.

2. There was no effect of verb semantics.

3. There was no effect of animacy.

4. There was no effect of age.

Hypotheses: case particle deletion

a. Syntactic constraint: The children’s performance is compatible with the target grammar where the syntactic constraint (represented as the nominative-accusative asymmetry) is imposed. (This is further investigated in Experiment 3.)
b. Semantic functions of *ga*: The nominative case particle was retained more often than the accusative case particle because the former has the semantic functions of exhaustive listing or focus as well as neutral description. (This will be tested in Experiment 3.)

c. Input: Parental input gives children information about case particle deletion. (This is discussed in chapter 5.)

**Main findings: morphological case-marking**

5. Case-marking errors were not rare.

6. Errors involve incorrect use of nominative, accusative and dative, but most errors involved the first two case particles.

7. Overextension of the nominative case particle to a direct object was more frequent than that of the accusative case particle to a subject.

8. The children made errors on causative verbs more frequently than on non-causative verbs.

9. The children made errors for verbs taking animate direct objects more frequently than for verbs taking inanimate direct objects. Object-animacy affects the children's errors on the direct object

10. There were a few cases of the overextension of dative *ni* to animate objects.

11. Children's learning of morphological case takes place gradually in preschool years and continues until school age.
Hypotheses: morphological case-marking

d. Strategy hypothesis: The one argument-one particle strategy was evidenced in this experiment as well as in Experiment 1. The children tended to use one case particle (either ga or o) for the sole overt argument in a sentence.

e. Semantic functions of ga: Children use the nominative case particle for wh-arguments because ga calls for new information. (New information and ga are likely to be associated.)

f. Input account: Parental input might provide information which causes errors.

g. Semantic association strategy: Children associate a particular thematic role of an argument with a particular case particle.

h. Intransitive analysis: Children take the causative to be an intransitive verb and the causee is projected as the subject of the sentence.

i. Causativization analysis: Children express a causal event by taking the causee to be a volitional agent.

j. Verb reversibility: When the arguments are reversible, children may make mistakes in understanding subjects and direct objects in instructions, cue sentences, and/or pictures in the experiment.

k. Prototype effect: Children associate animacy with the nominative case particle and inanimacy with the accusative case particle for arguments of transitive verbs.
CHAPTER 4

CASE FOR DYADIC STATIVE VERBALS

This chapter reports on two experimental studies investigating children's acquisition of case for dyadic stative verbs as compared with that for non-stative transitive verbs. Experiment 3 is a continuation of the studies reported in chapter 3, investigating children's knowledge of case particle deletion and morphological case-marking in an elicited production task.

Given the children's knowledge of case particle deletion demonstrated for transitive verbs in Experiment 2, Experiment 3 further investigates its availability for dyadic stative verbs. Also, the children's use of morphological case-marking on subjects and direct objects of stative verbs is examined. As a number of case-marking errors were observed in Experiment 2, especially on direct objects, it is of interest how children perform for dyadic stative verbal constructions, where both subjects and direct objects are marked with the nominative case particle.

Experiment 4 also investigates the children's morphological case-marking, but it tests a different aspect of case-marking, adopting a different method. What is investigated in the experiment may be called morphological bootstrapping, by which it may be possible for children to infer verb meanings from morphological case-marking patterns. Since double nominative case-marking is associated with stative verbs and nominative-accusative case-marking with non-stative transitive verbs, it is assumed that the target grammar involves knowledge that associates verb meanings with case-marking patterns.
Unlike other experiments assessing children's production of case particles for given verbs, Experiment 4 tests meanings of novel verbs (i.e., made up verbs) given with two case-marking patterns. The questions addressed in this experiment include whether the children can make use of the morphological cues of case-marking for learning [+stative] meanings of novel verbs, and which case-marking pattern—double nominative or nominative-accusative—is easier and earlier for learning.

4.1 Experiment 3: Dyadic stative verbals

The main findings of the previous two experiments showed that children often dropped the accusative case particle from direct objects but tended to retain the nominative case particle on subjects. Unlike morphological case-marking, children's case particle deletion does not seem to be affected by verb semantics, argument-animacy or the children's ages. This seems to suggest that the syntactic constraint involved in case particle deletion is quite independent.

The experiment presented here investigates children's performance on dyadic stative verbal constructions (see chapter 2) for both case particle deletion and morphological case-marking. The stative verbal constructions offer a unique context where correspondences between case particles and grammatical relations depart from the canonical nominative-accusative pattern.

For case particle deletion, I have presented two versions of the syntactic constraint in chapter 2: one referring to types of case particles (i.e., nominative vs. accusative) and the other to grammatical relations and their syntactic positions as in (1) and (2).
(1) Nominative-accusative asymmetry: The accusative case particle may be deleted, whereas the nominative case particle may not.

(2) Subject-object asymmetry: A case particle on a direct object NP may be deleted, while that on a subject NP may not.

So far, the results are compatible with (1) in that the children tended to retain the nominative case particle in Experiments 1 and 2. What do these results say about (2)? The results of Experiment 2—the children's nominative-accusative asymmetry—are consistent with (2), whereas the children's performance in Experiment 1 is not. They did not differentiate unaccusative verbs from unergative verbs in terms of omissibility of case particles. Because I have assumed that the argument of an unaccusative verb is the sister of V, the results of the first experiment are incompatible with (2).

As mentioned before, however, this does not necessarily mean that the children's grammar is different from the target grammar. Remember that the children's performance was in fact consistent with adults' judgments as reported in Hirakawa (to appear). Thus, it is plausible that both children's and adults' knowledge of the omissibility of case particles may be governed by the same linguistic constraint. If this is true, it might be the description of the target grammar that needs revision, a point to which I will return in 5.2.3.

For now, considering the evidence from children's nominative-accusative asymmetry in Experiment 2, is it possible that their knowledge of case particle deletion is as represented in (2)? Since not all subject-object relations are marked with nominative-accusative case-marking, we need to examine the non-canonical case-marking pattern for
stative verbals. Crucially, the motivation for the asymmetry in (2) lies in a constraint on
the hierarchical structural representation of subjects and direct objects, where language-
particular morphological case particles are not relevant. Regardless of the types of case
particles employed (e.g., nominative or accusative), it is a syntactic constraint which must
be invoked. Thus, if the children's performance can be explained in terms of case particles
without reference to the structural positions of subject and direct object, it follows that
knowledge of the omissibility of case particles may not be syntactically based.

However, there is a possibility that the children showed the nominative-accusative
asymmetry for a different reason. For both retention and overextension of the nominative
case particle, I have suggested an account that appeals to the semantic functions of *ga.*
Simply stated, since *ga* has the semantic functions of denoting exhaustive listing or focus
(see 2.3.1), it may be more likely to be retained so that its functions may be fulfilled in a
sentence. To the extent that this is true, the children's deletion of case particles is not
rooted in the syntactic constraint. Let me frame this as the functional hypothesis in (3).

(3) Functional hypothesis: Children tend to retain a nominative case particle so that its
semantic functions can be fulfilled.

Stative verbal constructions offer an ideal context to test this hypothesis. This is
because in stative verbal constructions both the subject and the direct object are marked
with the nominative case particle *ga* as in (4).

(4) John-*ga* eigo-*ga* dekiru.
John-Nom English-Nom can
'John can speak English.'
We need to ask whether both *ga* in (4) has the connotation of exhaustive listing or focus. As discussed in 2.3.1, at least the focusing function in Shibatani's (1990) sense is available even when *ga* marks the direct object. As Shibatani (1990) suggests, I treat the focusing effect as a matter of degree, which is stronger for *ga* than for *o*.

If the functional hypothesis is correct, children should retain *ga* equally for subjects and direct objects and there would be no asymmetry between subject-marking *ga* and object-marking *ga*. If, on the other hand, children's case particle deletion is due to the syntactic constraint manifested as the subject-object asymmetry in (2), the nominative case particle should be dropped more frequently from direct objects than from subjects. Just as in non-stative transitive sentences, there should be an asymmetry between subjects and direct objects in deleting case particles.

For morphological case-marking, I am concerned with questions as to what case-marking errors children make, and whether they make errors as often as with canonical case-marking for transitive verbs. As described in detail in 2.3.2, a semantic notion of stativity has syntactic/morphological consequences manifested as case-marking patterns which differ from the canonical nominative-accusative. Some stative verbals may take the dative case as well as the nominative case for subjects and the nominative case for direct objects. As is the case in the previous experiments, if the children employ the nominative strategy (see 3.2.4 and 3.3.4.1), this could lead them to error-free performance.

On the other hand, Clancy (1985, p. 393) reports an error by a 3-year-old child who used an accusative *o* for the direct object of *mieru* 'be able to see'. This is an interesting case where the child tried to regularize the case-marking rule in light of the
canonical nominative-accusative pattern. This type of overregularization might be observed more frequently in an experimental situation than in natural settings.

4.1.1 Method

Subjects

Twenty-seven preschool children living in Japan participated in this experiment. The ages of the children ranged from 3;5 to 6;6 (mean age = 4;10). They were divided into two groups. The younger group consisted of twelve children (mean age = 3;10). There were five 3-year olds and seven 4-year olds in this group. The older group consisted of fifteen children (mean age = 5;3). There were ten 5-year olds and five 6-year olds in this group. All children had consistent exposure to Japanese from peers at kindergarten and from family members at home. Some children had participated in the previous experiment(s) reported in chapter 3, but those experiments were carried out about six months before the current experiment.

Materials and procedure

The stative verbals tested in this experiment are summarized in Table 4.1. The children's performance on these stative verbals was compared with their performance on non-stative transitive verbs (hereafter, transitive verbs).¹ As shown in the table, they were the non-causative verbs taking inanimate direct objects tested in Experiment 2. Among the

¹ In this chapter I will use the term "transitive verbs" to refer to non-stative transitive verbs solely for convenience.
four stative verbals, *wakaru* 'understand' and *mieru* 'be able to see' are compatible with both dative and nominative subjects. The other two, *suki* 'be fond of' and *kirai* 'dislike' are nominal adjectives, and they are compatible only with nominative subjects (e.g., Kuno, 1973b, pp. 90-91). All the stative verbals tested here can be used in reversible sentences. But, they were used with animate subjects and inanimate direct objects in this experiment. Both the stative verbals and the transitive verbs were used in the present tense.

