ON CASE ALTERNATION PHENOMENA: A CATEGORIAL APPROACH

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ABSTRACT

In Japanese potential and *tough* constructions, arguments standing in various semantic relations to a base verb can be marked with nominative case. Such subjects also may show up with genitive case in nominalizations irrespective of their semantic relations. This paper, addressing a variety of case alternations which have not hetherto attracted much attention from theoretical linguistics, proposes within the categorial framework that case alternations can be accounted for in terms of the applicability of a type shift rule introducing gaps into predicatephrases and the composition rule which combines base verbs with higher stative predicates passing the information about gaps up to the result categories.

0. INTRODUCTION

In this paper, we propose a completely new analysis concerning nominative and genitive marking in Japanese stative clauses in the categorial framework. Its aim is twofold: to examine a wider range of data than has done in the past, and to provide a unified account of the phenomena called case alternations in Japanese. Let us begin with an overview of data.[1] I add the semantic roles of the arguments showing case alternations to each of the examples:

(1) a. Tanaka-ga sakana-ga/-o tabe-rare-nai-koto (theme)
Tanaka-NOM fish-NOM/-ACC eat-can-Neg-fact
'the fact that Tanaka cannot eat fish.

b. kono boorupen-ga/-de hagaki-o kaki-nikui-koto (instrumental)
this boll-point-pen-NOM/with postcard-ACC write-difficult-fact
'the fact that it is difficult to write a postcard with this boll-point pen'

c. Yamada-no ie-ga/-kara daigaku-ni tuugaku-si-yasui-koto (starting point)
Yamada-GEN house-NOM/-from college-to go-easy-fact
'the fact that it is easy to go to college from Yamada's house'

d. tihoo-gakkai-ga/-notameni jugyoo-ga yasum-e-nai-koto (reason)
local meeting-NOM/because-of class-NOM skip-can-Neg-fact
'the fact that we cannot skip a class because of meetings of the local society'

e. kono jitensya-ga/-no taia-ga kookan-si-yasui-koto (possessor of theme)
this bicycle-NOM/GEN tire-NOM change-easy-fact

[1] I add the formal noun *koto* 'fact' to example sentences throughout this paper. When the stative predicate expresses the property of an individual denoted by the subject that are permanent or relatively stable, the subject should be marked with the topic marker *-wa*, as in *kono boorupen-wa kaki-nikui* 'it is difficult to write with this ball-point pen' and if it is marked with nominative case, it receives the exhaustive-listing reading (see Shirai 1985). When it is embedded in the nominalization context, as in (1), the interpretation becomes ambiguous between the exhaustive-listing and neutral-description (Kuno 1973).

'the fact that it is easy to change tires of this bicycle'

f. kono biru-ga/-no 2-kai-de syokuji-ga dekiru-koto (possessor of locative phrase)
this building-NOM/GEN second-floor-on meal-NOM do-can-fact
'the fact that you can have a meal on the second floor of this building'

The nominative NPs in (1) may show up with genitive case (*Ga-No* conversion) in nominalized expressions headed by *koto* or *no* 'fact' or in relative clauses.[2]

(2) a. Tanaka-no sakana-no tabe-rare-nai-koto (theme)
Tanaka-GEN fish-GEN eat-can-Neg-fact

b. kono boorupen-no hagaki-no kaki-nikui-koto (instrumental)
this boll-point-pen-GEN postcard-GEN write-difficult-fact

c. Yamada-no ie-no daigaku-ni tuugaku-si-yasui-koto (starting point)
Yamada-GEN house-GEN college-to go-easy-fact

d. tihoo-gakkai-no jugyoo-no yasum-e-nai-koto (reason)
local meeting-GEN class-Nom skip-can-Neg-fact

We find another kind of case alternation, *Ni-Ga* (dative-nominative) alternation with the experiencer argument in potential constructions, as in simplex sentences including some of the psych predicates, and they may be marked with genitive case in nominalizations.

(3) a. Taroo-ni/-ga/-no eigo-ga hanas-e-nai-koto
Taroo-DAT/-NOM/-GEN English-NOM speak-can-Neg-fact
'fact that Taroo cannot speak English'

b. Taroo-ni/-ga/-no eigo-ga wakara-nai-koto
Taroo-DAT/-NOM/-GEN English-NOM understand-Neg-fact
'the fact that Taroo does not understand English'

We attempt to propose a unified account of all these case alternation phenomena within the categorial framework. In Section 1, I will sketch some background assumptions in the categorial grammar. Section 2 deals with nominative marking of various arguments of base verbs as observed in (1) and argue that it is made possible via a rule introducing gaps into predicate phrases and concatenation of base verbs and the matrix suffix *-(rar)e* or the adjectives such as *-yasui* 'easy' or *-nikui* 'difficult' by function composition. Section 3, following the property theory proposed by Chierchia (1984, 1985), proposes a mechanism by which nominative NPs with various semantic roles can be marked with genitive case. In section 4, we will discuss some of the consequences of the analysis and extend our approach to case alternations observed in simplex stative clauses.

1. BACKGROUND ASSUMPTION

Though categorial grammars have a long tradition in theoretical linguistics, they have been rapidly made progress in recent years, and there is still no framework which all grammarians share in detail. Adopting as a descriptive framework Combinatory Categorial Grammar, CCG, proposed by Steedman (1985, 1987, 1991, 1996), I briefly outline some principles and concatenative rules relevant to the present concerns.

