Case Particle Errors in Japanese: Is the Nominative *ga* a Default Case Marker in Sentence Production?*

Noriko Iwasaki
University of California, Davis

This study examines experimentally induced case particle errors in Japanese. It was found that the nominative *ga* was the preferred particle for sentence-initial NPs and was the most frequently overused particle for argument NPs, providing some support to the claim that *ga* is a default marker. The study also shows that case particle error occurrence depends on verb type, suggesting the importance in future studies of experimentally controlling or manipulating the number of opportunities for speakers to produce NPs occurring with specific verb types.

1. Introduction

In Japanese, grammatical roles such as subject and object are marked by case particles. Because Japanese is a pro-drop language with relatively free word order, the role of case particles is crucial both in sentence comprehension and sentence production. Particles such as the nominative *ga*, accusative *o* and dative *ni*, shown in (1), and genitive *no*, are generally classified as markers for structural Case—although *ni* can be classified as either the dative marker or a postposition (the equivalent of English prepositions *to*/*towards*/*in*) depending on the context (see Sadakane and Koizumi 1995). Examples of typical postpositions are *kara, to*, and *de*, which are roughly equivalent to the English prepositions *from*, *with*, and *at*/*by* as in (2).

(1) Maya-ga Yayoi-ni banana-o age-ta.
M -NOM Y -DAT banana-ACC give-PAST
'Maya gave a banana to Yayoi.'

(2) Haruka-ga puuru de oyoi-da.
H -NOM pool in/at swim-PAST
'Haruka swam in the pool.'

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In a generative linguistics framework, the nominative *ga* in a subject NP is generally considered to be licensed by INFL, and the accusative *o* in an object NP to be licensed by V. Postpositions are selected by the meaning of the PP.

Adopting the sentence production model which postulates a Functional Level stage where functions of NPs are determined based on the intended message and a Positional Level stage where positions of NPs and morphological features are specified (Garrett 1975; Levelt 1989), distinct mechanisms for structural Case and postpositions can be assumed. Postpositions are selected earlier at the Functional level (i.e., retrieved from the mental lexicon) based on meaning while structurally assigned case particles are selected later at the Positional Level (i.e., selected as features of sentential frames built by grammatical information that is activated by the selection of the verb).

Terao (1995a) analyzed speech errors of case particles in his corpus and found that the errors were predominantly comprised of substitution errors in which intended structural case-markers (i.e., *ga, o, no*) were substituted with other structural case-markers (e.g., errors in which intended *o* is replaced by *ga*). He suggested that these error patterns indicate that structural case-markers possess properties that are distinct from other case particles. In particular, *ga* was the most frequently overused particle; out of a total of 373 case particle speech errors, 100 were erroneous uses of *ga* where other particles were required.

2. Defaultness of *ga*?

Some linguists argue that the nominative *ga* is the default Case (e.g., Fukui 1986; Inoue 1997). Although the accusative *o* is generally considered to be a structural Case marker, some linguists argue that *o* is an inherent Case marker (e.g., Inoue 1997; Fukui and Takano 1998), leaving *ga* (and *no*) as the only structural Case. The defaultness of *ga* is also suggested in errors produced by aphasic patients (Sasanuma et al. 1989) and children acquiring Japanese as their first language (Ito 1990; Nishigauchi 1993).

A question arises as to whether the status of *ga* as the marker of default Case in theory has any consequences for real-time sentence production processes. To address this question, Terao (1995a) examined two possible ways in which *ga* errors occur as default in his corpus of naturally occurring speech errors. First, he examined whether a hypothesis that Ito (1990) postulated to account for children's errors—that *ga* is used for the sentence-initial NPs—can account for adults' errors. He found that only 48% of the relevant *ga* errors occurred in sentence-initial NPs, but maintained there is a possibility that *ga* may become the most activated in the sentence-initial position due to its frequency of occurrence in this position. Second, he examined the possibility that *ga* errors occur when the subject NPs are phonologically null and there are no overt NPs where *ga* can be assigned—errors such as in (3) from Terao (1995a: 253). In this instance, the intended target particle was the accusative *o*, but *ga* was used. Note that errors of case particles will be indicated in capital letters, and grammatical use of case particles most relevant to the discussions will be marked with bold.

