

Pseudo-Additivity of Japanese Plurals*

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1 Introduction

Chierchia (1998) distinguishes languages with and without a mass-count distinction. He argues that all nouns are mass in languages without a mass-count distinction such as Japanese and Chinese (classifier languages), and derives some facts from this. One of the facts that attracted much attention is that classifier languages lack obligatory plural marking. It has been argued that the existence of (optional) plural marking in classifier languages challenges Chierchia's analysis (e.g., Chung 2000). Japanese is one such language; it is a classifier language that has an optional plural marker *-tati*. It can attach to proper names, pronouns, and human common nouns. Interestingly, depending on what noun *-tati* attaches to, we get two different interpretations. For instance, when it attaches to a proper name, as in (1), we obtain a group comprised of the individual that *-tati* attaches to and his or her associates (associative reading). In contrast, with a common noun, as in (2), *-tati* yields a group comprised of individuals that have the same property (additive reading).

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- (1) Jun-tati-ga sono biru-o torikakon-da.
 Jun-TATI-NOM that building-ACC surround-PAST
 ‘Jun and his friends/family/classmates surrounded that building.’
- (2) Gakusei-tati-ga sono biru-o torikakon-da.
 student-TATI-NOM that building-ACC surround-PAST
 ‘(The) students surrounded that building.’

The example such as (1) suggests that *-tati* is both semantically and syntactically distinct from plural marking in non-classifier languages (such as English *-s*) that yield only additive interpretations. If we take this view, the existence of optional plural marking in Japanese does not constitute a problem for Chierchia’s analysis as his analysis simply predicts that classifier languages lack additive plural markers and it says nothing about associative plural markers. However, if *-tati* is associative, it raises a question that has been ignored in the literature, namely, the question of how to get an additive reading of an associative plural marker. This paper addresses this exact question. I claim that *-tati* is associative, even in (2), and demonstrate that an associative plural can yield an additive reading (or what I call pseudo-additive reading). That is, I present an analysis of the associative *-tati* where the two distinct interpretations come about from a single meaning.

2 Sometimes Optional Plural Marking in Japanese

2.1 Plural Marking on Common Nouns is Optional

In Japanese, bare common nouns (CNs) have general number, that is, they can be either singular or plural. Moreover, there is no marking on definiteness, and thus bare CNs can be four-way ambiguous, as shown in (3).

- (3) Gakusei-ga ki-ta.
 student-NOM come-PAST
 ‘A student / Students / The student(s) came.’

In case of human CNs, they may be marked as plural by adding the suffix *-tati*, as in (4) (Martin 1975).^{1,2}

¹The suffixes *-ra* and *-domo* can also be used as a plural marker just like *-tati*. In general, CN-*ra* sounds archaic, while CN-*domo* sounds derogatory. For this reason, the use of these suffixes seems to be more restricted than the neutral *-tati*.

²The suffix may be used with inanimate CNs or with non-human animate CNs in order to obtain a figurative effect or to express an attachment. For instance, *neko-tati* ‘cat-TATI’ may be used by someone who adores cats.

- (4) Gakusei-tati-ga ki-ta.
 student-TATI-NOM come-PAST
 ‘(The) students came.’

Unlike (3), (4) permits only the plural interpretation of the subject. More specifically, as clear from the English translation, *gakusei-tati* ‘student-TATI’ in (4) is interpreted as a group comprised of individuals that have the same property, namely, being a student. In the following, I refer to this interpretation as the ADDITIVE reading. What (4) shows then is that English *-s* as well as Japanese *-tati* gives rise to the additive reading. However, they differ in that while *-s* is obligatory when the additive reading is required, *-tati* is only optional. The example in (5) confirms this point.

- (5) Gakusei(-tati)-ga sono biru-o torikakon-da.
 student-TATI-NOM that building-ACC surround-PAST
 ‘(The) students surrounded that building.’