CCG analyzes only surface strings of natural language, avoiding descriptive devices such as movement or deletion rules, abstract levels of representation, and empty categories. Combinatory rules may only apply to entities which are linguistically realized and adjacent, building up expressions from words to larger expressions. The modes of combination of expressions are entirely determined by lexical syntactic types, which specify semantic valency and canonical constituent order, and nothing else. For example, the verb *eat* in English has the category assignment in (1):

(4) eats := $(S/_{L}NP)/NP$

The diagonal 'slash' operators encode restrictions on word order. The notation adopted here observes the convention that the argument symbol is always to the right of the slash and the result symbol is to the left, no matter which order function and argument combine in. A forwards slash / indicates that the function takes an argument on the right, and a backslash, notated as '$/_{L}$' in this paper, indicates the function looking for an argument on its left. The category of *eats* indicates that it is a function that seeks an NP argument

[2]In this paper I concentrate on *Ga-No* conversion in nominalizations with *koto* 'fact' to maintain the parallelism between nominative and genitive marking in the same context.

(i.e., the object) on its right to form a verb phrase of category $S/_LNP$, and then seeks an NP argument (i.e., the subject) on its left to form an S. I introduce only three combinatory rules in (5) relevant for the present discussions.

(5) a. $X/Y{:}f \quad Y{:}a \Rightarrow X{:}fa$ $\qquad$ $Y{:}a \quad X/_LY{:}f \Rightarrow X{:}fa$

b. $X/Y{:}g \quad Y/Z{:}f \Rightarrow_B X/Z{:}gf$ $\qquad$ $Y/_LZ{:}f \quad X/_LY{:}g \Rightarrow_B X/_LZ{:}gf$

c. $X{:}a \Rightarrow_T T/_L(T/X)$ $\qquad$ or $\qquad$ $T/(T/_LX)$: $\lambda f.fa$

(5a) is the rule of function application. A function of category X/Y combines with an adjacent argument of category Y to yield a result of category X and interpretation *fa*, the result of applying *f* to *a*. This rule, for example, combines a transitive verb with an object to yield the verb phrase, and then, combines the verb phrase with a subject to produce the sentence. The rule of function composition (5b) allows the main function of category X/Y to combine with the subordinate function of category Y/Z to yield a function of category X/Z. (5c) is the rule of type-raising, which for present purposes is confined to subject NPs. This operation converts a subject NP, which would normally be an argument to a verb phrase of category $NP/_LS$, into a function looking forward for a verb phrase to produce a sentence, $S/(S/_LNP)$. In order to see how the rules in (5b) and (5c) interact, consider the case of topicalization here, as in (6):

(6) Mary, John loves

$$\frac{NP_{Obj} \quad \underline{NP_{Subj\,T} \quad (S/_LNP)/NP}}{\dfrac{S/(S/_LNP)}{S/NP_{Obj}}\,{<}B}$$

In (6), *loves* of category $(S/_LNP)/NP$ cannot combine with the object because the object *Mary* is preposed. Thus, it has to combine with the subject *John* by function composition, which is type-raised into the function taking the verb phrase as argument. The resulting expression *John loves* of category $S/_LNP_{Obj}$ finally combines with the topic *Mary*. In what follows, we use the generalized composition (Steedman 1996:35) in order to deal with combinations of higher functions:

(7) $X/Y{:}f \quad (Y/Z)/\${:}\ \ldots \lambda z.gz \ldots \Rightarrow_B (X/Z)/\${:}\ \ldots \lambda z.f(gz\ldots)$

The \$ notation stands for the remainder. X/\$ is thus a variable ranging over the set which includes X and all functions into X.

Observing a close parallel traditionally maintained between syntax and semantics, we spell out semantic interpretations using italics following a colon, as in *eat* := $(S/_LNP)/NP$: $\lambda x.\lambda y.eat'(x)(y)$. Here I will briefly explain the category symbols used below. The symbol S stands for clauses, to which I add the features such as *fin* (finite) or *stat* (stative) indicated by the subscripts since these features influence the nominative marking of arguments. Since all noun phrases, whether arguments or adjuncts, must be followed by one of postpositions in Japanese, I use 'TP' (term phrase) as a cover term for all postpositional phrases, with the subscripts indicating semantic roles and with the superscripts indicating cases, as in $TP^{Obl}{}_{Inst}$ (a instrumental argument marked with oblique case). The category VP is assigned to tenseless clauses (infinitives). I introduce other assumptions as this paper proceeds.

2. NOMINATIVE MARKING AND CASE ALTERNATIONS

2. 1. Nominative Marking of Arguments, Adjuncts and Possessors in Embedded Clauses

It has been widely assumed that the notion of tense is crucially involved in nominative marking in Japanese (see Takezawa 1987, Fukui and Nishigauchi 1992, Morikawa 1993, among others). Recasting it under the present framework with no rule directly involving discontinuous constituents, a possible way to license a nominative noun phrase is by it being adjacent to a predicate phrase headed by a finite verb/suffix/adjective. Besides, since it is well known that there may be multiple nominative NPs in stative clauses, we state the licensing condition for nominative marking as in (8) using the \$ notation:

(8) Multiple subjects may be allowed to occur in stative clauses, if they are adjacent to constituents of category $(S_{fin.stat}/_LTP)/_L\$$.