Elicited production was adopted: both subjects and direct objects of stative verbals and transitive verbs were elicited from the children. There were four tokens for each type. The verbs were used twice: once for subject elicitation and once for direct object elicitation. Therefore, a total of 16 sentences were elicited from each child in random order.

There were three independent variables. They were grammatical relations with two levels (subject, direct object), verb types with two levels (stative, transitive), and age groups with two levels (younger, older). The effect of each variable and their interactions will be examined.
As in the case of the previous experiments, *wh*-questions were the target sentences. *Wh*-subject questions (*Dare-ga V?*) and *wh*-object questions (*Nani-ga V*) were elicited. Note again that two of the stative verbals (*wakaru 'understand' and *mieru 'be able to see'*) are also compatible with dative subjects. Thus, a *wh*-subject question for them could include *'Dare-ni V?'*, although there is no specific way to elicit these dative subjects. The details of the experimental procedure are described in 3.1, so only sample interactions for subject elicitation and for direct object elicitation are presented here.

**Sample interaction: for subject elicitation of the dyadic stative verbal *kirai 'dislike'*

1. Showing first the picture where a cow seems to dislike a carrot (Figure 4.1):

   E: Kore-wa dare kana?
      'Who's this?'
   C: Usi-san.
      'A cow.'
   E: Soo. Zya, kore-wa nani kana?
      'Right.' 'Then, what's this?'
   C: Ninzin.
      'A carrot.'
   E: Soo da ne.
      'Right.'
      Hora, mite. Kiraina-n da ne.
      'Look, this.' 'The cow) dislikes (a carrot).'

2. The next two pictures were shown (Figure 4.2). Referring to the left one depicting two animals:

   E: Kore, dare kana?
      'Who's this?'
   C: Inu.
      'A dog.'
   E: Soo ne. Zya, kore wa?
      'Right.' 'How about this?'
   C: Saru.
      'A monkey.'
E: Soo, yoku wakaru ne.  
'Sright, you know well.'

3. Referring to the right picture suggesting that the covered entity dislikes a carrot:

E: A, mite, hora, kirai da yo. (while pointing at the covered entity)  
'Hey, look, (X) dislikes (a carrot).'
E: Demo, kore mic-nai desyou. Dakara Zyazzi ni kiite-mite.
'But we don't see this.' 'So can you ask the Judge (who)?'
C: Zyazzi.
'The judge.'
Z: Un.
'Yes.'
C: Dare-ga kiraina no?
'Who dislikes (it),'#
Z: Eeto ne, wan-wan te naka-nai hoo da yo.
'Well, that's the one that doesn't bark "bow-wow".'
C: Saru!
'A monkey!'

Figure 4.1. The first picture used for the elicitation of a wh-subject of kirai 'dislike'.

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Figure 4.2. Second pictures used for the elicitation of a wh-subject of kirai 'dislike'.

Figure 4.3. The third picture showing the answer of the wh-subject of kirai 'dislike'.

4. The next picture was shown depicting the same event with the entity now uncovered (Figure 4.3).
E: Attari! Yoku wakatta ne.
   'Correct!' 'You're so great.'

Sample interaction: for direct object elicitation of the dyadic stative verbal mieru 'be able to see'

1. Showing first the picture where a cat is looking at the sea by using binoculars (Figure 4.4):

   E: Kore-wa dare kana?
      'Who's this?'
   C: Neko-san.
      'A cat.'
   E: Soo. Zya, kore-wa nan daroo.
      'Right.' 'Then, what's this?'
   C: Umi.
      'The sea.'
   E: Soo da ne.
      'That's right.'
      Hora, mite. Mieru-n dat-te.
      'Look, this.' '(The cat) is able to see (the sea).'</n
Figure 4.4. The first picture used for the elicitation of a wh-object of mieru 'be able to see'.
2. The next two pictures were shown (Figure 4.5). Referring to the left one depicting two scenes:

E: Kore, nani kana?
   'What's this?'
C: Oyama.
   'A mountain.'
E: Soo ne. Zya, kore wa?
   'Right.' 'How about this?'
C: Ki.
   'A tree.'
E: Soo, yoku wakaru ne.
   'Right, you know well.'

3. Referring to the right picture suggesting a cat is looking at a covered entity by using binoculars:

E: A, mite, hora mieru yo. (while pointing at the covered entity)
   'Hey, look, (the cat) is able to see (X).'
E: Demo, kore wakara-nai desyoo. Dakara Zyazzi ni kiite-mite.
   'But we don't see this.' 'So, can you ask the Judge (what)?'
C: Zyazzi.
   'The judge.'

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Z: Un.
   'Yes.'
C: Nani-ga mieru no?
   'What is (the cat) able to see?'
Z: Eeto ne, takai hoo da yo.
   'Well, that's higher one.'
C: Yama!
   'A mountain!'

4. The next picture was shown depicting the same event with the entity now uncovered. (Figure 4.6)

E: Attari! Yoku wakatta ne.
   'Correct!' 'You're so great.'

Figure 4.6. The third picture showing the answer of the wh-object of mieru 'be able to see'.
Stative events are rather ambiguous when presented in static pictures. As in the case of action events, therefore, the experimenter's verbal cue was crucial. For example, as shown in the sample interaction above, the stative verbal *mieru* 'be able to see' was given to the child verbally, while showing a picture in Figure 4.4.

In the pictures, animals such as a dog and a cat were used for animate entities who were engaged in human activities. To familiarize the children with the task, a brief practice session was held before the testing session. For practice, elicited sentences included *wh*-indirect objects (*doko-ni* for *noboru* 'climb' and *iku* 'go') and a *wh*-adjunct (*doko-de* for *asobu* 'play'), but sentences containing nominative and accusative case particles were not used in order to avoid carry-over effects. The experiment was carried out individually and took approximately 15 to 20 minutes per child. This experiment was conducted about 6 months after Experiment 1 and Experiment 2. Some children tested in the previous experiment also participated in the present experiment. But due to the long time span between the experiments, I will not compare those children's performance across the tasks.

4.1.2 Overall results

For scoring, all conversations were tape-recorded and the children's utterances were transcribed by the experimenter. The children's utterances were examined as to whether they were consistent with the target sentence. The scoring criterion adopted here is the same as the one for Experiment 1 and Experiment 2. That is, the target sentence must have the sentence structure shown in (5).

(5)  *Wh*-argument (+ case particle) + verbal
The target sentence could include two overt arguments, but no such sentence was produced by the children. This seems to reflect the fact that argument ellipsis is more natural than using two overt arguments in the given context. The wh-word could be either dare 'who' or nani 'what', but dore 'which' and dotti 'which' were also acceptable and the children also used the latter two. If a sentence involved a non-wh-argument, it was counted as a possible target sentence only when the argument was marked with a case particle. However, only two such sentences were produced by one child.

There were also sentences incompatible with the target for various reasons which are summarized in Appendix A. Those utterances were excluded from further analysis. Out of 432 tokens, 414 utterances were considered to exhibit the target form. This proportion reaches 95.8%, ranging from 91.7% for stative subjects to 98.1% for transitive subjects. A three-way repeated measures ANOVA was conducted to examine whether any main effect or interaction effect was significant for the children's production of the target form. The results indicate that no effect was significant (Appendix C).

The target sentences were first examined for case particle deletion: whether or not the wh-argument was marked with a case particle. Then, error types and frequency were analyzed with respect to morphological case-marking.

4.1.3 Case particle deletion

The results of the descriptive statistics for case particle deletion are shown in Table 4.2. The percentages indicate the drop rate for case particles out of the total number of target sentences. There is a tendency that case particles on direct objects are more likely
Table 4.2 Proportions of Case Particle Deletion for Stative Verbals and Transitive Verbs

<table>
<thead>
<tr>
<th></th>
<th>Stative</th>
<th></th>
<th>Transitive</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subject</td>
<td>Object</td>
<td>Subject</td>
<td>Object</td>
</tr>
<tr>
<td>Younger</td>
<td>11.1%</td>
<td>13.2%</td>
<td>19.4%</td>
<td>54.2%</td>
</tr>
<tr>
<td>Older</td>
<td>6.7%</td>
<td>28.3%</td>
<td>18.9%</td>
<td>46.7%</td>
</tr>
<tr>
<td>Mean</td>
<td>8.6%</td>
<td>21.6%</td>
<td>19.1%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>

to be dropped than those on subjects. The deletion rate for objects of transitive verbs (50.0%) was remarkable.²

A three-way repeated measures ANOVA was performed to examine the effect of each independent variable and their interactions. The results are summarized in Table 4.3. A main effect of grammatical relations was significant, reflecting the fact that the children dropped case particles on direct objects more frequently than those on subjects. This is visually shown in Figure 4.7. Also, a main effect of verb type was significant. This is because the children dropped case particles for transitive verbs more frequently than those for stative verbals. As is shown in Figure 4.8, case particles for transitive verbs were dropped about twice as often as those for stative verbals.