(3) Sassoku hagaki-GA yonde mitai to omoimas-u.
right.away postcard-NOM read want COMP think-NONPAST
'Now, I will read the postcard.'

Terao found that there were no overt subject NPs in 59.3% of the sentences where the relevant *ga* errors occurred. He found that in the remaining 35 cases, 20 were due to anticipation or perseveration, which Terao (1987) found was a common source for particle errors. Thus, most instances of *ga* errors, if not anticipations/preservations, occurred when overt subject NPs were not present. Terao (1995a) indicated a few possible accounts for this trend for future research. First, he suggested that *ga* errors may be caused by high activation of *ga* due to the fact that *ga* is the particle associated with argument structures of both transitive and intransitive verbs in the mental lexicon. Second, he raises the possibility that semantic properties of object NPs bearing similarity to agent NPs cause *ga* errors for object NPs. Third, he suggests that the drive to satisfy the Extended Projection Principle (requiring subject NPs in all clauses) may lead to a hierarchical relationship among case particles, with *ga* more prominent than *o*; this could lead to violation of the requirement to assign *o* to the object NP in favor of the use of *ga*.

The current study revisits the experimentally induced data that Iwasaki (2000) collected and examines both grammatical use and erroneous use of *ga*. Iwasaki (2000) conducted an experimental study where errors were elicited using a picture description task. She found that *ga* was not the most frequently overused particle among experimentally induced substitution errors, casting doubt that there are any consequences of the claimed defaultness of *ga* in sentence production processes. However, the difference between natural conversations and experimental picture descriptions needs to be considered in the light of differential linguistic contexts and opportunities for errors that these two settings provide. Crucially, because the participants followed the instructions of the experiment (i.e., to describe target pictures mentioning all participating entities indicated in the pictures), subject NPs were overtly expressed most of the time. This is in contrast to natural conversations in Japanese where NPs whose referents are easily inferred from the context are not overtly expressed. It is important then to examine the data to verify the extent to which overt NPs were present in the participants' responses and to see whether the subject NPs were marked by *ga* when they were overtly present. It is also important to examine whether sentences without overt subject NPs were more prone to errors.

Experimental data can also be used to answer some of the questions Terao (1995a) raised. First, we can examine whether pictures that induce simultaneous activation of two related verbs (transitive and intransitive) caused more errors of *ga* for the object NPs than those pictures that can only be described by transitive verbs. One type of picture used by Iwasaki (2000) could be described by either transitive or intransitive verbs (e.g., "Chopsticks broke"/"A man broke chopsticks"). Second, we can examine whether, in the experiment, animate patient NPs caused more errors of *ga* than inanimate patient NPs due to their semantic similarity to agent, which may often be associated with the nominative case. The experimental data also reveal the likelihood of errors for different types of events and verbs because they allow us to examine the percentage of er-

ror occurrence relative to the number of opportunities to produce errors with certain verb types.

3. Experiment

The current study revisits experimental data collected by Iwasaki (2000) and analyzes the first 30 participants' picture description responses.[1] Hence, we first describe the method adopted by Iwasaki (2000).

3.1 Method

3.1.1 Participants

All 30 participants were native Japanese speaking students enrolled in Japanese universities in Kobe, Japan.