It should be noted here that the licensing condition (8) does not state that all TPs must be marked with nominative if they are adjacent to expressions of $(S_{fin.stat}/_LTP)/\$$. Any argument adjacent to them may show up with inherent case markers, as shown in the examples in (1).

Let us begin with the nominative object in potential constructions. In the generative literature, it has been accounted for by assuming that restructuring optionally applies to a base verb and the potential suffix *-(rar)e* to absorb the case-assigning feature of the verb, and thus, the nominative object should move up to the position where its case can be licensed (the targets of this movement varies among authors)(see Tada 1992, Inoue 1988, Koizumi 1994, Ura 1999, among others).

(9) Tanaka-ga sakana-ga$_i$ [t_i t_j] tabe$_j$-rare-nai-koto (theme)
↑_____| |_____↑ optional verb raising and case absorption.

Such accounts, limiting themselves to the nominative object, cannot explain a wide variety of case alternation phenomena we observed in (1) and (2) because inherent cases (contra structural cases) in principle cannot be absorbed and adjuncts cannot directly move up to the subject position. Moreover, the examples in (10) show that the external argument of base verbs are not suppressed in potential constructions, which also casts doubt on the case absorption approach. In (10a) involving the subject honorific verbal form, *sensei* 'teacher' is always the person whom the speaker considers to be most worthy of respect, irrespective of whether it is marked with nominative or dative, as opposed to the passive case in (11), where the agent of the base verb is suppressed and the derived external argument *okusama* 'wife' becomes the person for whom the speaker has a respect. As in (10c), the subject oriented anaphor *zibun* 'self' may freely occur in potential constructions, irrespective of what semantic role the subject has, always bound by the agent (in (13b), possibly some customers) of base verbs.

(10) a. Sensei-ga okusama-o o-sikari-ni-nar-e-nai
teacher-NOM wife-ACC HON-scold-CAN-NEG
'Teacher cannot scold his wife.'

b. Sensei-ni okusama-ga o-sikari-ni-nar-e-nai
teacher-DAT wife-NOM HON-scold-CAN-NEG

c. Kono hootyoo-wa ookina-sakana-o go-jibun-de o-sabaki-ni-nar-e-masu.
this kitchen-knife-TOP big-fish-ACC HON-SELF-by HON-cook-CAN-PRES
'You can cook even a big fish with this kitchen knife.'

(11) a. Sensei-ga okusama-o o-sikar-ni-natta.
teacher-NOM wife-ACC HON-scold-PAST
'The teacher scolded his wife.'

b. Sensei-ni okusama-ga o-sikar-are-ni-natta.
teacher-BY wife-NOM HON-scold-PASS-PAST

Assuming that case absorption tightly correlates with the suppression of an external argument, we cannot explain the nominative object in (10) in the same way as in the passive case of (11). This fact, together with the inability to account for a variety of case alternations in (1), shows that the case absorption approach is completely untenable.

Though the structures of lower clauses are different, the potential and *tough* constructions share the property that they allow any argument or adjunct of an embedded clause to be the matrix subject.[3] Thus, as far as the nominative marking of a variety of arguments, they should involve the analogous process of derivations. In this paper, we assume that both constructions have the null operator structure in the terminology of generative grammar. The structure of (1b) can thus be illustrated as in (12b), where the trace t_i occupies an adjunct position of a lower clause):

(12) a. kono boorupen-ga hagaki-o kaki-nikui-koto

b. [[kono boorupen-ga][$_{AP}$[$_{CP}$ Op$_i$ [$_{IP}$ [$_{VP}$ PRO [$_{V'}$ t_i [$_{V'}$ hagaki-o kaki] nikui]]]

Within the framework of CCG, unbounded dependencies as in *wh*-movement or null operator structures are treated by function composition. The information about a missing argument, which was not introduced in the normal way, is passed up from a subordinate function to the composed function.

Before presenting concrete derivations, apart from *wh*-movement, we have to distinguish at least the two kinds of unbounded dependency constructions in Japanese, as shown in (13):

(13) a. kono hootyou-de syosinsya-ni-mo yasai-ga kir-eru-koto
this kitchen-knife-with beginners-DAT-EVEN vegetables-NOM cut-CAN-fact

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[3]The potential suffix subcategorizes only transitive and unergative base verbs, while *tough* adjectives take any verbal forms including passives (*Ano bokusaa-ga ut-are-nikui*. 'That boxer is difficult to hit'). Besides, the postposition *ni-totte* is preferred to indicate the experiencer of *tough* adjectives (or the agent of base verbs) in *tough* constructions.