The predicate *to surround that building* requires a plural subject (Dowty 1987, among others). Indeed, it is anomalous to say *The student surrounded that building* because it is impossible to surround that building alone. The corresponding Japanese example in (5) can have either the bare CN *gakusei* ‘student’ or the CN with *-tati* as the subject, which shows that these two expressions permit the additive interpretation.

2.2 Plural Marking on Proper Names is Possible

Another difference between Japanese *-tati* and English *-s* is that *-tati* can appear with proper names (PNs) and refer to a group comprised of the individual of that name and his or her associates. I call this reading the ASSOCIATIVE reading. For instance, *Jun-tati* in (6) refers to Jun and his associates, which are often contextually defined. The most natural interpretation would be people who are closely related to Jun, such as his friends, family, or classmates. The associates do not need to have uniform properties; for instance, the associates may consist of some of his friends and his family members. It is possible to obtain the additive reading in (6), where *Jun-tati* refers to a group comprised of individuals that are all named Jun. This reading of course requires unusual contexts. When English *-s* is used with PNs as in *Juns*, only the additive reading is available.

- (6) Jun-tati-ga ki-ta.
 Jun-TATI-NOM come-PAST
 ‘Jun and his associates came.’
 (or ‘A group of people all named Jun came.’)

Example (7) serves as an additional example of the associative reading. As stated above, *to surround that building* requires a plural subject, hence Jun alone cannot be the subject. With *-tati*, we obtain the associative reading where Jun and his friends, co-workers, etc. were involved.

- (7) Jun*(-tati)-ga sono biru-o torikakon-da.
 Jun-TATI-NOM that building-ACC surround-PAST
 ‘Jun and his associates surrounded that building.’

Table 1 summarizes what we have seen so far. *-Tati* with CNs yields the additive reading just like English *-s*, and *-tati* with PNs yields the associative reading. Note that it is possible to obtain the associative reading with CNs and the additive reading with PNs, but these readings are dispreferred.

General	Singular	Plural
CN <i>gakusei</i> ‘student(s)’		<i>gakusei-tati</i> ‘students’ = additive
PN	<i>Jun</i>	<i>Jun-tati</i> ‘Jun&others’ = associative

Table 1: *-Tati* with CN and PN

2.3 Plural Marking on Pronouns is Obligatory

-Tati can also be used with pronouns, as in (8).

- (8) a. *watasi* b. *anata* c. *kanozyo*
 ‘I’ ‘you’ ‘she’
 a’. *watasi-tati* b’. *anata-tati* c’. *kanozyo-tati*
 ‘we’ ‘you (PL)’ ‘they (FEM)’

What is oft-overlooked is the fact that *-tati* is obligatory on plural personal pronouns. That is, bare pronouns are always interpreted as singular, while pronouns followed by *-tati* are always plural. This can be shown with (9): when the plural interpretation is required, the presence of *-tati* is obligatory.

- (9) a. *Watasi*(-tati)-ga* sono biru-o torikakonda.
 I(-TATI)-NOM that building-ACC surrounded
 ‘We surrounded that building.’
 b. *Anata*(-tati)-ga* sono biru-o torikakonda.
 you(-TATI)-NOM that building-ACC surrounded
 ‘You(PL) surrounded that building.’
 c. *Kanozyo*(-tati)-ga* sono biru-o torikakonda.
 she(-TATI)-NOM that building-ACC surrounded
 ‘They(FEM) surrounded that building.’

It has been independently argued that first and second person plural pronouns are typically associative, while third person plural pronouns are additive (Corbett 2000, Moravcsik 2003). In particular, the first person plural pronoun *we* refers to a group comprised of the speaker and others. Similarly, the second person plural pronoun *you* refers to a group comprised of the hearer and others.³ In contrast, the third person plural pronoun *they* refers to a group comprised of individuals who are neither the speaker nor the hearer. In other words, the group referred to by *they* is comprised of individuals who share the property of not being the speaker nor the hearer, which is the essence of the additive reading.

Table 2 summarizes the data presented in this section. Although *-tati* always yields a plural interpretation when combined with a pronoun, we observe a difference between first and second person plural pronouns on the one hand and the third person plural pronouns on the other: we obtain the associative reading with the former, and the additive reading with the latter.