² The transitive verbs tested in this experiment were identical to Type 4 verbs (non-causative, inanimate-object) in Experiment 2. Even in the previous experiment, case particle deletion was the most frequent on the direct objects of these verbs (26.9%). Even so, there still seems to be a great gap in the results between the two experiments, for which I have no good explanation.
Table 4.3 ANOVA Table for Case Particle Deletion for Stative Verbals and Transitive Verbs

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Subjects Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age groups (AG)</td>
<td>.001</td>
<td>1</td>
<td>.001</td>
<td>.004</td>
<td>.951</td>
</tr>
<tr>
<td>Error</td>
<td>7.540</td>
<td>25</td>
<td>.302</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grammatical relations (GR)</td>
<td>1.240</td>
<td>1</td>
<td>1.240</td>
<td>20.620</td>
<td>.000</td>
</tr>
<tr>
<td>GR * AG</td>
<td>.027</td>
<td>1</td>
<td>.027</td>
<td>.443</td>
<td>.512</td>
</tr>
<tr>
<td>Error(GR)</td>
<td>1.503</td>
<td>25</td>
<td>.060</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb semantics (VS)</td>
<td>1.063</td>
<td>1</td>
<td>1.063</td>
<td>24.919</td>
<td>.000</td>
</tr>
<tr>
<td>VS * AG</td>
<td>.059</td>
<td>1</td>
<td>.059</td>
<td>1.374</td>
<td>.252</td>
</tr>
<tr>
<td>Error(VS)</td>
<td>1.066</td>
<td>25</td>
<td>.043</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GR * VS</td>
<td>.250</td>
<td>1</td>
<td>.250</td>
<td>7.769</td>
<td>.010</td>
</tr>
<tr>
<td>GR * VS * AG</td>
<td>.117</td>
<td>1</td>
<td>.117</td>
<td>3.641</td>
<td>.068</td>
</tr>
<tr>
<td>Error(GR * VS)</td>
<td>.805</td>
<td>25</td>
<td>.032</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.7 Case particle deletion in terms of grammatical relations.
Figure 4.8 Case particle deletion in terms of verb types.

Figure 4.9. Case particle deletion in terms of grammatical relations and verb semantics.
There was a significant two-way interaction between grammatical relations and verb types. As shown in Figure 4.9, the children dropped case particles for direct objects more frequently than for subjects for both types of verbs, while the difference in deletion rate of particles between subjects and direct objects was greater for transitive verbs than for stative verbals. In other words, the subject-object asymmetry of case particle deletion was observed to be more remarkable for transitive verbs than for stative verbals.

What do these results tell us about the functional hypothesis (3), repeated as (6)?

(6) Functional hypothesis: Children tend to retain a nominative case particle so that its semantic functions can be fulfilled.

If a nominative case particle tends to be retained due to its semantic functions, there should be no asymmetry between subject and object case drop for stative verbal constructions, because both subjects and direct objects are marked with nominative *ga*. The existence of an asymmetry suggests that there is a factor other than the semantic functional properties of *ga*. But, an interaction effect between grammatical relations and verb types complicates the picture: it basically says that the children's case particle deletion was sensitive to grammatical relations in stative verbal constructions but it was not as sensitive as to grammatical relations for transitive verbs.\(^3\)

\(^3\) For the purpose of examining the single effect of grammatical relations (subject, direct object) on case particle deletion in stative verbal constructions, a paired *t*-test (two-tailed) was performed on the children's performance on stative verbal constructions. Since there was no main effect of age groups or interaction effect involving age groups, the group variable was collapsed. The results indicate that the mean for object-marker drop was significantly higher than for subject-marker drop, *t*(26) = 2.762*, *p* = .010. This
The question is why the asymmetry for transitive verbs is greater than for stative verbals. Here, the functional hypothesis seems to have a role in explaining the results. That is, the children may have retained the nominative ga for its semantic functions (i.e., exhaustive listing or focus). Since the nominative case particle is used to mark both subjects and direct objects of stative verbals, the overall retention of ga makes the subject-object asymmetry small, as compared with the asymmetry in transitive verbs. Therefore, the functional hypothesis may not be totally irrelevant here, but this hypothesis alone cannot account for the subject-object asymmetry.

From an opposite point of view, the results suggest that the syntactic constraint is observed in children's performance for both stative verbals and transitive verbs. But because the constraint account alone does not explain the difference between the two types of verbs, the semantic functions of ga must play a role in the explanation for why the subject-object asymmetry is greater for nominative-accusative (i.e., transitive) than for nominative-nominative (i.e., stative verbals).

I have assumed that the deleted case particle in stative verbal constructions is the nominative case particle. But, in fact there is no way to identify what the deleted particles were, and this would be problematic if children's case-marking for stative verbal constructions involved the accusative case particle. That is, if the children had assumed an accusative case particle for a direct object and they had dropped it, what was being tested might simply be the nominative-accusative asymmetry. Although it is impossible to reject

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...can not be accounted for by the functional hypothesis alone, which in turn suggests the involvement of a syntactic constraint manifested as a subject-object asymmetry.

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this possibility, there is indirect evidence that the deleted particle was the nominative \textit{ga}. This comes from the children's production of morphological case particles. When they used a case particle for the direct object of a stative verbal, they were almost always the nominative case particle. As I will mention in the following section, a few accusative case particles were observed in the children's productions; however, they were produced only four times by two children. So, this may be considered a minor factor for case particle deletion.

Lastly, in this section, I would like to discuss the effect of age. As shown in Table 4.3, a main effect of age groups and interactions involving age groups were not statistically significant. However, the results of the descriptive statistics exhibit an interesting tendency. Figure 4.10 indicates that as age increased, the rate of object-marker drop decreased for transitive verbs. (This tendency was also observed in Experiment 2). But this tendency was not observed for dyadic stative verbals. I believe that the increasing use of case particles simply reflects the children's implementation of case particles in general in the course of language development. Then, how can the decrease in use of the object-marker with stative verbals be accounted for? This might be because the syntactic constraint, even if it does operate, might not necessarily be observable in the children's linguistic performance if there is a robust opposing (non-syntactic) factor. This might be a functional one (i.e., the functional hypothesis), if children at younger ages are very sensitive to focus and related notions.
4.1.4 Morphological case-marking

For morphological case-marking, Table 4.4 summarizes the results of the descriptive statistics. As in the case of Experiment 2, the children made overextension errors for case-marking of transitive verbs. All errors on subject-marking involved overextension of the accusative case particle. On the other hand, all errors involving object case-marking involved overextension of the nominative case particle, except for one that was the misuse of dative *ni*.\(^4\) Since these errors for transitive verbs were extensively discussed in 3.3.4, I will focus on the stative verbal constructions in this section.

\(^4\) This was made on a direct object of *motu* 'hold' by a child aged 4;0.
Table 4.4 Proportions of Morphological Case-marking Errors for Stative Verbals and Transitive Verbs

<table>
<thead>
<tr>
<th></th>
<th>Stative</th>
<th></th>
<th>Transitive</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subject</td>
<td>Object</td>
<td>Subject</td>
<td>Object</td>
</tr>
<tr>
<td>Younger</td>
<td>0</td>
<td>0</td>
<td>4.2%</td>
<td>35.4%</td>
</tr>
<tr>
<td>Older</td>
<td>0</td>
<td>6.7%</td>
<td>0</td>
<td>6.7%</td>
</tr>
<tr>
<td>Mean</td>
<td>0</td>
<td>3.7%</td>
<td>1.9%</td>
<td>19.4%</td>
</tr>
</tbody>
</table>

For stative verbals, no child made an error on subjects. Two verbs tested here (wakaru 'understand' and mieru 'be able to see') are compatible with dative subjects, but no child used the dative case for them. For the direct objects of stative verbals, there were four cases where the accusative case was used by two children. SK (5;3) used accusative o for wakaru 'understand' and suki 'be fond of', and YY (5;9) for wakaru 'understand' and mieru 'be able to see'.

The accusative case particle used on the direct object of a stative verbal cannot be called an error. As Shibatani (1990) points out, many speakers allow this ga/o alternation for certain stative predicates such as suki 'be fond of' and hosii 'want', "despite a strong feeling on the part of native speakers that the ga version is a 'correct' form" (p. 301). As Clancy (1985) observes, however, children's use of an accusative case particle on the direct object of a stative verbal seems to be the result of regularization. That is, the children make a generalization for morphological case-marking on the basis of the

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5 Shibatani (1990) also suggests that this ga/o alternation is a piece of evidence that the second NP in a stative verbal construction is a direct object.
canonical case-marking pattern. And then, they correct those incompatible with this canonical pattern, resulting in the overregularization.

The children's age may have some relevance. Notice that the two children who used an accusative case particle were from the older group. Both of them were 5-year-olds, and no younger children used accusative case. This seems to reflect the fact that overregularization happens only after the children make a significant generalization about the case-marking system. If they do not have any generalization about the case-marking or if they have not learned the canonical case-marking pattern, they would have no basis from which to regularize the non-canonical pattern. This in turn suggests that children might learn the nominative-accusative case-marking pattern for transitive verbs before they learn the double nominative pattern for stative verbals.

It is quite natural that the nominative-accusative pattern is learned first, because it is canonical in the sense that the pattern is linguistically unmarked and it is also predominant in Japanese. But, if so, why did children make many errors on the canonical case-marking pattern as compared with the more marked double nominative pattern for stative verbals? As shown in Figure 4.11, the results of the present experiment show the seeming earlier acquisition of the double nominative pattern than the canonical one. As mentioned above, only four errors were observed for stative verbal constructions. However, I believe that this almost error-free performance is not necessarily due to the children’s knowledge of the double nominative case-marking per se, but it may be due to application of the nominative strategy. This strategy of using the nominative case particle on an overt argument in a sentence, observed in both Experiment 1 and Experiment 2 (see
Figure 4.1: Errors on morphological case-marking for stative verbals and transitive verbs

3.2.4 and 3.3.4), may operate here as well. However, as the strategy leads to correct case-marking, it is indistinguishable from correct use of *ga*. Thus, the data obtained, unfortunately, tell us little about the comparison of the two case-marking patterns in acquisition.\(^5\)

\(^5\) It is possible that children exhibit U-shaped behavior for the acquisition of the double nominative case-marking. First, they start correctly using the nominative case particle on the direct object but for a wrong reason. They simply use *ga* as a strategy. Then, they realize that direct objects are most typically marked with the accusative case particle and they learn the canonical case-marking pattern. At this point, however, their performance could involve overregularization: they might use accusative case on any object based on the learned pattern. Finally, they learn that stative verbals require nominative case while others take accusative case, and they implement double nominative case-marking as well.
4.1.5 Summary of Experiment 3

In this section, I will summarize the main findings of Experiment 3 and the explanation and hypotheses for the results.