'Even beginners can cut vegetables with this kitchen knife.'

b. kono hootyou-ga syosinsya-ni-mo yasai-ga kir-eru-koto
this kitchen-knife-NOM beginners-DAT-EVEN vegetables-NOM cut-CAN-fact

In (13a) scrambling simply moves the instrumental argument to the sentence initial position, but the oblique case marker *de* 'with' shows that the syntactic relation between the instrumental argument and the base verb is maintained and, it has the same meaning as the corresponding expression without scrambling. In (13b), on the other hand, the instrumental argument is the matrix subject which fails to indicate any morpho-syntactic relation with the base verb. Semantically, (13b) predicates the property of the entity denoted by the subject *kono hootyoo*. As will be shown in Section 5, these two constructions show the difference in scope interpretation. Though the notion of syntactic conectivity, which has long been the focus of debate in the literature (see Jacobson 1992; Bayer 1990; Hukari and Levine 1991; Steedman 1996 among others), is crucially involved in the two kinds of dependencies in (13), I do not have the space to go into such vexed questions in the present discussion aiming at a descriptive generalization concerning case alternations in Japanese. For now let us assume that the scrambled adjunct and its gap in (13a) exhibit syntactic connectivity, whereas the nominative adjunct and its gap in (13b), displaying case mismatch, lack such connectivity. To distinguish the two types of gaps in (13), I notate the extraction site in scrambling as the usual slash, and the missing argument in a null operator structure as '|TP', which I borrow from Jacobson's (1999) notation.[4] Again I indicate the semantic role of the missing argument/adjunct by subscripts, as in $|TP_{instrument}$, but it bears no specification of case. Because the information about a gap is transmitted from a lower clause to a matrix sentence through derivations via composition, the matrix predicate phrase would be of category $S_{fin}|TP_{\alpha}$. The subject in these constructions is taken to be of category S/(S|TP), which indicates that it should be associated with a gap in a predicate phrase. The association of the subject and its gap is not carried out syntactically, but semantically or pragmatically (Jacobson (1992) proposes a meaning postulate for the association between the filler and gap in *tough* constructions). As supporting evidence for lack of syntactic connectivity, consider (14):

(14) Yuugata-ni-wa reddo-heddo-ga yoku tur-eru.
evening-in-TOP read-head-NOM well catch-fish-CAN-PRES

Those who do not enjoy fishing will take *reddo-head*, the lure with its head painted red, to be the theme of the base verb *tur*, but anglers using lures can easily associate it with the gap in a instrumental adjunct position. In a passive clause of the form X-*ga* V-*rare-ru*, X must be the theme of V even if we do not know what X stands for, whereas any argument can be the subject of potential and *tough* constructions in Japanese, which suggests that the relationship between the subject and the gap is not morpho-syntactic but semantic/pragmatic.[5]

Note that having a gap (|TP) in an embedded clause and thus, in a derived matrix VP is a lexical property of the potential suffix or *tough*-type adjectives. Non-stative sentences and some of apparently stative sentences (such as control sentences) do not allow adjuncts or possessors to become the matrix subjects. Also note that, since multiple subjects show up in the potential/*tough* constructions, the matrix VP may contain multiple gaps corresponding to the subjects. So the category of such predicates will be of $S|TP_{\alpha 1}...|TP_{\alpha n}$. Though each association of a subject and a gap will refer to a version of thematic hierarchy, it is essentially carried out semantically and/or pragmatically.

From now on, let us consider some concrete examples. First, take the example (1a), repeated

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[4]To deal with unbounded dependency in quantification, Jacobson's (1999) proposes the type shift rule shifting an expression of category (A/B)/C... to (A|C)/B ..., and as to long-distance extraction, an item of category (S/...)/S can shift to ((S|A)/...)/(S|A), where the extraction gap feature is passed from S node to result S node. If we adapt this kind of type shift to potential and *tough* predicates, their category may be of $(S|TP_{\alpha})/TP_{Exp}.../(VP|TP_{\alpha})...$(where α indicates a semantic role which the gap bears), and we can attribute case alternation phenomena to the type shifting of the suffix/adjective, but we present derivations involving function composition for expository convenience.

[5]Nevertheless, it should be noted that we somehow need to introduce a gap/gaps into the predicate phrases in these constructions. If all arguments of a predicate are saturated, the reslt must be a proposition, not a propositional function which can be predicated over the property of the entity that the subject denotes.

We assign the semantic type <e,t> to an item of category $S|TP_{\alpha}$, functions from individuals to propositions, as in the standard verb phrases.

below, which shows the nominative/accusative alternation of the object.

(15) a. Tanaka-ga sakana-o tabe rareru

$$\frac{\dfrac{\dfrac{TP_{Exp}\quad TP_{Th}\quad VP/_L|TP^{Acc}{}_{Th}}{VP{:}\,tabe'(sakana')}<\quad (S_{fin}/TP_{Exp})/_L VP}{S_{fin}/_L TP_{Exp}{:}\ \lambda x.tabe' \circ rareru'(sakana')(x)}<}{S_{fin}{:}\ tabe' \circ rareru'(sakana')(Tanaka')}$$

b. Tanaka-ga sakana-ga tabe rareru

$$\frac{\dfrac{\dfrac{TP_{Exp}\quad S/(S|TP)\quad VP|TP_{Th}\quad (S_{fin}/TP_{Exp})/_L VP}{(S_{fin}|TP_{Th})/_L TP_{Exp}{:}\ \lambda x.\lambda y.tabe' \circ rareru'(x)(y)}<B}{S_{fin}/_L TP_{Exp}{:}\ \lambda y.tabe' \circ rareru'(sakana')(y)<}}{S_{fin}{:}\ tabe' \circ rareru'(sakana')(Tanaka')}$$

Functional composition of two functions f and g is commonly written as '$f \circ g$' (=$f(g(x))$), and we reverse the order of main and subordinate functions to reflect the stem-suffix order of Japanese complex predicates. We leave the case marking of the experiencer to the next section, concentrating on the case alternation of the theme. In (15a), the base verb *tabe* 'eat' and the object *sakana-o* 'fish' are concatenated via usual application to produce the embedded VP, which is combined with *rare* via the same process. In (15b), on the other hand, the base verb first composes with the potential suffix by (7), encoding the information about the missing object on the output, i.e., the complex verb *tabe-rare* 'can eat', which takes the nominative object as argument.