	General	Singular	Plural
1st		<i>watasi</i> ‘I’	<i>watasi-tati</i> = associative
2nd		<i>anata</i> ‘you’	<i>anata-tati</i> = associative
3rd		<i>kanozyo</i> ‘she’	<i>kanozyo-tati</i> = additive

Table 2: *-Tati* with Pronouns

3 Associative *-Tati* with a Pseudo-Additive Reading

I have shown that *-tati* gives rise to both associative and additive interpretations. Which of the two obtains largely depends on what noun *-tati* attaches to; the associative reading easily obtains with PNs, first and second person pronouns, while the additive reading arises with CNs and third person pronouns.

Following Nakanishi and Tomioka (2004), I assume that *-tati* is always associative. This is confirmed with *-tati* used with a PN, a first person pronoun, or a second person pronouns. However, if *-tati* is associative, a question arises as to how we get an additive reading with CNs and third person pronouns. I argue that the additive reading here is not a genuine additive reading,

³It is unclear whether there is an additive reading for first person plural. An apparent additive reading for first person derives from the fact that the speaker may share space-time co-ordinates and an activity with their associates, i.e. the speaker and associates are doing the same thing at the same time and in the same location. For instance, when people speak in chorus, they are all talking at the same time, but they need a script, so this is not easily obtainable (see Cysouw 2003 for a similar observation). It is less clear whether there is an additive reading for second person plural; I leave this issue to be resolved, noting only that from the addressee’s point of view, second plural must similarly be associative.

but a PSEUDO-ADDITIVE reading that is derived from the meaning of associative *-tati*.

The denotation of *-tati* is given below, which is like Kratzer's (2009) group feature except for the addition of the presupposition that *x* is human.

$$(10) \llbracket -tati \rrbracket^c = \lambda x: x \text{ is human. group}(x)(c)$$

-Tati is a function of type $\langle e, e \rangle$, where it combines with a human individual *x* (of type *e*) and yields a group (of type *e*) that consists of *x* and his/her associate(s) with respect to the contextual parameter *c*. I argue that we obtain either associative or pseudo-additive readings depending on how the associates in the meaning of *-tati* are selected. The members of the group (i.e. *x* and his/her associates) must have something in common – either a descriptive property or a relationship. When a noun that *-tati* combines with has a descriptive property, that property is used to identify the associates. As a result, we obtain a pseudo-additive reading where all members of the group have the same descriptive property. In contrast, when a noun has no descriptive properties, the associates are determined entirely by the context. This yields an associative reading where the members of the group share some contextually salient relationship. Crucially, under the latter reading, there are no descriptive properties shared by the members of the group, and thus the lack of a pseudo-additive reading.

I show below that while PNs, first and second person pronouns have no descriptive properties in their lexical meaning, third person pronouns and CNs do have such properties. Given this difference, our analysis would predict that *-tati* with the former type of nouns yields an associative reading, and that *-tati* with the latter type of nouns gives rise to a pseudo-additive reading. This is exactly what we have observed in section 2. Table 3 summarizes the point.

	N has descriptive properties?	Preferred reading
{PN/1st/2nd}- <i>tati</i>	No	associative
{CN/3rd}- <i>tati</i>	Yes	pseudo-additive

Table 3: Interpretation of *-Tati*

In the following, I demonstrate how the proposed analysis works by applying it to the examples presented in section 2.

3.1 PN-*tati*: Associative

It has been argued that PNs refer rigidly to individuals, that is, PNs have no descriptive content (Kripke 1972). For instance, the denotation of the PN *Jun* is the individual named Jun in the real world. The meaning of *Jun-tati* is derived by combining *-tati* in (10) and *Jun* in (11), as in (12).

$$(11) \quad \llbracket \text{Jun} \rrbracket^c = \text{Jun}$$

$$(12) \quad \begin{aligned} \llbracket \text{Jun-tati} \rrbracket^c &= \llbracket \text{-tati} \rrbracket^c(\llbracket \text{Jun} \rrbracket^c) \\ &= [\lambda x: x \text{ is human. group}(x)(c)](\text{Jun}) \\ &= \text{group}(\text{Jun})(c) \end{aligned}$$