Main findings: case particle deletion
1. The children dropped case particles for direct objects more frequently than for subjects.
2. The children dropped case particles for transitive verbs more frequently than for stative verbals.
3. The difference in the deletion rate of case particles between subjects and direct objects was greater for transitive verbs than for stative verbals.
4. Only for stative verbals, there is an increasing tendency of object-marker drop, as age increases.

Explanation and hypotheses: case particle deletion
a. Syntactic constraint: The children's performance is compatible with subject-object asymmetry: A case particle on a direct object NP may be deleted, while that on a subject NP may not.

b. Semantic functions of *ga*: The functional hypothesis (that children tend to retain a nominative case particle so that its semantic functions can be fulfilled) is not supported as an explanation of subject-object asymmetry in general, but it may have a
role to play in accounting for the greater asymmetry observed in nominative-accusative case-marking.

Main findings: morphological case-marking (only for stative verbals)

5. Case-marking errors for stative verbals were infrequent.

6. A few children in the older group used accusative case on the direct objects of stative verbals, which may be regarded as a result of overregularization.

Explanation and hypotheses: morphological case-marking

c. Strategy hypothesis: Potential errors on the direct objects of stative verbals may be hidden by the nominative strategy.

4.2 Experiment 4: Morphological bootstrapping

I assume that the target grammar associates the stativity component of verb meanings ([±stative]) with case-marking patterns, since double nominative (or dative-nominative) case-marking appears exclusively with stative verbals and nominative-accusative case-marking with non-stative transitive verbs. For clarification, the following scheme may help.

(7) Subject-ga Object-o Verb [−stative]

Subject-ga/-ni Object-ga Verb [+stative]

A fundamental question has been whether children know these patterns. In the previous experiments, I investigated children's production of morphological case for verbs. The
current experiment takes the reverse approach, where the question is asked whether children are able to infer a verb is stative from case-marking patterns. I will call the morphological cueing of case-marking for the verb meanings "morphological bootstrapping".

Confusion due to terminology must be avoided, however. A bootstrapping problem in the acquisition literature is a problem as to how learning language starts: the way to break into the system (e.g., learning verb meanings) at the very outset of language acquisition (e.g., Grimshaw, 1981; Pinker, 1984, 1989, 1994). The usage of "bootstrapping" here is somewhat analogous to Gleitman's (1990) syntactic bootstrapping hypothesis, claiming that children can infer verb meaning from syntactic subcategorization.

Despite some evidence for syntactic bootstrapping in the acquisition data for English (e.g., Naigles, 1990), I believe that there is a reason why morphological (or syntactic) bootstrapping may not operate at the initial stage of verb learning in Japanese. This is because, due to extensive ellipsis, Japanese-speaking children rarely have the chance to hear the full frame of syntactic structures such as those represented in (7). Actual caregiver utterances to a child are more likely to have the following frames:

(8) NP-ga Verb
    NP-o  Verb

These one-overt-argument sentences may be the result of ellipsis of a subject or a direct object, but there is in fact no way to know what the full sentence structure should be unless we know the verb in advance. To make matters worse, case particles are often
unavailable as well. In the morphosyntactic frames provided to children, therefore, there seems to be little information with which children may start learning verb meanings.

These language-particular circumstances have led me to the prediction that morphological bootstrapping may not occur at least in the beginning of language acquisition in Japanese. However, language learners eventually come to know the schema in (7). So, once children are able to generalize the association between case-marking patterns and verb meanings, it should be possible for them to infer meanings of new verbs just from their morphosyntactic frames. At this point, bootstrapping may take place.

My research questions investigate when children are able to make use of morphological case-marking to infer whether a verb is stative. A second question is concerned with a comparison of two case-marking patterns for morphological bootstrapping. The results of Experiment 3 exhibited what looks like nearly error-free performance for double nominative case-marking. In contrast, we observed in Experiments 2 and 3 that the children made many errors for the canonical nominative-accusative case-marking pattern. If this contrast truly reflects children's knowledge of these two case-marking patterns, we would expect to find that children perform better on double nominative case-marking than on canonical case-marking in this experiment. Making use of novel verbs, Experiment 4 examines children's performance on these two case-marking patterns.
4.2.1 Method

Subjects

Fifty-seven children living in Japan participated in this experiment. The ages of the children ranged from 3;0 to 7;3 (mean age = 5;4). They were divided into three age groups: Group I consisted of nineteen 3- and 4-year olds (mean age = 3;9), Group II of nineteen 5- and 6-year old preschool children (mean age = 5;7), and Group III of nineteen 6- and 7-year old first graders (mean age = 6;9). They were all native speakers of Japanese.

Materials and procedure

A picture selection task was adopted. First, the child was told to play a game, and a cat toy called Neko-san was introduced. Then, the experimenter explained that the cat toy would tell the child a very short story about a girl named Hanako-tyan, and that the story was depicted in one of the pictures shown to the child. When the cat toy gave the child a story (i.e., a test sentence), two pictures were shown. Each picture was drawn on 8 ½ x 11 inch paper and put into a transparent sheet in a binder. The child's task was to point at the picture that matched what the Neko-san said. For example, the following sentence was given with the two pictures shown in Figure 4.12.

7 In the Japanese school system, children are usually classified into age groups on the basis of their age on April 1, the beginning of the school year in Japan. Although there were 6-year olds both in Group II and Group III, those in Group II were in preschools while those in Group III were in the first year of a primary school at the time of the experiment.
(9) Hanako-tyan-ga hasiru yo.
Hanako-miss-Nom run pcl
'Hanako runs.'

Given sentence (9), the child is expected to point at the left picture where the girl is running.

![Figure 4.12. Pictures used for sentence (9).](image-url)

After the child had worked on practice sentences such as (9) for the purpose of familiarization with the task, the experimenter added a further instruction as follows.


'Neko-san is not good at speaking human language. So she may sometimes use cat’s words. But don’t worry! If she uses cat’s words, try to guess what she means. I bet you’ll understand.'
This was given for establishing a situation in which the child would be dealing with novel verbs. After the instruction in (10) was provided, the experimenter started testing novel verbs as well. A novel verb was given in one of the two case-marking patterns in (11).

    Hanako-miss-Nom snake-Acc verb pcl

    b. Hanako-tyan-ga hebi-ga noteru yo. 
    Hanako-miss-Nom snake-Nom verb pcl

The sentence in (11a) has canonical nominative-accusative case-marking while that in (11b) has double nominative case-marking. The former is likely to be associated with a non-stative meaning; therefore, the picture corresponding to it is more likely to be the one on the left in Figure 4.13, where the girl Hanako-tyan is hitting a snake with a stick. On the other hand, the sentence in (11b) must be associated with a stative meaning whose corresponding picture is more likely to be the one on the right in Figure 4.13, where the girl Hanako-tyan and the snake have no physical contact and no action is depicted. Note that a dative-nominative pattern was not included because not all stative verbals allow this case-marking pattern (see 2.1).
The verb morphology was controlled for transitivity. There are so-called paired verbs in Japanese, where a transitive-intransitive distinction is made by semi-productive verb morphology with the same roots. For example, both *nig-e-ru* 'escape' and *sim-ar-u* 'shut' are intransitive verbs, and their transitive counterparts are *nig-as-u* 'let escape' and *sim-e-ru* 'shut', respectively. As can be seen in these examples, -e- is often used to indicate both intransitive and transitive in such verb pairs (for a list of paired verbs, see Jacobsen, 1992, pp. 258-269). In order to minimize any cues of verb morphology with regard to transitivity, all novel verbs included the -e- morpheme as in (12).

(12)  hiheru,  yoneru,  suheru,  noteru,  kemeru,
      rakeru,  temeru,  naneru,  muteru,  sokeru

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These 10 novel verbs were used in the present tense either with nominative-accusative case-marking or double nominative case-marking. The verbs were randomly assigned to one of the case-marking patterns. The sets of pictures were used twice: once for the nominative-accusative pattern and once for the double nominative pattern. The events depicted in the sets of pictures are described in Table 4.5. The order of the test sentences was randomized. A total of 24 sentences were tested in the experiment, among which 10 sentences were relevant for the present purpose: 5 for nominative-accusative and 5 for the double nominative case-marking. The other sentences were fillers for this experiment and they involved existing verbs. The experiment was carried out individually and took approximately 5 minutes per child.

Table 4.5 Events Stimuli for Novel Verbs

<table>
<thead>
<tr>
<th>Non-stative action event</th>
<th>Stative event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A girl is tearing a book by hand.</td>
<td>A girl is looking at a book which is a little away from her.</td>
</tr>
<tr>
<td>2 A girl is throwing an alarm clock away.</td>
<td>A girl recognizes the sound of an alarm clock which is a little away from her.</td>
</tr>
<tr>
<td>3 A girl is hitting a snake with a stick.</td>
<td>A girl is shuddering, with a snake being close to her.</td>
</tr>
<tr>
<td>4 A girl is eating a cake by hand.</td>
<td>A girl is looking at a cake near her, with her mouth watering.</td>
</tr>
<tr>
<td>5 A girl is climbing up a mountain.</td>
<td>A girl is looking at a mountain over there.</td>
</tr>
</tbody>
</table>

The rationale here is that if the children can associate case-marking patterns with the event types depicted in the pictures, we should observe matched patterns—the
nominative-accusative case-marking pattern with a non-stative event, and the double
nominative pattern with a stative event—in the children’s responses. If, on the other hand,
the children randomly associate case-marking patterns with event types, the chance for
matching patterns would be about 50%. If the children associate a particular novel verb
with a particular event—either stative or non-stative—the first time they see a set of
pictures, and then associate another novel verb with the other event in the same set of
pictures, the results should either both be matched or both be non-matched. Overall, this
gives a 50% chance of matching. Also, if this is the case, there should be no difference in
the rate of matching/non-matching between the two case-marking patterns, since the initial
association between the verb form and the event type is random.