From now on, we will omit the derivations in which the arguments, adjuncts or possessors show up with their original case assigned by base verbs, because they are canceled in the normal way (by application), and present only the derivation in which they are marked with nominative case. We also omit the experiencer arguments from the derivations below to discuss them in the next section, and introduce *one'* into the interpretations to indicate an experiencer with an arbitrary interpretation.[6] Next, observe the derivation of (1b) with the adjunct marked with nominative case, which will be illustrated as in (16):

(16) kono booru-pen-ga hagaki-o kaki nikui

$$\frac{\dfrac{\dfrac{S/(S|TP_{Inst})\quad TP^{Acc}{}_{Th}\quad (VP|TP_{Inst})/_L TP_{Th}<\quad S_{fin}|VP}{VP|TP_{Inst}{:}\ \lambda y.kaku'(hagaki')(one')(with\text{-}y)}<B}{S_{fin}|TP_{Inst}{:}\ \lambda y.kaki' \circ nikui'(hagaki')(one')(with\text{-}y)<}}{S_{fin}{:}\ kaki' \circ nikui'(hagaki')(one')(with\text{-}boorupen')}$$

We assume, following Steedman (1996:41, 77), that adjuncts are also subcategorized by verbs in some sense and that they are the most oblique (and optional) arguments of verbs. In (16b), the missing instrumental argument of the base verb becomes a feature encoded on the category of the infinitive, as in $VP|TP_{Inst}$, which is passed up to the final result predicate phrase through the derivation, and some semantic/pragmatic predication rule will link the subject *kono boorupen-ga* and the gap in the predicate phrase. Note here that the matrix VP in (16b) is of category $S|TP_{\alpha}$ and of type <e,t>, as in normal VPs (intuitively in (16), denoting the set of individuals with which it is difficult to write a card).

Let us turn to the nominative marking of the possessor of an embedded argument, as in (1e) and (1f). The derivation of (1e) with the nominative possessor can be shown as in (17):

[6]When an argument is deleted by 'Argument Drop' (Chierchia 1984, Jacobson 1992), the position of the deleted

(17) kono jitensya-ga taia-o kookan-si yasui

S/(S|TP_{Pos}) $TP_{Th}|TP_{Pos}$ $VP/_{L}TP^{Acc}_{Th}$ <B $S_{fin}/_{L}VP$

$VP|TP_{Pos}$: $\lambda x.kookan\text{-}si'(\boldsymbol{poss}(taia')(x))(one')$ <B

$S_{fin}|TP_{Pos}$: $\lambda x.kookan\text{-}si' \circ yasui'(\boldsymbol{poss}(taia')(x))(one')$ <

S_{fin}: $kookan\text{-}si' \circ yasui'(\boldsymbol{poss}(kuruma')(banpaa'))(one')$

Space precludes a discussion of the internal structure of noun phrases, but notice here that the cateogry $TP/_{L}TP$ (a function from individuals to individuals) is assigned to nouns referring to a part of an entity, not a whole entity, such as *taia* 'tire'. When the possessor is marked with genitive case, it combines with the possesee TP to yield *kono jitensya-no taia* 'the tire of this bicycle'. In (17b), on the other hand, the information of the missing possessor as a feature $|TP_{Pos}$ is passed up via the iterative application of composition from the object TP to the final result category of the matrix predicate, which, intuitively, refers to the entities the tires of which are easy to change.

In this section, we propose that the predicate phrases of potential and *tough* constructions are assembled by function composition, carrying over the information about gaps in embedded clauses. This view uniformly accounts for all the case alternation phenomena observed in (1) with no new tricks invoked. Because the subcategorization for an infinitive including a gap is a lexical property of the potential suffix and *tough*-type adjectives, the function composition analysis can not be generalized to other non-stative verbs and some of stative predicates which does not allow to arguments other than the object to be marked with nominative (i.e., which have no gaps in their predicate-argument structure).

2. 2. Dative-Nominative Case Alternation

Let us turn to the alternation between dative and nominative case in potential constructions. This case alternation shows the properties slightly different from those discussed so far. First, consider whether the dative marked argument is the experiencer of the suffix *(rar)e* or the agent of base verbs. If it is the agent of a base verb (as in the causative or indirect passive constructions), the analysis proposed in 2. 1 also holds for the *ni-ga* alternations. It has been argued in the literature, however, that the dative argument occupies a higher position than other arguments. Consider:

(18) $Yamada_{i}$-ni [$jibun_{i}$-no kimoti]-ga syoojiki-ni hanas-e-nai-koto
Yamada-DAT self-GEN feeling-NOM frankly talk-CAN-NEG-fact
'the fact that Yamada cannot talk about his feelings frankly'

It has been argued that the fact that the dative NP can antecede the subject-oriented anaphor in the nominative object indicates that it really has the status of subject and that its position is higher than that of nominative NPs (see Ura 1999, Takezawa and Whitman 1998 for relevant discussions). Assuming, though, that the phenomena such as reflexivization and honorification are sensitive to the argument structures of predicates, not to the surface case marking or configurational hierarchy, the antecedent-anaphor relation in (18) at most suggests that the dative NP is an external argument of the higher suffix and/or a controller of the agent of the base verb.