3.1.2 Materials

Sixty pictures, drawn to elicit 8 types of events/verbs, were presented on a computer screen. The intended target verb types were: three types of transitive verbs (i.e., actions causing changes to the object NPs such as *taberu* 'eat', actions affecting the object NPs without causing obligatory changes such as *keru* 'kick', and verbs whose meanings do not affect object NPs such as *miru* 'watch'), two types of intransitive verbs (unergative e.g. *warau* 'laugh' and unaccusative e.g., *tuku* 'arrive'), verbs requiring postpositions for the object NPs rather than the accusative marker (e.g., *X ni au* 'meet X'). In addition, there were pictures of events that can be described using either a transitive verb (e.g., *waru* 'break (something)') or its intransitive counterpart (*wareru* '(something) breaks'), e.g., 'The dish broke and the boy apologized'/ 'The boy broke the dish and apologized', and those of events that involve an item possessed by the patient ('The thief stole the woman's purse'/'The woman got her purse stolen by the thief'). The pictures for intransitive verbs indicated oblique NPs (location, instrument) in addition to the subject NPs (e.g., a woman walking in a park, a baby in a chair crying, a train arriving at a station, a boy tripping over a stone) in order to increase the complexity of pictures and of resulting sentences to make the picture description tasks comparable across different verb types and to give opportunities for the participants to use postpositions.

3.1.3 Procedures

The pictures were presented on a computer, using SuperLab (Cedrus Corporation). One of the participants/objects/entities (e.g., agent, patient, or location) was highlighted with color. Each picture was presented twice in an experimental session with a different object/entity being highlighted each time. This was to elicit two descriptions with different word orders, canonical (Subject-Object-Verb, for transitive verbs, and Subject-Oblique-Verb for intransitive verb events with location or instrument) and non-canonical (Object-Subject-Verb or

[1] There were a total of 63 participants in the experiment, and more analyses are to be conducted in the future.

Oblique-Subject-Verb), for each picture. Each picture was presented until the subject finished its description and pressed a key to proceed. The presentation duration of each picture was measured. The subject's task was to describe the pictures as quickly as possible. The subjects were informed that sentence production under time pressure was being investigated.

3.1.4 Analyses

Initially, particle use across all responses (including correct responses) was examined. First, the number of overt subject NPs was counted, both for target verb type predicates and for the full sentences. This is because a picture description sometimes contained subordinate clauses and either the subordinate clause or matrix clause had non-overt subject NPs. Then, the frequencies of *ga* and *wa* (topic marker) used for these subject NPs were tallied. Secondly, occurrences of each particle appearing in the first NP of the matrix clauses were counted.

Speech errors were then extracted from the data set. All deviant uses of case particles were first selected, but marginal errors (i.e., non-standard use that may be accounted for by individual variations or language change[2]), errors of *ni* replacing *de* for two pictures that were apparently difficult to describe (as evidenced by high frequency of errors among the participants[3]), and errors that occurred in descriptions that do not contain the target verb types were excluded. Errors other than substitution errors (omission, addition, exchange and shift) were removed from this set.

The frequencies of error types and their positions (i.e., whether they occurred in sentence-initial position or not) were examined. Further, frequencies of types of errors occurring with two restricted sets of NPs were analyzed. First, errors appearing with only targeted NPs were analyzed, excluding errors that occurred with NPs that participants provided as additional information. For example, a participant made an error in the Japanese equivalent of the italicized part of 'the man climbed to *the top of* the mountain' when the targeted event was 'the man climbed the mountain'. Because not all of the participants had the same opportunities to produce the particles in such extraneous descriptions (in this case *no* in *yama no tyoozyoo*), they were removed for this analysis. Second, errors occurring with only argument NPs were analyzed in order to examine the pat-

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[2] For example, some of the participants used *kara* for the verb *sotugyoo suru* 'graduate', which requires the accusative *o* in standard Japanese.

[3] For the description of a picture in which a girl slipped on a banana peel, almost 1/3 of the time participants made the error of using *ni* (rather than instrumental *de*). This was not a case of individual differences since many corrected themselves. Another picture that was somewhat problematic and caused some errors was a man sitting on a chair and laughing. Difficulty with these pictures may be due to the awkwardness of intended simplex (one-clause) sentences. The Japanese equivalents of "A girl slipped on a banana peel" (*Onnanoko ga banana-no kawa-**de** subet-ta)* and "A man is laughing on a chair" (*Otoko-ga isu-**de** waratte i-ru*) may be awkward to some native speakers. (The more natural descriptions may be "A girl stepped on a banana peel and slipped" (*Onnanoko-ga banana-o hunde subet-ta*) and "A man, seated on the chair, is laughing" (*Otoko-ga isu-ni suwatte waratte i-ru*). Though it would be interesting to examine the possible causes of the use of *ni*, the greater difficulty of these pictures (relative to other pictures) would inflate errors of *ni* substituting for *de*, and thus are excluded in the current analyses.