The presupposition that Jun is human is met. “group(Jun)(c)” is read as “a group that consists of Jun and his associates with respect to c”. It is easy to see how this paraphrase corresponds to what we call the associative reading of *-tati*. Let us assume that the context determines what is shared between Jun and his associates (such as the nature of their relationship). For instance, suppose that the speaker is inviting some people to her house, and among the guests, she knows Jun the most. In this situation, the speaker may choose to refer to the guests as *Jun-tati*, meaning Jun and the other guests.

Note that while the PN that *-tati* combines with must be human (hence the presupposition “x is human”), there is no restriction to the associates. To illustrate the point, I provide an example based on a Japanese movie called *Mononoke Hime* ‘Princess Mononoke’. The movie is about a girl who was raised by animals in mountains, and later fought with the animals against humans. In this case, *Mononoke Hime-tati* refers to a group that consists of Princess Mononoke and her associates, namely, the animals in the mountains. In this way, a wide variety of interpretations of associates are possible, and the choice of an appropriate interpretation is completely dependent on the context.

3.2 1st/2nd-tati: Associative

We now turn our attention to pronouns. Following Kratzer (2009), I assume that first and second person pronouns are referential and that first and second person features refer to the speaker(s) and the hearer(s) of type *e*, as shown in (13).

$$(13) \quad \begin{array}{ll} \text{a. } \llbracket [1\text{st}] \rrbracket^c &= \text{the speaker(s) in } c \\ \text{b. } \llbracket [2\text{nd}] \rrbracket^c &= \text{the hearer(s) in } c \end{array} \quad (\text{Kratzer 2009: 220})$$

The features in (13) are number neutral, and thus a number feature is needed to specify its singularity or plurality. As illustrated in section 2.3, Japanese first and second person pronouns are singular, which means that they come with the number feature [singular]. I here adopt Kratzer’s (2009) denotation in (14).

$$(14) \quad \llbracket [\text{singular}] \rrbracket^c = \lambda x: x \text{ is an atom. } x \quad (\text{Kratzer 2009: 225})$$

It follows then that the first person singular pronoun *watasi* ‘I’ consists of two features, namely, the first person feature and the singular feature, as shown in (15).

$$(15) \llbracket watasi \rrbracket^c = \llbracket [\text{singular}] \rrbracket^c (\llbracket [1\text{st}] \rrbracket^c) = \text{the speaker in } c$$

As discussed in section 2, an associative reading is dominant when first (or second) person pronouns are followed by *-tati*. This is predicted in the current proposal. When *-tati* combines with *watasi* ‘I’, as in (16), we obtain a group that consists of the speaker in *c* and his or her associates with respect to *c*.

$$(16) \llbracket watasi-tati \rrbracket^c = \text{group}(\text{the speaker})(c)$$

Since *watasi* ‘I’ is referential and thus lacks descriptive properties, we expect to see only an associative reading. As with the case of *-tati* with PNs, what is shared between the speaker and his or her associates is determined by the context.⁴

3.3 3rd-*tati*: Pseudo-Additive

According to Kratzer (2009), third person pronouns are definite descriptions that are composed of a descriptive gender feature in (17) and a definite determiner in (18). The definite determiner is a function that maps properties of individuals to the maximal individual that has the property.

$$(17) \text{ a. } \llbracket [\text{male}] \rrbracket^c = \lambda x. x \text{ is one or more males} \\ \text{ b. } \llbracket [\text{female}] \rrbracket^c = \lambda x. x \text{ is one or more females} \quad (\text{Kratzer 2009: 221})$$

$$(18) \llbracket [\text{def}] \rrbracket^c = \lambda P_{\langle e, t \rangle}. \sigma x P(x) \quad (\text{Kratzer 2009: 221})$$

For example, we may assume that the denotation of *kanoz̄yo* ‘she’ is derived from combining the definite determiner with the female gender feature, as shown in (19).