Nevertheless, the fact that some simplex psych-predicates show similar case arrays seems to lead us to acknowledge that the suffix *(rar)e* in fact subcategorizes for this dative argument.

(19) $Yamada_{i}$-ni [$jibun_{i}$-no kimoti]-ga yoku wakaru.
Yamada-DAT self-GEN feeling-NOM well understand
'Yamada understands his feeling well.'

As will be touched on Section 4, the noun phrases marked with original cases and those marked with nominative case display different behaviors with respect to scope interpretation. The *ni-ga* alternation, however, does not affect scope interpretation, which appears to indicate that the dative NP is an argument of the matrix predicate *(rar)e*.

(20) a. hahaoya-dake-ni kodomo-ga sodate-rareru-koto
mother-only-DAT child-NOM grow.up-CAN-fact
'It is only mothers that can bring up children.'

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argument have to be existentially quantified over, but I simplify the derivations for brevity.

b. hahaoya-dake-ga kodomo-ga sodate-rareru-koto (the same meaning as (18))
cf. hahaoya-dake-de kodomo-ga sodate-rareru-koto
'Children can be brought up by mothers alone.'

We assume that to maintain the parallel between the suffix *(rar)e* and simplex psych predicates with respect to the *ni-ga* alternation, the dative NP in (18) is the argument (experiencer) of the suffix *-rare*, which controls the agent of base verbs (this control relation is dealt with under the lexical entailment theory of control, which I can not discuss for reasons of space (See Chierchia 1984 and Dowty 1985).

We can then explain the *ni-ga* alternation observed in potential and other dative subject constructions in a unified manner. Suppose again that *(rar)e* project the predicate phrase containing at least one gap, and that the position of the experiencer in the matrix clause can be a gap. We adopt a type shift rule suggested in Jacobson (1999) shifting an expression of category (A/B)/.../C into ((A|C)/B... Then, the suffix *rare* of category $(S/TP^{Dat}_{Exp})/VP$ .... will have an analogue of $(S|TP_{Exp})/VP$ ..., which contains a missing experiencer argument. The latter item is of tyep <e,t>, which qualify as a predicate.

(21) Yamada-ga jibun-no kimoti-ga hanas- e-ru

$$\frac{\dfrac{S/(S|TP) \qquad TP^{Nom} \qquad \dfrac{VP/TP_{Th} \qquad (S|TP_{Exp})/VP}{(S|TP_{Exp})|TP_{Th}:\ \lambda x.\lambda y.hanas' \circ eru'(x)(y)}_{<B}}{S|TP_{Exp}:\ \lambda y.hanas' \circ eru'(kimoti)(y)}_{<}}{S:hanas' \circ eru'(kimoti')(Yamada')}$$

Assuming that the matrix VP which *rare* or other simplex psych predicates project must contain at least one gap, we can account for the ungrammaticality seen in (22).

(22) a. *Yamada-**ni** oyog-e-nai-koto
Yamada-DAT swin-can-NEG-fact
'the fact that Yamada cannot swin'
b. *Yamada-**ni** jibun-no kimoti-**o** hanas-se-nai-kot (= (18))
c. *Yamada-ni sono jijoo-**o** wakaru-kot
Yamada-DAT the situation-ACC understand-fact
'Yamada can understand the situation.'
(cf. Yamada-ni sono jijoo-ga wakaru-koto, Yamada-ga sono jijoo-o wakaru-koto[7])

Under the assumption that the VPs projected by the potential suffix and psych predicates allowing for the *ni-ga* alternation are category of $S|TP_{\alpha}$, all arguments of base and matrix verbs in (22) are cancelled via application and the resulting expressions contain no gap, which is not compatible with the category specification of such predicates. We can account for the *ni/ga* alternation of the experiencer by the simple type shift rule introducing gaps into the (matrix) predicates, and the applicability of this rule should be encoded on the lexical entries of the predicates which show the case arrays discussed above.

3. NOMINALIZATION AND *GA-NO* CONVERSION

As observed in (2), the term phrases marked with nominative case can freely show up with genitive case irrespective of their semantic roles in the appropriate contexts. In this paper, we will concentrate on *ga-no* conversion in the nominalizations headed by the formal noun *koto*, to maintain the parallelism between the contexts of nominative and genitive assignments. First, observe the examples in (23):

(23) a. kono hootyoo-ga yasai-ga yoku kir-eru-koto
this kitchen-knife-NOM vegetables-NOM well cat-CAN-fact
'the fact that we can cut vegetables smoothly with this kitchen knife.'
b. kono hootyoo-no yasai-no yoku kir-eru-koto
this kitchen-knife-GEN vegetables-GEN well cat-CAN-fact

The instrumental and theme arguments are marked with nominative case in (23a) and with genitive case in (23b). It has been argued in the generative literature that multiple occurrences of nominative NPs, as in (23a), are due to the property of Infl bearing some feature specification of stativity which can enter into

[7] I find that this sentence is unacceptable, but younger speakers tend to find it grammatical. See Ura (1999).

multiple feature-checking relations with arguments (for example, see Ura (1999)). In parallel with the assumption that the notion of finiteness is responsible for the nominative assignment, suppose that the presence of head noun is responsible for the genitive case assignment. If the relevance of Infl to the nominative case assignment is correct, the multiple genitive phrases in (23b) should be licensed by the head noun *koto* specified for stativity because, if the potential suffix indicating stativity is removed from (23b), the instrumental and theme arguments cannot be marked with genitive case. This line of reasoning seems quite curious. There is no mechanism proposed in the literature which enables oblique arguments to be marked with genitive case, to begin with.