terns of error when structural case-markers (or postpositions lexically required by the verbs) were intended. Errors occurring with oblique NPs (e.g., postpositional phrases indicating location of activities) were excluded from this analysis. Iwasaki's (2000) analysis of case particle errors did not distinguish between different types of *ni* with the contention that it would be misleading to determine the linguistic properties of overused *ni* (whether it is a structurally determined dative marker, or postposition) solely by the position it appears in, but such an analysis might have obscured the patterns of *ni* errors.

In order to examine whether the semantic properties of NPs that resemble agents lead to a higher tendency for *ga* errors, percentages of *ga* occurrences of all picture descriptions of animate versus inanimate patient NPs were compared. Finally, the percentage of errors occurring with each verb type relative to the total number of descriptions of that particular verb type was computed to see if any specific verb types lead to more particle errors.

3.2 Results

3.2.1 Non-overt subject NPs and particle errors

There were a total of 176 non-standard uses of case particles within 3,049 responses that contained the target verb types (85% of the picture descriptions). The removal of marginal errors and errors due to high frequency error pictures yielded 122 errors and an error rate of 4%.

Among the 3,049 responses containing the targeted verb types, there were only 18 instances in which subject NPs were not overtly expressed in their sentences. No errors of case particles occurred in these 18 responses. There were also 268 instances in which the targeted verb types did not occur with overt NPs in the same clause, and in which overt subject NPs were present elsewhere in the sentence (e.g., the equivalent of "The cat targeted a goldfish in the vase and ate it," for the target event of a cat eating a goldfish to include the target verb 'eat'). Within these 268 instances, there were 9 errors (an error rate of 3%), including 4 *ga* errors. Overall, this confirmed that unlike natural conversations, the subject NPs were overtly expressed most of the time, but there were too few instances of non-overt subject NPs to make any claims that sentences with no overt NPs are more prone to the overuse of *ga*.

3.2.2 Particles used for overt subject NPs

Overt subject NPs were often marked with *ga* as expected. In terms of the subject NPs of clauses that contain the target verb types, of 2,670 overt NPs, 2,002 (75%) were marked with *ga* and 668 (25%) with *wa*. Among the 3,550 overt subject NPs of all matrix clauses (including sentences in which clauses of target verb type predicates are embedded), 2,549 (71.8%) were marked with *ga* and 1,001 (28.2%) *wa*.

It is also worth noting that 50.6% of the first NPs were marked by *ga* despite the fact that half of the time the NPs that the participants were instructed to produce as the first NPs in their sentences were patient NPs or oblique NPs for the target verb. The participants often used passive sentences (even if they resulted in unnatural sentences) as shown in (4a), subordinate clauses such as shown in (4b) and relative clauses such as shown in (4c). The sentence (4a) was

used to describe a picture of a boy breaking a dish (with the dish being highlighted), (4b) to describe a girl listening to music (with a radio playing music highlighted), and (4c) to describe a girl playing the piano (with the piano being highlighted). These examples indicate that the participants may have preferred to use *ga* for sentence-initial NPs, and this may have resulted in structures such as passives, rather than scrambled Object-Subject-Verb sentences that require *o* for the first NP (e.g., *osara-o otokonoko ga watte…*). Note that we are concerned only with immediate constituents of the matrix clause. In sentence (4c), *piano* 'piano' is linearly the first noun, but *piano-o hiite ita onnanoko* 'a girl who was playing the piano' is considered to be the first NP.