It might be objected that I should not have used novel verbs for events which
could be expressed by existing verbs in Japanese. That is, the children might in fact assume
the existing verbs, and adopt their case-marking patterns for selecting pictures. In this
case, however, what is tested would be the children’s knowledge of the existing verbs, but
even in this case they should know whether the verb should be matched with an existing
stative verb or an existing non-stative verb, and case-marking knowledge is required for
this selection.

The null hypothesis is that the children randomly assign case-marking patterns to
event types; therefore, matching patterns would be at about chance and there should be no
difference in the matching rate between the two case-marking patterns.
4.2.2 Results

The results are shown in Table 4.6, where the matched cases are counted as scores. The scores by group are totaled in the rightmost column, and the scores by type mean are in the bottom cells. What is noticeable in the table is the overall low scores. In order to examine whether the children's performance is random, one-sample t-tests were performed on the overall scores from each group.\(^8\) As indicated by the descriptive statistics, the children in Group I performed at chance level, whereas children in Group II and Group III matched the case-marking patterns with event types significantly above chance (Group II: \(t(18) = 3.376^*, p = .003\); Group III: \(t(18) = 6.344^*, p = .000\)). These results are taken to indicate that the children's performance was not random in Groups II and III.

<table>
<thead>
<tr>
<th></th>
<th>Nominative-nominate</th>
<th>Nominative-accusative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>2.84 (.96)</td>
<td>2.16 (1.12)</td>
<td>5.00 (1.60)</td>
</tr>
<tr>
<td></td>
<td>56.8%</td>
<td>43.2%</td>
<td>50.0%</td>
</tr>
<tr>
<td>Group II</td>
<td>2.79 (1.08)</td>
<td>3.21 (1.03)</td>
<td>6.00 (1.29)</td>
</tr>
<tr>
<td></td>
<td>55.8%</td>
<td>64.2%</td>
<td>60.0%</td>
</tr>
<tr>
<td>Group III</td>
<td>3.47 (1.02)</td>
<td>3.21 (.92)</td>
<td>6.68 (1.16)</td>
</tr>
<tr>
<td></td>
<td>69.5%</td>
<td>64.2%</td>
<td>66.8%</td>
</tr>
<tr>
<td>Mean</td>
<td>3.04 (1.05)</td>
<td>2.86 (1.13)</td>
<td>5.89 (1.51)</td>
</tr>
<tr>
<td></td>
<td>60.7%</td>
<td>57.2%</td>
<td>58.9%</td>
</tr>
</tbody>
</table>

* Standard deviations are shown in parentheses.

\(^8\) Test value was set at 5, half the total number of stimulus sentences (i.e., 5/10 = 50%). The \(t\)-tests were all two-tailed.
Looking at the scores for each case-marking pattern, we see higher scores for canonical case-marking than for the double nominative in Group II, but this was reversed in Group III. A two-way repeated measures ANOVA was performed on the scores of these two groups. The two independent variables were case-marking with two levels (nominative-accusative, double nominative) and age groups with two levels (Group II, Group III). Since the performance by the children in Group I was found to be random, they were not included in this analysis.

The results show no effect of case-marking and age groups, as Table 4.7 shows. An interaction effect of case-marking and age groups was also found not to be significant.

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age groups (AG)</td>
<td>2.224</td>
<td>1</td>
<td>2.224</td>
<td>2.959</td>
<td>.094</td>
</tr>
<tr>
<td>Error</td>
<td>27.053</td>
<td>36</td>
<td>.751</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Subjects Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case-marking (CM)</td>
<td>.118</td>
<td>1</td>
<td>.118</td>
<td>.090</td>
<td>.765</td>
</tr>
<tr>
<td>CM * AG</td>
<td>2.224</td>
<td>1</td>
<td>2.224</td>
<td>1.698</td>
<td>.201</td>
</tr>
<tr>
<td>Error(CM)</td>
<td>47.158</td>
<td>36</td>
<td>1.310</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.2.3 Discussion

I have addressed two research questions. The first one asks when children are able to make use of case-marking morphology for inferring stativity. The results seem to suggest that this does not happen to children at younger preschool years like age 3 or 4.
(i.e., Group I). They seem to start making use of the knowledge of case-marking around the age 5 or 6 (i.e., Group II) but even school-aged children (i.e., Group III) are far from perfect for using case-marking morphology to infer the verb meanings. These results are compatible with children's production errors on case particles observed in Experiment 2, where the canonical nominative-accusative pattern was investigated. Preschool children made many case-marking errors and their knowledge of morphological case-marking is likely to be unstable at younger ages. For this reason, they may not use case-marking particles for learning about new verbs.

It must be stated, however, that morphological bootstrapping and simply producing appropriate case particles are different. Children younger than age 3 may produce case particles, even though their use of case particles often involves errors. Children start to recognize that Japanese arguments often require case particles and the learning of case particles may take place as soon as they recognize this linguistic fact. But this may proceed without referring to case-marking patterns or frames such as those represented in (7) repeated here as (13).

(13) Subject-ga Object-o Verb [-stative]

    Subject-ga/-ni Object-ga Verb [+stative]

These are frames or constructions in which all constituents are overtly expressed including case particles for both the subject and the direct object. If no direct object is expressed, however, it is impossible to guess what kind of verbs might be used with an overtly expressed subject. However, in parental input, sentences containing both subjects and direct objects are likely to be rare (see 5.3.2), so Japanese-speaking children may have few
opportunities to learn the case-marking systems as frames or constructions. As I mentioned before, this is the reason why I believe that morphological bootstrapping may not occur at the outset of language acquisition in Japanese, and this observation seems to be confirmed by the experimental results. Moreover, the elliptical feature of Japanese seems to imply that bootstrapping from morphology and/or syntax may not be helpful for learning Japanese verbs.

However, there is some evidence that syntactic bootstrapping (Gleitman, 1990) takes place in learning English as a first language (see, for experimental evidence, Naigles, 1990). Also, a similar process for acquisition is proposed as an application of Goldberg’s (1995) Construction Grammar. Tomasello (1998) and Tomasello and Brooks (to appear) consider the possibility that what children initially learn are constructions—syntactic skeletons—used to make generalizations about the rules of the language being learned. However, a solution for learning highly elliptical languages such as Japanese remains to be discussed.

The other research question is concerned with the comparison of the two case-marking patterns. Although the mean differences in scores between the two case-marking patterns was not significant by inferential statistics, there is a tendency for canonical case-marking to be better than the double nominative in Group II. As age increased, on the

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9 From a little different perspective, Rispoli (1987, 1995) made a similar observation.

10 By morphological bootstrapping, here I refer to learning [stative] verb meanings from case-marking morphology. But case-marking is not the only one morphological cue available to children. For example, verb morphology such as tense and aspect markers may act as cues for learning about Japanese verbs.
other hand, the mean difference disappeared in Group III due to the increasing scores for double nominative case-marking, as visually shown in Figure 4.14. This suggests that children might learn to use the canonical case-marking pattern before the double nominative pattern for inferring the verb meanings, since the children in Group II were better at the former than the latter. Nonetheless, taking the results of inferential statistics, I temporarily conclude that the order of acquisition for the two case-marking patterns is inconclusive.

![Figure 4.14. Matched responses for two case-marking patterns.](image)

A point of concern here is the overall low scores. Although the performance by the children in Groups II and III was significantly better than chance, their scores were still low: they stayed within a range between 55% and 70%. This may reflect a difficulty in
morphological bootstrapping as I suggested above. That is, for the children, making inferences about the [+stative] contrast from case-marking patterns may be more difficult than simply producing appropriate case particles for subjects and direct objects. In other words, the ability to mark case by case particles may not necessarily enable the children to use them for inferring verb meanings, implying that this is not the usual way of learning Japanese verbs.

Another cause for the low scores may be the children's lack of attention to case particles in the task. This may be because the children simply did not care about the case particles in the test sentences or their attention was more on the novelty of the verbs, which shifted their attention away from case particles. In either case, if the children's inattention resulted in these overall low scores, their scores might increase in contexts where their attention is more focused on case particles. In order to address this problem, William O'Grady (personal communication) has suggested that a combination of an imitation task and picture selection may work. That is, in order to increase the child's attention to case particles, the experimenter asks the child to repeat the test sentence before he/she selects a picture.

Also, William O'Grady (personal communication) made an intriguing proposal that the dative-nominative case-marking may improve children's scores for stative verbals. Since not all dative subjects are compatible with existing stative verbals, I adopted double nominative case-marking in this experiment. However, children might be more concerned with case particles on subjects than those on direct objects due to case particle deletion: case particles on direct objects are more likely to be dropped than those on subjects. If this
is true, what acts as a cue for stative verbals might be a dative-subject, because
nominative-subject is used for both non-stative transitive verbs and stative verbals.

4.2.4 Summary of Experiment 4

This section lists the main findings of Experiment 4 and their implications.

Main findings

1. Overall scores for matching case-marking patterns with corresponding verb meanings
   were low.

2. Morphological bootstrapping is not available to children at younger preschool years
   (e.g., age 3 and 4), and even though they seem to start using the knowledge of case-
   marking around the age 5 or 6, their performance was far from perfect.

3. There is a tendency for older preschool children to use the canonical case-marking
   pattern better than the double nominative for inferring [±stative] verb meanings.

Implications

a. Bootstrapping from case particles does not seem to be the primary way of learning the
   stative component of verb meanings.

b. The children's inattention to case particles may have led to the overall low scores.
CHAPTER 5
LEARNING AND INPUT

So far, I have investigated children's grammar in light of the target grammar. Based on the assumption that the target grammar represents adult linguistic knowledge, I have investigated whether children's grammar is consistent with the target grammar and what caused errors when the children's performance was not compatible with the target. However, these explorations have not addressed the question of how language acquisition takes place.

In this chapter, I will be concerned with language learning mechanisms. I will start with a comparison of the two aspects—case particle deletion and morphological case-marking—in the language acquisition data I have obtained from the experiments. Then, based on O'Grady's (1999b) classification of two types of phenomena in language and language acquisition, I will argue that the acquisition of these two aspects of Japanese case may be attributed to different learning systems. In doing so, I also consider the role and effects of parental input for each aspect of Japanese case by reexamining existing input studies.