If we extend the function composition analysis of stative predicates and the mechanism transmitting the informations about gaps to the final result category, the genitive marking observed in (23b) and (2) can be straightforwardly accounted for. First, we need to state the adjacency requiment on the genitive case assignment to handle long-distance dependency between the (multiple) genitive phrases and the head noun *koto*, as in (24):

(24) The genitive phrases must be string adjacent to the constituents of category $(NP|TP_{\alpha})/\$$.

Another assumption we need is concerning nominalizations. Chierchia (1984, 1985) argues that properties, the meanings of VPs, have two forms or modes of being: propositional functions and individual correlates of propositional functions. That is, the expression denoting a property can be realized either as a finite predicate phrase or as its nominalization. According to his suggestion, not only Ss (propositions) but VPs (propositional functions) can be nominalized. For example, in *Uso-o tuku-koto-wa yoku-nai* 'Telling lies is not good', the nominalized VP shows up as the subject and refers to as an individual. Following Chierchia, we notate the nominalized property with the operator '$\cap$', as in $\cap$*tell'*(*lies'*). Since the nominalized expression as such cannot take the subject as argument, it has to be predicativized (i.e., denominalized) so as to be saturated by the subject. Let us assume that the case marker *no* acts as the predicativizer, which is indicated by the operator '$\cup$'. Namely, it applies to a nominalized property, and returns the original predicate phrase, which is to be nominalized again after it combines with the subject. *No* is thus translated as in (25):

(25) *no* := $\lambda x \lambda y \cap [\cup y(x)]$

Keeping these assumptions in mind, the derivation of (23b) can be illustrated as in (26), where the operation of the predicativizer *no* is omitted.

(26) kono hootyoo-no yasai-no kir eru koto

TP_{Gen} TP_{Gen} $(VP|TP_{Inst})|TP_{Th}$ $S_{fin}/_{L}VP$ $<_B$ $NP/_{L}S_{fin}$

$(S_{fin}|TP_{Inst})|TP_{Th}$: $\lambda x.\lambda y.kir'$ $\circ$ $eru'(x)(one')(with\text{-}y)$ $<_B$

$(NP|TP_{Inst})|TP_{Th}$: $\cap\lambda x.\lambda y.kir'$ $\circ$ $eru'(x)(one')(with\text{-}y)_<$

$NP|TP_{Inst}$: $\cap\lambda y.kir'$ $\circ$ $eru'(yasai')(one')(with\text{-}y)_<$

NP: $\cap kir'$ $\circ$ $eru'(yasai')(one')(with\text{-}hootyoo')$

In (26), the base verb composes with the suffix, and the resulting complex verb again composes with the formal noun *koto* 'fact' of category $NP/_{L}S_{fin}$. The information about the missing theme and instrumental argument is passed up from the base verb to the nominalized predicate phrase *kir-eru-koto*. Since case conflict (suggesting the lack of connectivity) arises between the TPs marked with genitive case and the gaps in the predicate phrase, we have to invoke some semantic predication rule which allows us to associate the fillers and gaps. After the genitive phrases are interpreted in an appropriate way, the whole expression be shifted back to the individual by the type shifter *no*.

According to Chierchia (1984, 1985), if we assume that predicate phrases as well as clauses can be nominalized and that the genitive marker act as a type shifter shifting nominalized predicates (individuals) to predicates (properties), we can extend our function composition analysis of potential and *tough* predicates to their nominalized expressions with *koto*, derive all the case alternations found in these constructions, as in *Kono hootyoo-de/hootyoo-ga/hootyoo-no kir-eru-koto*, and account for the fact that nominative phrases can be converted to genitive phrases without exception irrespective of their semantic roles. On the other hand, the case absorption approach to the nominative/accusative alternation cannot provide a principled solution to a wide range of case alternation phenomena observed in 2. 1 and 2. 2., including the nominalization phenomena. Note also that the interpretations given at each step in

derivations correctly reflect our intuitions about the meanings of expressions.

4. EMPIRICAL CONSEQUENCES OF THE PROPOSED ANALYSIS

Let us consider some consequences of our approach to the case alternation phenomena here. The first is the interaction between scope interpretation and case marking. Observe the following examples:

(27) a. John-ga migime-dake-o tumur-e-ru-koto
John-NOM right-eye-only-ACC close-can-fact
'John can close only his right eye.' (can > only, only > ?*can)

b. John-ga migime-dake-ga tumur-e-ru-koto
John-NOM right-eye-only-NOM close-can-fact (only > can, *can > only)

c. John-no migime-dake-no tumur-e-ru-koto
John-GEN right-eye-only-GEN close-can-fact