(4) a. Osara-**ga** otokonoko niyotte warare, okaasan ni mitukarimasi-ta.
dish -NOM boy by broken mother-by find-PAST
'A dish was broken by the boy and (it was) found by his mother.'

b. Ongaku-**ga** nagarete ite, onnanoko-wa sore-o kiite odotte imas-u.
music-NOM played was girl -TOP it-ACC listening dancing is
'Music was played and the girl listened to it and started to dance.'

c. Piano-o hiite i-ta onnanoko-**ga** hakusyu kassai-o abi-ta.
Piano-ACC play was girl-NOM clap applause-ACC receive-PAST
'The girl who was playing the piano received applause.'

3.2.3 Intruding particles and their targets

Among these 122 substitution errors, the frequencies of types of intruding particles were *o* (30) > *ni* (29) > *ga* (22) > *no* (18), and their interaction with the intended particles is shown in Table 1. This appears to be quite different from what has been reported about naturally occurring errors by Terao (1987, 1995a) and by Iwasaki (2000). Terao (1995a) reported *ga* (100) > *o* (65) > *ni* (38) and Iwasaki (2000) reported *ga* (133) > *o* (81) > *ni* (64).[4] Table 1 shows the frequencies of intruding errors for each target particle. The intruding *ga* almost exclusively substituted for the targeted *o*.

[4] Iwasaki's (2000) naturally occurring speech error data comes from both Terao's (1995b) corpus and Iwasaki's own corpus, and the patterns of errors therefore naturally resemble Terao's (1995a) study, which is based on Terao 1995b.

Table 1
Target and intruding particles: All NPs

Target particle	*Intruding particle*								
	ga	*o*	*no*	*ni*	*de*	*to*	*kara*	*wa*[5]	*Total*
ga	—	11	4	2	0	1	0	4	22
o	20	—	4	5	1	0	0	4	34
no	0	10	—	2	1	0	2	0	15
ni	2	4	10	—	6	0	0	3	25
de	0	3	0	18	—	0	0	0	21
to	0	0	0	1	0	—	0	0	1
kara	0	0	0	1	1	0	—	0	2
wa[6]	0	2	0	0	0	0	0	—	2
Total	22	30	18	29	9	1	2	11	122

The pattern looks somewhat different when errors that occurred with extraneous NPs, those whose referents were not intended in the pictures' verbal descriptions, were excluded. When only the 83 errors that occurred with target NPs, those whose verbal descriptions were expected based on the content of the pictures, were considered, the results were *ga* (19) = *ni* (19) > *o* (18) > *no* (11) > *de* (6). Many of the non-target NPs occurred with *o* (12) and *ni* (10) errors. Table 2 shows the interaction of the intruding and target particles within the errors that occurred with targeted NPs. Both Table 1 and 2 show that the intruding *ni* replaced the targeted *de,* which suggests that this intruding *ni* is likely to be postposition *ni* selected on the basis of its meaning rather than the dative marker that is selected for structural reasons.

[5] Instances in which participants first produced *wa* but corrected themselves, producing a different particle, were considered to have *wa* error for other target particles. For example, in the response *Inu-WA, inu-ni booru-ga atarimsita* 'A ball hit a dog', *wa* was considered to be the intruding particle and *ni* the target particle.

[6] Although there are no obligatory contexts for the topic marker *wa*, in two instances in which a participant said *o* but immediately corrected to *wa* (e.g., *neko O, wa, onnanohito-ni kisu-o sarete yorokon-da* 'The cat was kissed by a woman and was happy'), *wa* was considered to be the target particle.

Table 2
Target and intruding particles: Targeted NPs

Target particle	*Intruding particle*								
	ga	*o*	*no*	*ni*	*de*	*to*	*kara*	*wa*	*Total*
ga	—	8	4	0	0	1	0	4	17
o	18	—	4	3	1	0	0	4	30
no	0	5	—	1	1	0	0	0	7
ni	1	1	3	—	4	0	0	1	10
de	0	2	0	14	—	0	0	0	16
to	0	0	0	0	0	—	0	0	0
kara	0	0	0	1	0	0	—	0	1
wa	0	2	0	0	0	0	0	—	2
Total	19	18	11	19	6	1	0	9	83