5.1 Comparison of the two aspects in acquisition

A comparison of case particle deletion and morphological case-marking in the children's grammar exhibits some interesting contrasts. One of the most striking differences observed in the experiments is the effect of age. For case particle deletion,
even the younger children tended to follow the constraint manifested in the target grammar. The timing of the acquisition is quite early. Probably, by age 3 or so, children can demonstrate the knowledge of case particle deletion. On the other hand, since even older children made many errors on morphological case-marking, I suggest that the acquisition of case particles may continue until school age. The seemingly more abstract aspect of the omissibility of case particles is basically error-free, whereas the more concrete morphological phenomenon of case-marking appears to be more difficult and needs more time for learning.

Statistical results for Experiment 2 revealed that the children's errors on morphological case-marking were rooted in multiple factors such as verb semantics and argument-animacy. In order to account for them, I have suggested a number of plausible accounts and hypotheses. In contrast, case particle deletion was found to be quite independent in the sense that it was not affected by any of the factors that influenced the children's performance on morphological case-marking. Thus, as summarized in Table 5.1, these two aspects of Japanese case seem to spring from different grounds and follow different paths in the child's grammar, which suggests that the learning processes involved for each phenomenon may be quite different.

O'Grady (1999b) proposes that "language acquisition--and language itself--[must] consist of two separate and very different phenomena, each with its own etiology (cause) and ontogeny (developmental profile)". The two aspects of Japanese case under consideration seem to be compatible with his classification of the two types of phenomena summarized in Table 5.2.
Table 5.1 A Summary of Characteristics of Case Particle Deletion and Morphological Case-marking

<table>
<thead>
<tr>
<th></th>
<th>Case particle deletion</th>
<th>Morphological case-marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of acquisition</td>
<td>By age 3 or so, children realize that the omissibility of case particles reflects a subject-object asymmetry.</td>
<td>During preschool years, children learn case particles gradually and the learning continues until school age.</td>
</tr>
<tr>
<td>Errors</td>
<td>Basically, children follow the syntactic constraint as to a subject-object asymmetry.</td>
<td>Children make lots of errors (at least in the experimental settings).</td>
</tr>
<tr>
<td>Factors of errors</td>
<td>N/A</td>
<td>Multiple factors (semantics of causality, argument-animacy).</td>
</tr>
<tr>
<td>Strategy</td>
<td>No strategy is involved.</td>
<td>Children are likely to follow a certain case-marking strategy at least at younger ages.</td>
</tr>
</tbody>
</table>

Table 5.2 Two Types of Phenomena in Language and Language Acquisition (from O'Grady, 1999b)

<table>
<thead>
<tr>
<th>Type A</th>
<th>Type B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex, Difficult, and Intricate; their analysis is subject to controversy and uncertainty</td>
<td>Relatively Transparent and Easy; their analysis is relatively straightforward and uncontroversial</td>
</tr>
<tr>
<td>Little cross-linguistic variation</td>
<td>A lot of cross-linguistic variation</td>
</tr>
<tr>
<td>Acquired early and quickly; no systematic errors</td>
<td>Acquired over an extended period of time; frequent errors</td>
</tr>
</tbody>
</table>

Type A is basically a "core" type of syntactic phenomena in theories of language representations and language acquisition. For example, O'Grady suggests that constraints on the interpretation of pronouns and on extraction fall into this type, and that they are the

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product of an inborn computational system. Type B, according to O'Grady, involves past tense marking and the forms of pronouns (e.g., him vs. he) in English, and these are a product of learning that is sensitive to input and feedback.

One of O'Grady's purposes is to make clear our objects of study so that unnecessary confusion and disagreement over the nature of language acquisition (e.g., nativists vs. inductivists) may dissolve. An important facet of this classification is taking account the developmental facts—child language acquisition data—as well as the nature of language representations.

This classification seems to be applicable to the two aspects of Japanese case: case particle deletion falls into Type A and morphological case-marking into Type B. If so, case particle deletion stems from an inborn computational cognitive system, whereas morphological case-marking is rooted in the general learning processes. In the following sections, I will discuss in this line how the acquisition of these two aspects of Japanese case might take place.

5.2 Case particle deletion

5.2.1 Principle-based approach

Most studies on case particle deletion in Japanese take their perspective from the Principles and Parameters approach and Government and Binding (GB) theory, which is primarily a computational approach to how human mind works.1 Its application to

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1 In the recent development of this framework (Chomsky, 1995) computational operations have further been put forward.
acquisition studies investigates whether a certain linguistic principle innately specified by
Universal Grammar (UG) is available (see, for example, Crain & Thornton, 1998;

A UG-based approach focuses on linguistic principles which constrain a number of
syntactic phenomena in different languages, rather than on individual rules for particular
phenomena. For example, by examining case particle deletion, Kanno (1996) investigates
the availability of the Empty Category Principle (ECP) in second language acquisition. The
ECP is a UG principle, which licenses the empty category. According to Fukuda (1993), a
null case particle is an empty category; therefore, case particle deletion must follow the
ECP which requires the deleted case particle to be properly governed. These conditions
are fulfilled by a number of computational operations with technical notions defined within
this framework.²

_____________________________________
² Some of the basic notions and definitions required for the ECP are presented in the following. For a full
discussion, see, for example, Chomsky (1981, 1986a, 1986b) and Lasnik and Saito (1984).
The Empty Category Principle: Traces must be properly governed.

Proper Government: \( \alpha \) properly governs \( \beta \) iff \( \alpha \) theta-governs \( \beta \) or \( \alpha \) antecedent-governs \( \beta \).

\( \alpha \) theta-governs \( \beta \) iff \( \alpha \) is a zero-level category that theta marks \( \beta \), and \( \alpha \), \( \beta \) are sisters.

\( \alpha \) antecedent-governs \( \beta \) iff \( \alpha \) governs \( \beta \) and is co-indexed with it.

\( \alpha \) governs \( \beta \) iff \( \alpha \) c-commands \( \beta \) and every barrier for \( \beta \) dominates \( \alpha \).

\( \gamma \) is a barrier for \( \beta \) iff (a) or (b):

a) \( \gamma \) immediately dominates \( \delta \), \( \delta \) a blocking category for \( \beta \).

b) \( \gamma \) is a blocking category for \( \beta \), and \( \gamma \) is not IP.

\( \gamma \) is a blocking category for \( \beta \) iff \( \gamma \) is not L-marked and \( \gamma \) dominates \( \beta \)

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On the other hand, Otsu (1994) is concerned with an adjacency condition proposed by Takezawa (1987a) in testing Japanese-speaking children's knowledge of case particle deletion. Otsu's main purpose is to investigate children's knowledge of hierarchical phrase structure. In this sense, his purpose is the same as mine. But because he also deals with scrambled sentences, an additional condition for an OSV structure is needed.\(^3\) Otsu does not seem to consider the ECP, but the condition is assumed on the basis of a number of UG properties.

What is common in both studies is that, regardless of their specific interests and technical details, the phenomenon—case particle deletion—may be described as a subject-object asymmetry. Although I believe that the UG-based approach is basically on the right track in the sense of investigating the computational cognitive system for this phenomenon, I also have doubts regarding the principle-based account in two respects.

One doubt is that the principles of UG usually differentiate grammatical sentences from ungrammatical sentences, but as William O'Grady (personal communication) suggests, case particle deletion may not follow this black-and-white type of grammaticality. In 2.2.1, I have said that "case particles are rather freely dropped in

\[\alpha \text{ L-marks } \beta \text{ if } \alpha \text{ is a lexical category that theta-governs } \beta.\]

\(^3\) Takezawa (1987a, p. 126) proposes the following adjacency condition for case particle deletion.

(i) When an NP is adjacent to and c-commanded by V, the Case marker attached to it can drop.

In my study, this aspect was not investigated because I am focusing on sentences containing only one overt argument. The examination of scrambled sentences requires two-overt-arguments which I avoided testing due to their unnaturalness for my production tasks. (see 3.1).
colloquial speech. But this statement is valid only for certain types of discourse and speech styles. Discourse and speech styles may sometimes override what constrains case particle deletion. In other words, the case particle deletion rule may only differentiate sentences which are ideal and preferable from those which are not. Thus, the principles of UG, which rigidly determine violations for sentence formation, may not be the appropriate sort of notion to account for this particular phenomenon.

My other concern about the UG-based approach is that it is based on the assumption that UG principles are innate linguistic knowledge. A heated discussion has been going on about the nature of linguistic nativism, and I will not get into this issue here (see, for example, O'Grady, 1997). Although I would like to follow the assumption that the human mind includes an innate language acquisition device, I will leave open the crucial point as to whether the principles themselves (which are formulated within GB theory) are innate.

I believe that my approach is basically descriptive and theory-neutral. The assumptions I have made include hierarchical syntactic architecture where grammatical relations are structurally specified. I take a bottom-up approach for the investigation of the child's grammar, in contrast with a top-down approach of principle-based exploration. In chapter 2, I have presented two versions of the case particle deletion rules based on linguistic data. Then, I explored which versions of the rules or to what extent the generalizations are compatible with children's performance in experiments. In doing so, however, I have not discussed how the acquisition of case particle deletion takes place. Because I do not assume that innate principles such as the ECP explain why the
omissibility of case particle is learnable, the learning mechanisms remain to be accounted for.

5.2.2 Subject-object asymmetries in computation

I have suggested that the children's linguistic performance is consistent with (1) in which case particle deletion rule is attributed to a subject-object asymmetry.

(1) Subject-object asymmetry: A case particle on a direct object NP may be deleted, while that on a subject NP may not.

As I mentioned, I assume a hierarchical structure like (2) and I believe that children initially have the knowledge of the structural asymmetries between a subject and a direct object.