$$(19) \llbracket kanoz̄yo \rrbracket^c = \llbracket [\text{def}] \rrbracket^c (\llbracket [\text{female}] \rrbracket^c) = \text{the unique female(s) in } c$$

⁴It is unclear whether there is a pseudo-additive reading for first person plural. An apparent pseudo-additive reading for first person derives from the fact that the speaker may share space-time co-ordinates and an activity with their associates, i.e., the speaker and associates are doing the same thing at the same time and in the same location. For instance, when people speak in chorus, they are all talking at the same time, but they need a script, so this is not natural language. (See Cysouw 2003 for a similar observation.) It is less clear whether there is a pseudo-additive reading for second person plural; I leave this issue to be resolved, noting only that from the addressee’s point of view, second person plural must similarly be associative.

As is, *kanozyo* ‘she’ is expected to have both singular and plural interpretations, which is empirically incorrect; *kanozyo* refers to a singular individual without the presence of *-tati* (see section 2.3). As shown above, the same observation holds for first and second person pronouns, and I proposed that they have a singular feature in (14). Extending this proposal, I assume that *kanozyo* also comes with a singular feature. Syntactically, the singular feature sits at the position above the node where the definite determiner and the gender feature combine. It follows then that the singular feature should be added to (19), as in (20).

$$(20) \llbracket kanozyo \rrbracket^c = \llbracket [\text{singular}] \rrbracket^c (\llbracket [\text{def}] \rrbracket^c (\llbracket [\text{female}] \rrbracket^c)) \\ = \text{the unique female in } c$$

The denotation of the third person plural pronoun *kanozyo-tati* ‘she-TATI’ is given in (21).

$$(21) \llbracket kanozyo-tati \rrbracket^c = \text{group}(\text{the unique female})(c)$$

As a result, *kanozyo-tati* refers to a group that consists of the unique female and her associates with respect to the context. When searching for a shared property between the unique female and her associates, we notice that third person pronouns differ from other nouns that we have seen so far, namely, PNs, first and second person pronouns. More specifically, the former, but not the latter, have a descriptive property in their denotation (namely, a descriptive gender feature in (17)). I argue that this lexically-specified property takes precedence over any other shared property that may be found in the context. As a result, we obtain a pseudo-additive reading where the associates have the same gender as the third person singular pronoun (e.g., in the case of *kanozyo-tati* ‘she-TATI’, all the members are female).

In this way, with third person pronouns, the lexical meaning of the pronouns determines what is shared between the unique male or female and his or her associates (i.e., their shared property in (17)). Regarding a non-preferred associative reading, I propose that this reading arises if associates are chosen without exploiting the descriptive content of a pronoun. That is, although the lexical meaning of pronouns determines the primary interpretation of *-tati*, there may be overriding factors; in some contexts, we may obtain the associate reading that involves a group of a representative male/female and his/her associates when there is a salient male/female individual in the context. For example, recall the scenario with *Mononoke Hime* ‘Princess Mononoke’, discussed in section 3.1. In this case, *kanozyo-tati* can be easily interpreted as referring to Princess Mononoke and her associates who are not females.

3.4 CN-*tati*: Pseudo-Additive

Finally, let us discuss the plurality of CNs. I simply follow the general assumption here that CNs denote properties of individuals. As stated in section 1, in Japanese the denotation of CNs include both singular and plural individuals (Chierchia 1998, cf. Borer 2005). For example, the CN *gakusei* ‘student’ has the denotation in (22) of type $\langle e, t \rangle$.

$$(22) \llbracket \textit{gakusei} \rrbracket^c = \lambda x. x \text{ is one or more students}$$

Let us now examine the meaning of CN-*tati*. The denotation of *-tati* is repeated in (23), which is of type $\langle e, e \rangle$.

$$(23) \llbracket \textit{-tati} \rrbracket^c = \lambda x: x \text{ is human. group}(x)(c) \quad (= (10))$$