As expected, the pattern is very different when only errors occurring with target *argument* NPs (i.e., referents that were intended to be used either as agent or patient, excluding location and instrument) were considered. Among a total of 53 errors that occurred with argument NPs, the frequencies of errors were *ga* (18) > *o* (11) > *no* (9) > *de* (3) > *ni* (2). Table 3 shows the interaction between intruding and target particles. When only argument NPs are considered, *ga* is the most frequently overused particle.[7]

Table 3
Target and intruding particles: Argument NPs

Target particle	*Intruding particle*								
	ga	*o*	*no*	*ni*	*de*	*to*	*kara*	*wa*	*Total*
ga	—	8	4	0	0	1	0	4	17
o	18	—	3	2	1	0	0	4	28
ni	0	1	2	—	2	0	0	1	6
to	0	0	0	0	0	—	0	0	0
wa	0	2	0	0	0	0	0	—	2
Total	18	11	9	2	3	1	0	9	53

3.2.4 Positions of errors

In order to determine whether *ga* errors are more prone to occur in sentence-initial position as compared to other particle errors, the proportion of errors occurring in sentence-initial position was computed for each case particle. The number of case particle errors occurring in sentence-initial position was compared to the total number of errors for each case particle. It was found that of 122 errors,

[7] Because only argument NPs are considered in table 3, particles such as *no*, *de*, *to* and *kara* are no longer target particles for most NPs, with the exception of some instances of *ni* and *to* (that is, when they are the lexically-required particles of object NPs).

68 errors followed either the first N (within the first NP, e.g., *ohuro O—no mizu* [bathtub-ACC—GEN water] 'bathtub's water') or first NP of the sentence (or clause). In terms of the proportion of initial NPs, 43% (13/30) of *o* errors, 62% (18/29) of *ni* errors, and 86% (18/22) of *ga* errors occurred with sentence-initial NPs. Thus, there is a tendency for *ga* errors to occur more often in the sentence-initial positions than the other particles.

3.2.5 Animacy

The frequency of animate versus inanimate patient NPs exhibiting *ga* errors was examined to determine whether animacy, as a semantic property strongly associated with agent, increased the occurrence of *ga* errors. There were 626 descriptions with animate patient NPs that contained the target verb types and 950 descriptions with inanimate patient NPs that contained the target verb types.

Only one *ga* error occurred with an animate patient NP, shown in (5), while there were 17 *ga* errors occurring with inanimate patient NPs.

(5) Otokonoko-wa inu-GA ketobasi-ta.
boy -TOP dog-NOM kick away-PAST
'The boy kicked the dog away.'

Thus in the current data, animacy does not affect the occurrences of *ga* in the direction expected by the hypothesis that animate NPs induce more *ga* errors.

However, it is premature to consider this finding conclusive. There are two factors that might have contributed to the larger number of errors with inanimate NPs marked as *ga*. First, many of the *ga* errors with inanimate patient NPs (10 of 17) occurred with pictures that could be described by either a transitive or its intransitive counterpart (e.g., *otosu*/*otiru* 'drop'; *oru*/*oreru* 'break'; *naosu*/*naoru* 'repair'). This means that it might be the simultaneous activations of dual plans (e.g., *Onnanoko-ga kabin-**o** otosite..* 'A girl dropped a vase and..' / *kabin-**ga** otite..* 'A vase fell and…') that led to more errors of *ga* with inanimate patient NPs used as the object NP of scrambled OSV sentences such as in (6).

(6) Kabin-GA, e, kabin-o onnanoko-ga wat-ta node.
vase-NOM uh, vase-ACC girl-NOM break-PAST because
'Because a girl broke a vase…'

Although the events with animate patient NPs can also be described by multiple plans, two sentence types that the experimental participants preferred (i.e., active and passive sentences) do not lead to *ga* errors. For instance, a picture of a hunter having shot a bird can be described either by an active sentence *Ryoosi-ga tori-o ut-ta* 'A hunter shot a bird' or a passive sentence *Tori-ga ryoosi-ni utare-ta* 'A bird was shot by a hunter'. Unlike inanimate subjects in passive sentences, passive sentences with animate subjects are natural sentences. Since the use of *ga* for patient as the first NP leads to a grammatical passive, *ga* errors do not occur. The participants preferred the passive sentences to the scrambled OSV sentences, which could have induced *ga* errors on the first NPs. Thus, the experimental materials did not induce *ga* errors on animate patient NPs.