(2)

```
S
  / \  
subject VP
  /   \  
direct object V
```

As mentioned in chapter 2, a verb contains all information about its arguments. This includes the number of arguments (valency), types of arguments (thematic roles), and how arguments are syntactically represented (case). Children's sentence formation involves an operation of combining words into phrases compatible with (2), based on the information contained in the verb lexicon. This process must involve certain computations.

O'Grady (1999a) proposes the computational operations 'Combine' and 'Inherit' which play a crucial role in his system (e.g., O'Grady, 1991, 1997, 1999a). For example,
the transitive verb *yomu* 'read' in (3) has the combinatorial properties of taking two arguments, one denoting the reader and the other denoting something to be read, represented simply here as two Ns in angled brackets.

(3) $\text{yomu}_{tv} \quad <N \ N>$

As a first step, the operation 'Combine' applies to the verb and creates the constituent represented in (4).

(4)

```
V
/\
/  \
hon-o  yomu
|   <N N> |
'book-Acc'
```

Notice that the 'Combine' operation applies in a pair-wise (binary) fashion. Put differently, although the verb requires two arguments, it combines with them one by one, beginning with the direct object. Now, one of the argument requirements is satisfied, as the check mark in the angled bracket indicates, whereas the other unsatisfied combinatorial property is left for the other argument.

(5)

```
V_{iv}
/\<N>
/  \\hon-o  yomu
|   <N N> |
'book-Acc'
```

A second computational operation 'Inherit' passes the unsatisfied requirement for the other noun argument as indicated by the arrow in (5). The final step is 'Combine' again, now for the intransitive property of the $V_{iv}$ with its subject as shown in (6).
In these sentence formation procedures, what does the subject-object asymmetry suggest?

One result is computational distance from the verb. For sentence building, a verb is first combined with a direct object. Informally speaking, the verb is therefore computationally closer to its direct object than to its subject. According to O'Grady (1999c), this computational distance accounts for the typological facts about agreement. In languages like English and Spanish, the verb agrees with the subject, and person and number information of the subjects are morphologically manifested in the verb. There are also languages where the verb agrees with both the subject and the direct object, but no language requires the verb to agree only with the direct object. This is due to the fact that "the need for agreement to mark a head-argument relation increases with the computational distance between the two elements": the need for agreement is greater for subjects than for direct objects (O'Grady, 1999c). The same explanation must apply regarding the optionality of case-marking particles in Japanese. Since the direct object is closer to the verb than the subject, the case particle is required for the more distant subject.
Above, I have suggested two requirements for the case particle deletion rule to work well. One is a hierarchical structure, and the other is the computational operations of transmitting information from a verb to arguments in the course of sentence formation. At this moment, without discussing and speculating further, I would like to assume that these systems may not be learned from experience, at least in the first couple of years of life. Hence, I think that they are innately specified species-specific cognitive systems.

5.2.3 Unaccusativity and case particle deletion

As was observed in Experiment 1, the children tended to retain the nominative case particle for the arguments of intransitive verbs regardless of whether it was used with unergative or unaccusative verbs. At first glance, their performance seemed to be divergent from the target grammar where the sole argument of an unaccusative verb is assumed to be the sister of V, a position which allows case particle deletion (e.g., Kageyama, 1993; Nishigauchi, 1992).

However, the problem is that adults as well as children do not contrast case particle deletion between unergative and unaccusative verbs (see, Hirakawa, to appear), tending to retain the nominative case particle. This fact raises a question about the linguists' basic observation of case particle deletion for unaccusative verbs, the syntactic position of the subject of an unaccusative verb, and/or case particle deletion phenomenon

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4 For example, Miyagawa (1989), following Burzio's generalization (Burzio, 1986), suggests that the subject of an unaccusative verb moves outside of VP. If this is true, the unergative-unaccusative asymmetry in terms of case particle deletion would not be expected (see, e.g., Miyamoto et al., 1999).
as a property of unaccusativity. What linguists need to do is, I believe, to identify the source of the disagreement between linguists and ordinary native speakers: whether it lies in syntactic constraints, or there are some other factors such as discourse and speech styles.

Also, there is the possibility, as I mentioned above, that people may not follow linguists' observation since the omissibility of case particles may not be a black-and-white type of grammaticality. Rather, it may be a matter of preference due to computational distance between arguments and a verb. If this is true, the people's performance might be susceptible to non-syntactic factors such as the semantic functions of ga. However, it is necessary to examine adults' performance by various methods and tests, because the data from adult speakers are available only in Hirakawa's (to appear) study, as far as I am aware.

5.2.4 A role for input

In 5.2.2, I suggested that the mechanism of case particle deletion involves computational operations on hierarchical structure, and that they are independent of children's experience. Thus, I believe that the role of input is merely to give certain linguistic data so that the whole system may start to work. The data must involve something that evidences the optionality of case particles as in (7), which must be ample in parental input.

(7)  NP-ϕ V
An NP in (7) may be either a subject or a direct object, but the latter should be more likely.

Input deficiency is often discussed for the acquisition of abstract and complex syntactic phenomena (i.e., Type A phenomena). A central thesis—the poverty of the stimulus—is that certain aspects of grammar are underdetermined by the input, because children's output grammar involves something beyond the input. This logic, however, may not be compatible with case particle deletion in the sense that the existence of the phenomenon can be evidenced in a very simple sentence such as (7). On the other hand, the complexity (i.e., the syntactic constraint) of the phenomenon makes it controversial as to whether it is learnable from parental input. Although there is much evidence that case particles are often optional, the data may not explicitly provide the conditions of case particle deletion. In fact, whether or not the input data are informative must depend on how children's grammar analyzes an input sentence when it is received.

5.3 Morphological case-marking

5.3.1 Learning and input

According to O'Grady's (1999b) classification, Type B phenomena are relatively transparent aspects of grammar. Case particles are often claimed to be difficult for language learning, but this must be true only for their functional and pragmatic aspects. In terms of the basic use—case-marking for arguments—of nominative ga and accusative o, the rules are quite simple and clear as shown in 2.1; this contrasts with the rather abstract
notion underlying case particle deletion. Still, the children made many errors on morphological case-marking in Experiment 2.

As mentioned above, O'Grady (1999b) suggests that Type B phenomena are the product of learning that is sensitive to input and feedback. If morphological case is a Type B phenomenon, children's acquisition of this aspect may easily be influenced by input factors. What input factors cause children's morphological case-marking errors observed in my experiments? Because case-marking information can be conveyed by a very simple sentence and the parental input should not involve errors, I am considering a possibility of input deficiency. Namely, if the quantity of parental input is deficient, children might not learn well.

5.3.2 Input frequency

Caregiver's input to the child involves a variety of characteristics (see, for example, Owens, 1996) which, at first glance, seem to aid children in learning language. For example, slow and careful articulation, limited use of vocabulary items, and simplified short sentences are considered typical properties of caregivers' speech. However, the use of shorter and less complex sentence structures may not necessarily help in learning language. In Japanese parental input, for example, Clancy (1985, p. 514) points out that simplified speech by caregivers may involve case particle ellipsis. If this is true, the caregivers' speech might reduce the opportunity for the children to learn case particles.

Rispoli (1991) analyzes a total of 450 sentences in Japanese parental input: 300 sentences by 6 caregivers to 4 children reported in Rispoli (1989), and 150 more sentences
by 3 mothers spoken to 3 children. Because he examined only sentences involving action verbs that take theme or patient thematic roles, unfortunately all stative verbals and perceptual verbs were excluded from his analyses. Still, his study appears to offer a striking fact about information relating to morphological case in input.

His results show scant use of case particles in parental input. For example, sentences involving nominative case particles constitute only 8% of all intransitive sentences. In transitive sentences, nominative case particles were used 4% of the time, accusative particles 7%, and both nominative and accusative particles were used only 1%. According to these results, we might naturally be led to the conclusion that Japanese-speaking children receive very little information about morphological case-marking, and that the input deficiency in quantity may be the reason for children's errors and the time needed for learning case particles. However, these small percentages are partly due to the way Rispoli calculates his data. He counts all verbs, regardless of whether they were used with overt arguments, as the total number for the potential context for case particle use. But, two things must be taken into account. One is the ellipsis of arguments, and the other is topic particle drop.

---

5 Rispoli (1991) defines theme as moving entities and patient as change of state. Taking the framework of Role and Reference Grammar (e.g., Foley & Van Valin, 1984), he does not use terms "subjects" and "direct objects". When I use these terms in referring to Rispoli's data, therefore, I do so according to my own interpretation of his data.

6 This does not mean that the data undermine Rispoli's conclusions, since his purposes are different from mine.

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In terms of the first point, we should ask whether covert arguments should be counted as potential contexts for case particle use and deletion. At least for my purpose, the answer is 'No', because I would like to know what and how much case-marking information for argument NPs is given to children. If an argument is dropped from a sentence, there is no chance for the child to receive information about its case. Therefore, I would like to regard only overt arguments as the potential contexts for providing case information. According to this criterion, I recalculated Rispoli’s data. The results are compared with the original data in Table 5.3, where we see a considerable increase in case particle use in my recalculation. As is obvious from the table, when we focus on overt arguments, the children's chances of accessing information about morphological

<table>
<thead>
<tr>
<th>Table 5.3 Proportions of the Case Particle Use: Rispoli's (1991) Analysis and Recalculation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Subjects of intransitive verbs</td>
</tr>
<tr>
<td>Rispoli (1991)</td>
</tr>
<tr>
<td>8%</td>
</tr>
<tr>
<td>Subjects of transitive verbs (sentences involving only subject)</td>
</tr>
<tr>
<td>4%</td>
</tr>
<tr>
<td>Direct objects only of transitive verbs (sentences involving only direct object)</td>
</tr>
<tr>
<td>7%</td>
</tr>
<tr>
<td>Both subjects and direct objects of transitive verbs (sentences involving both subjects and direct objects)</td>
</tr>
</tbody>
</table>

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case-marking drastically increase. Still, the percentages seem to be relatively low, but another problem must also be considered.