Assuming that the meaning of *-tati* is uniform regardless of which noun it combines with, there is a type-mismatch between a CN and *-tati*. A well-established remedy for such a case is to apply a type-shifting rule (Partee 1987, Chierchia 1998, among others). I show how this approach works with *gakusei-tati* ‘student-TATI’. I first examine the case where two or more students are involved. Suppose that there are two students in the context, namely, Ann and Beth. The denotation of *gakusei* is a set of individuals that includes both singular and plural individuals, as in (24a) (\cup_1 is an individual sum operator in the sense of Link 1983). As a type-shifting rule, I posit the iota operator that combines with a set of individuals, and returns the largest member of that set. If the set lacks such an individual, the result is undefined. In our case, there is a unique largest individual, namely, $\text{Ann} \cup_1 \text{Beth}$, thus the denotation of *gakusei* after applying the iota operator is (24b). *-Tati* in (23) takes (24b) as an argument, which yields (24c), namely, a group that consists of $\text{Ann} \cup_1 \text{Beth}$ and their associates with respect to the contextual parameter c .

$$(24) \begin{array}{l} \text{a. } \llbracket \textit{gakusei} \rrbracket^c = \{ \text{Ann}, \text{Beth}, \text{Ann} \cup_1 \text{Beth} \} \\ \text{b. } \llbracket \textit{gakusei} \rrbracket^c = \text{Ann} \cup_1 \text{Beth} \\ \text{c. } \llbracket \textit{gakusei-tati} \rrbracket^c = \text{group}(\text{Ann} \cup_1 \text{Beth})(c) \end{array}$$

Since $\text{Ann} \cup_1 \text{Beth}$ is a plural individual that has a descriptive property of being a student, this lexical information is used to determine what is shared between $\text{Ann} \cup_1 \text{Beth}$ and their associates. As a result, they all share the property of being a student, which amounts to a pseudo-additive reading.

I now consider the case where there is only one student involved, say, Ann. The denotation of *gakusei* ‘student’ then is a set of individuals that contains Ann as the only member, as shown in (25a). By applying the iota operator, we obtain the largest individual in the set, namely, Ann, as in (25b). The

denotation of *gakusei-tati* is given in (25c), which refers to a group that consists of Ann and her associates with respect to c.

- (25) a. $\llbracket \textit{gakusei} \rrbracket^c = \{\textit{Ann}\}$
 b. $\llbracket \textit{gakusei} \rrbracket^c = \textit{Ann}$
 c. $\llbracket \textit{gakusei-tati} \rrbracket^c = \textit{group}(\textit{Ann})(c)$

Just like in (24), the descriptive property is used as a shared property between Ann and her associates, which again yields a group of students.

Note that the analysis presented here does not preclude an associative reading of CN-*tati*. As discussed in section 3.3, I submit that the lexical meaning of the noun that *-tati* attaches to is given a priority when deciding what is common between that noun and its associates. However, this is merely a priority, and thus can be overridden when there are other salient shared properties between the two. For example, we may encounter a group of people of different backgrounds, and the representative of the group may happen to be a student. It is perfectly natural to refer to this group as *gakusei-tai* ‘student-TATI’.

4 Conclusion

In sum, going back to the question raised in section 1 of the typology of plural markers in different languages, the current work on Japanese *-tati* confirms Chierchia’s (1998) prediction that classifier languages lack additive plural markers. The claim I made is rather simple and straightforward: *-tati* is always an associative plural. This claim itself is not new (see Nakanishi and Tomioka 2004, among others), but what is novel is the observation that *-tati* gives rise to an additive (or what I call pseudo-additive) as well as an associative reading. Particularly important is the observation that the associative *-tati* has a (pseudo-)additive reading with third person pronouns and with CNs. Also novel is the analysis where the two distinct interpretations come about from a single associative meaning of *-tati*. I argued that third person pronouns and CNs are different in that they come with descriptive properties, which are used to determine their associates. In this way, the proposed analysis allows us to derive (pseudo-)additive readings without making any additional assumptions; the desired interpretation naturally follows from the associative *-tati* and the semantics of nouns that *-tati* combines with.

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