The facts that animate patient NPs can more naturally be used as subject NPs of passives and that participants preferred the passive sentences to OSV sentences for the animate patient NPs may suggest a connection between animacy and subjecthood. However, there is little evidence of a connection between animacy and (errors of) *ga*, the particle that is the most associated with the grammatical subject.

3.2.6 Verb types and error rates

Frequencies of errors for particular case particles may differ depending on verb type for semantic or structural reasons. For example, semantic roles of subject NPs and object NPs depend on the verb types that they occur with (i.e., a subject NP occurring with a transitive verb is a volitional agent, while a subject NP occurring with an unaccusative verb is a theme). Thus, different verb types were used in the experiment to examine frequencies of case particle errors that occurred with each verb type. Table 4 shows the verb types and rates of errors that occurred with targeted NPs.

Table 4
Verb types and error rates

Verb type	*Number of descriptions*	*Number of errors*	*Percentage of error occurrence*
Transitive with changes	324	2	0.6%
Transitive without changes	537	7	1.3%
Transitive without affecting NP	176	5	2.8%
Intransitive (Unergative)	433	16	3.7%
Intransitive (Unaccusative)	424	12	2.8%
Transitive with NP-*ni*/*to* Objects	310	9	2.9%
Transitive/Intransitive counterparts	420	14	3.3%
Two animates and possession	311	18	5.8%

The error rates differ depending on the types of verbs/events that the descriptions contained. There were very few errors for canonical transitive verbs—those that cause changes to the patient NP (e.g., Tsunoda 1990). In contrast, events involving three nouns (two animates and possession), such as an old woman patting a boy's head, a thief stealing a woman's purse, or a dentist pulling a boy's tooth, led to higher error rates. The errors include various intruding–target particle pairs: 5 *GA–o*, 3 *O–no*, 2 *O–ga*, 3 *NO–ga* and 2 *NO–o*, for example. Following this verb/event type are unergative verb events such as a baby crying on a chair, a woman sitting down on a bench, and a woman walking in the park. Most errors with this verb type (12/16) were the use of *ni* when *de* (indicating the location of activities) was the target. The verb/event type that led to the third highest frequency on the list is comprised of events that can be described by either transitive verbs or their intransitive counterparts. An example of an error is shown in (7).

(7) koohii-GA a, koohii-o weitaa-ga kobosimasi-ta.
coffee-NOM uh, coffee-ACC waiter-NOM spill-PAST
'The waiter spilled coffee'

In this example, as well as descriptions of other pictures of this type, the patient NP can be either an object NP of a transitive verb (e.g., *kobosu* 'to spill something') or a subject NP of an intransitive verb (e.g., *koboreru* 'to get spilled'). It is possible that the *ga* is highly activated because both intransitive verbs and transitive verbs can occur with the subject NP followed by *ga*, as Terao (1995a) suggested. An alternative account for these events is the likelihood that alternative sentence plans were blended.

4. Discussion

This study first confirmed that the experiment participants used overt subject NPs most of the time. This may explain why *ga* was not the most frequently overused particle, contrary to previous findings based on naturally occurring errors, and giving some support to Terao's hypothesis that Japanese speakers tend to make *ga* errors in sentences where no overt subject NPs are present.

A preference to use *ga* for the first NPs occurring in a sentence was observed among the participants, and most overt initial NPs were marked with *ga*. The participants' attempts to produce grammatically correct sentences while at the same time accommodating their preference to use *ga* for first NPs are evident in their production of passive sentences, subordinate clauses, and relative clauses such as those seen in (4a–c). Occasionally, their disfluency also seems to reflect such attempts, as shown in (8b).