The second point—the treatment of the topic particle *wa* for case particle deletion—is more extensively discussed in 2.2.1. In brief, since the topic particle can also be dropped in Japanese, we must consider contexts where the deleted particle is not a topic marker. In Rispoli's (1991) study, however, such a consideration was not taken into account. Therefore, it is likely that deleted particles involve topic markers as well as case particles, and I believe that the proportion of case particles in Rispoli's (1991) data would become even much higher than my recalculation, if we could exclude topic particle drop from the data. But, unfortunately there is no way to do this without accessing the original corpus.

On the other hand, Morikawa (1989) considers topic particle deletion when he counts frequency of case particles in parental input. Morikawa analyzes both parents' and child's use of case particles for a period of 17 months between the child's age of 1;11 and 3;3.\(^7\) She tries to identify deleted particles mostly from verb semantics and discourse context (for the methods, see Morikawa, 1989, pp. 162-166), and counted the totals of case particle deletion and topic particle deletion separately. While her methods might not necessarily be reliable in my view, her results were examined by 3 native speakers and their agreement rate reached 95.6% (p. 66). Thus, I assume that Morikawa's classifications

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\(^7\) As Morikawa herself notes, however, the original corpus does not include some parental language at the earlier period; therefore, 'any kind of frequency count from the input language is, to a certain extent, underestimated' (1989, p. 73).
and calculations reflect at least adult native speakers’ intuitions about particle use in Japanese.

Her results for case particle use/drop for intransitive verbs and for transitive verbs that take nominative subjects and accusative objects are summarized in Table 5.4.

Morikawa’s results reveal a much higher frequency of case particle use than do Rispoli’s data and my recalculations. A huge gap is seen between Morikawa’s results and Rispoli’s, especially for the frequency of the nominative case particle. If we take Morikawa’s data as more reliable because of her consideration of argument drop and topic marker drop, I think that children might have a fair chance to learn morphological case-marking.

<table>
<thead>
<tr>
<th></th>
<th>Transitive</th>
<th>Intransitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ particle</td>
<td>141 (83.9%)</td>
<td>724 (87.3%)</td>
</tr>
<tr>
<td>– particle</td>
<td>27 (16.1%)</td>
<td>105 (12.7%)</td>
</tr>
<tr>
<td>Overt subject total</td>
<td>168</td>
<td>829</td>
</tr>
<tr>
<td>Direct object</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ particle</td>
<td>344 (35.1%)</td>
<td>–</td>
</tr>
<tr>
<td>– particle</td>
<td>635 (64.9%)</td>
<td>–</td>
</tr>
<tr>
<td>Overt direct object total</td>
<td>979</td>
<td>–</td>
</tr>
</tbody>
</table>

Two asymmetries relevant to subjects and direct objects are observed in Table 5.4. The first asymmetry shows up when we compare the proportion of overt subjects and overt direct objects. Direct objects were used overtly about 5.83 times more often than subjects (979 vs. 168). This suggests that when an argument of a transitive verb is retained
in parental input, it is more likely to be the direct object than the subject. The other asymmetry involves the retention/deletion rate of case particles for subjects and direct objects. A case particle on a direct object was dropped much more often than that on a subject. In light of case particle deletion, this is the expected result. But what does this suggest for morphological case-marking? Do children have fewer chances for learning an accusative case particle and therefore make errors on direct objects more often than on subjects? Indeed, accusative case particles are more likely to be dropped; however, the absolute frequency of case particles shows that accusative particles are used more frequently than nominative particles with transitive verbs (344 vs. 141). On the other hand, if we include intransitive verbs as well, then the nominative case particle is predominant.

I am not sure what these data suggest for children's case-marking errors. Future research is required to investigate whether the frequency of case particles is related to case-marking errors, and if so, in what ways they are related. Analyses of verb semantics and argument animacy may reveal certain correlations between parental input and children's errors since their effects were found in Experiment 2. Overall, at this moment, what I can suggest from the above data is that the amount of input regarding morphological case particles is probably not the reason for the children's errors. In other words, children seem to have a fair chance to learn morphological case from input, which again leaves a question as to why they make errors.

I think that three cautions must be observed in the interpretation of the data. One is that there is no explicit criterion for determining how much input and what kind of input may be sufficient for the acquisition of a particular phenomenon. Second, there is a great
deal of individual difference in the proportion of overt case-markers in caregivers' speech (e.g., Clancy, 1985; Matsuoka, 1998).\(^8\) Third, the input data discussed above are only representative and have no direct connection to the children tested in my experiments.\(^9\)

Although I have focused on what linguistic information is provided in input, there is another aspect of input still to be investigated, especially for Japanese. That is, the way linguistic information is provided—the manner of input—might be informative about how case particles are learned. For example, Saxton (1997) suggests that certain types of parental recasts can signal ungrammatical sentences, and that children can make use of the information provided in this way to learn certain aspects of English grammar. It is often claimed that negative evidence is not available in parental input, and that a child may not benefit from negative evidence even if it is available (e.g., Marcus, 1993; Pinker, 1989, White, 1989). This may be true for Type A phenomena, but this line of research on Type B phenomena remains to be investigated in Japanese. O'Grady (1999b) suggests the need for future research on the nature of learning Type B phenomena in general, asking "Does it involve classical hypothesis formation over symbolic representations or does it involve the strengthening of particular patterns of neuronal activation without reference to representations (the connectionist view)?" Much still remains to be done.

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\(^8\) For example, Matsuoka (1998, pp. 68-69) compares the proportions of *ga*, *o*, and *ni* in parental speech from three data sets, and observes that the nominative and accusative does not follow a uniform pattern.

\(^9\) Morikawa (1989) investigates the correlation between parental input and the child's use of case particles.
CHAPTER 6
CONCLUSION

Japanese-speaking children's case particle deletion and morphological case-marking have been experimentally investigated in this dissertation. The main findings involve some intriguing contrasts between the two phenomena.

In terms of case particle deletion, even younger preschool children basically followed the constraint based on subject-object asymmetry: a case particle on a direct object NP may be deleted, while that on a subject NP may not. On the other hand, even older preschool children often made errors in the use of case particles. Statistical analysis revealed that case particle deletion was not affected by any factors that influenced the children's errors on morphological case-marking. These results have led me to the conclusion that the acquisition of these two aspects of Japanese case lies in quite different learning mechanisms.

For the investigation of the learning mechanisms, there remains much to be done in further experimental studies. For case particle deletion, the youngest children in the experiments reported here were 3-year olds, whose performance was in principle identical to adults'. Then, how about much younger children? If an inborn computational cognitive system is responsible for case particle deletion, even 2- or 1-year-old children might demonstrate some evidence for the subject-object asymmetry. Recent advances in technology might enable us to test children before age 3 in this regard.
I believe that acquisition studies must be pursued within a representation-based theory. The target grammar must be explicitly described, so that we may investigate how children acquire their linguistic knowledge. In this regard, further research on the relationship between unaccusativity and case particle deletion is necessary.

There is much more to be done regarding morphological case-marking. In order to account for the children's errors in the experiments, I formulated a number of tentative hypotheses. The next step is to make these hypotheses into empirical questions for further studies. In doing so, we must design our studies in such a way that the multiple factors may be disentangled. However, at the same time, it may also be necessary to consider other plausible factors which might affect children's use of case particles in various ways.

For example, a word-order variable was completely excluded from my experimental manipulations due to its unnaturalness in my experiments, but it must play a role for children's case-marking. It is necessary to investigate how case particle use and word order interact in child Japanese. Lastly, research on input factors, especially parental feedback might reveal some clues about how children learn to use case particles.

From a much wider point of view, I think that language-particular phenomena must be investigated and discussed in a cross-linguistic context. Different languages adopt different ways to indicate grammatical relations, one of which is morphological case. But, rules of case-marking and constraints on the omissibility of case particles are assumed to be manifestations of universal properties of language which must be learnable for any child. In this sense, the study of Japanese case could be a window to further exploration of the nature of language acquisition and language itself.
Appendix A

For Experiments 1 - 3, the following types of utterances were not counted as target sentences for the purposes of my analysis.

1. The child's response *wakaranai* 'don't know'

2. Why question *doosite* 'Why?'

3. When an overt noun (non-*wh*-argument) was used without a case particle

   e.g., In context where unknown entity is pushing a pig, the child guessed it was a dog

   and asked;

   Inu-φ okosita no?
   dog got up Q
   'Did a dog get X up?' or
   'Did X get a dog up?'

4. When a topic particle was used on a *wh*-argument

   e.g., Dare-wa tataita no?
   who-Top hit Q
   'Who hit X?' or
   'Who did X hit?'

5. A sentence containing a relative clause

   e.g., Tbeta no dare?
   ate one who
   'Who is the one that ate?'

6. When a verb was replaced with an onomatopoeic expression

   e.g., In context where a tiger hit an unknown entity

   Dare-ο ban tte yatta no?
   who-Acc bang quotative did Q
   'Who did X do bang?'
7. When the target verb was changed (including transitivity errors)

   e.g., In a context where an unknown entity opens (the verb was *aku 'open iv. '*)

   Dotti-ga patan tte aketyatta no?
   which-Nom onomatopoeia quotative opened iv. Q
   'Which did X open?'

8. A sentence consisting only of a *wh*-word

   e.g., Dare?
   who
   'Who?'
### A.1 ANOVA Table for the Children's Production of the Target Form in Experiment 2

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<th>$P$</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Age groups (AG)</td>
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<td>.276</td>
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<td>.445</td>
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<td></td>
<td></td>
<td></td>
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<td>Grammatical relations (GR)</td>
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### A.2 ANOVA Table for the Children's Production of the Target Form in Experiment 3

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<td></td>
<td></td>
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<td>Age groups (AG)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Grammatical relations (GR)</td>
<td>.119</td>
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<td>.119</td>
<td>1.327</td>
<td>.260</td>
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REFERENCES


Hale, Ken, & Keyser, Jay. (1987). A view from middle. Lexicon project working papers, 10. MIT.


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