(8) a. Koohii-**ga** … koboreta node weitaa-ga okyakusan ni ayamat-ta.
coffee-NOM got.spilled as waiter-NOM customer to apologize-PAST
'Since the coffee got spilled, the waiter apologized to the customer.'

b. Totemo takusan-no sara-**ga**, etto, e, oite at-ta node,
very many-GEN dish-NOM well, uh, was place-PAST because
onnanoko-wa issyoo kenmei sara-o arat-ta
girl -TOP very hard dish-ACC wash-PAST
'Because there were lots of dishes, the girl worked hard to wash them.'

In both (8a) and (8b), it appears that the speakers either built sentences or modified their intended sentences after they produced the sentence-initial NP followed by *ga*. Such monitoring and editing may be more prevalent in experimental settings than in natural settings especially because the speakers participating in the experiment changed their initial sentence plans in order to follow experi-

mental instructions.[8] However, it is plausible that Japanese speakers also engage in such processes to a certain extent in natural conversation as well.

The data across all NPs produced in the experiment showed that there was a preference for the use of *ga* especially for sentence-initial NPs, but error patterns did not show any salient pattern for *ga*. However, the examination of experimental data revealed that *ga* is the most frequently overused particle when only argument target NPs were considered. The use of *ga* then is sensitive to whether or not the NP is called for by grammar (either by sentence structure or by argument structure information associated with verbs in the mental lexicon).

The claimed defaultness of *ga* by no means prevails to the extent to which it would erroneously replace other particles indiscriminately. These close ties of *ga* to grammar are also evident in the relatively frequent occurrences of *ga* errors in descriptions of pictures that could be described either by transitive verbs or their intransitive counterparts. The particle *ga* may be simultaneously activated either by two possible sentence plans or by two related semantically similar lexical items. These findings support the assumption that the selection of *ga* is processed at the Positional Level stage where sentence frames are built utilizing the grammatical information activated by selected verbs.

The particle *ga* then is activated in multiple ways. First, it appears that *ga* is used for the sentence-initial NPs in cases in which the sentence planning is incomplete. Rather than waiting to complete a sentence plan in order to articulate a sentence, producing a fragment with *ga* may allow Japanese speakers to achieve efficient incremental sentence production. Because *ga* seems to be the most frequently used particle, such fragments can be completed without errors (sometimes with some editing), and only occasionally result in errors.

5. Conclusions

The current study scrutinized the experimental data collected by Iwasaki (2000). It was found that the experimentally induced errors show that *ga* has prevalent status in sentence production processes. First, native Japanese speakers exhibit a preference for using *ga* with sentence-initial NPs. Second, *ga* was the most predominantly overused case particle when only argument NPs were considered.

The fact that errors of *ga* were largely limited to argument NPs indicates that the use of *ga* is sensitive to grammatical requirements (e.g., those imposed by selected verbs) and that argument NPs are clearly distinguished from oblique NPs at the Functional Level stage. Furthermore, if verbs with different argument structures are simultaneously activated (either because two sentence plans are simultaneously being made or the target verb has competitors that are semantically closely related), then the likelihood of *ga* errors increased. This indicates that the use of *ga* is tied to grammatical requirements specified in the mental

[8] It is plausible that a participant in this experiment first started to articulate one sentence plan and then changed his/her plan to follow the instructions (that they have to mention all NPs in the picture). However, I consider all first fragments which do not fit well with the rest of the sentences or which are corrected by the speaker to be "errors" in this study. This is because it is difficult to distinguish sentence blends and change of mind (due to experimental instruction or other reasons) and also because I believe that what is first produced is indicative of preferred initial sequences.

lexicon for selected verbs. These findings suggest that *ga* is not an indiscriminate default particle that would become activated for any NP just to satisfy a preference to have an overt subject NP in the sentence, and that *ga* may be better characterized as a default argument marker.

More experimental studies are needed to shed more light on the nature of the defaultness of *ga* as well as case particle selection in Japanese sentence production. This is particularly the case because error frequency depends on the frequency of NP and verb types that speakers produce, which cannot be controlled in natural settings.

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East Asian Languages and Cultures
UC Davis
One Shields Ave.
Davis, CA 95616
USA

niwasaki@ucdavis.edu