(28) a. boorupen-dake-de rippana tegami-o kak-(ar)e-ru-koto
ball-point-pen-only-by good letter-ACC write-can-fact
'the fact that you can write a good letter only by a ball pen. (can > only, only > can)

b. boorupen-dake-ga rippana tegami-o kak-(ar)e-ru-koto
ball-point-pen-only-NOM good letter-ACC write-can-koto (only > can, *can > only)

c. boorupen-dake-no rippana tegami-no kak-(ar)e-ru-koto
ball-point-pen-only-GEN good letter-GEN write-CAN-PRES-fact

The difference in scope in (27a) and (27b) have repeatedly been picked up in the literature (see Tada 1992, Koizumi 1994, Ura 1999, among others). They observes that, when the object is marked with accusative case in (27a), it has the narrow scope reading with respect to the potential suffix *-(rar)e*, whereas the nominative object in (27b) has scope over the potential verb, intuitively saying that John cannot close his left eye. The point is that the nominative object in (27b) cannot take narrow scope with respect to *-(rar)e*. Koizumi (1994) and Ura (1999), assuming Tada's observation, argue that the nominative object moves up to a position higher than that of the suffix to get the wide scope reading.

This account, however, cannot explain the fact that the nominative-oblique case alternation as in (28), as expected, shows the same behaviors concerning interpretations of quantified NPs. *Boorupen* 'ball-point pen' marked with oblique case in (28a) is ambiguous between the narrow scope and wide scope readings with respect to the potential suffix, whereas, when it is marked with nominative case in (28b), it must take the wide scope reading. Note also that genitive case parallels nominative case with regard to the scope interactions of quantified NPs and the potential verb, as seen in (27c) and (28c). We can account for such interactions between case marking and scope interpretation without additional assumption. The embedded clauses and the suffix (or *tough* adjectives) are combined by composition retaining the information about missing arguments encoded on the category of predicate phrases, which denote the properties of missing arguments and adjuncts. The predicates phrases in (28) and (29) denote singleton sets, only one member of which is the entity denoted by *migime* 'right eye' in (28) and the entity denoted by *boorupen* 'ball-point pen' in (29). Therefore, the nominative and genitive phrases cannot take narrow scope readings with respect to the suffix.

Another consequence of our analysis is that it could give an interesting account for (at least some of) case alternations in simple stative sentences. Consider (29), which have long been the topic of investigation in Japanese linguistics.

(29) a. kono inu-no/-ga atama-ga siroi-koto
this dog-GEN/NOM head-NOM white-fact
'the fact that this dog's head is white'

b. Tokyo-ni/Tookyo-ga/Tokyo-no nezumi-ga ooi-koto
Tookyo-LOC/Tookyo-NOM/Tokyo-GEN rat-NOM numerous-fact
'The fact that there are a lot of rats in Tokyo'

Kuno (1973) proposes the rules to change genitive or locative case on the sentence initial NPs to nominative case. It has recently been assumed in the generatlive literature that the subject is multiply licenced by the appropriate functional category concerning finiteness in stative sentences (e.g, see Ura 1999). It seems to be insufficient to discuss only the conversion of surface case or multiple occurrences of the subject, however. What is noteworthy about sentences as in (29) is that, when marked with nominative case, a sentence initial NP receive the reading in which the entity referred to by the subject has

the property which the residue of the sentence (the derived predicate phrase comprising another nominative NP and the predicates) denotes.

We can derive the multiple subject constructions with appropriate interpretations in the same way as the *tough* and potential constructions, using the gap introduction device and composition rule in (7). Thus, (29a) with the nominative possessor is derived as in (30):

(30) Kono inu-ga atama-ga siroi

$$\frac{TP^{Nom} \qquad TP^{Nom}{}_{Th}|TP_{Pos} \qquad S/TP_{Th} \ <B}{S|TP_{Pos}: \lambda x.siroi'(poss(head)(x))}$$

In *kono inu-no atama*, the category $TP/_{L}TP_{Pos}$ is assigned to *atama* 'head' because it is not an independent entity but a part of it (a function taking possessors to return their heads). In (30), the possessor is missing and the category of the subject *atama* shifts to $TP|TP_{Pos}$. The information about the possessor is finally encoded on the output category S, which shifts to the predicate of type <e,t> and can denote the property of another argument (i.e., the missing possessor), roughly, the set of possessors whose heads are white.

The derivation of (29b) with the locative phrase marked with nominative is quite simple. Assume that predicates optionally subcategorize for adjunct phrases. In (29b), the locative phrase is missing, and the category of *ooi* shifts from $S/_{L}TP_{Th}/TP_{Loc}$ to $(S|TP_{Loc})/TP_{Th}$. After the predicate combines with the theme to yiled the derived predicate *nezumi-ga ooi* of category $S|TP_{Loc}$ and of type <e,t>, denoting a property of Tokyo, yielding the reading in which Tokyo is such that there is a lot of rats there. We can easily derive more complex expressions such as *Tokyo-ga tosibu-ni nezumi-ga ooi* 'In the downtown of Tokyo, there are a lot of rats' exactly using both the type shift rule and composition.

Under the approach pursued here, we can explain the fact that the genitive phrase in (31) is once subjectived, and then, marked with genitive case again because the constituent like [*kono inu-no tokuni atama*](the sequence of NP-Adverb-NP) are impossible in Japanese.

(31) kono inu-no tokuni atama-ga siroi-koto
this dog-GEN especially head-GEN white-fact

In (31), the derived paredicate phrase *atama-ga siroi* as such can concatenate with the adverb *tokuni* 'especially' and then nominalized. The genitive phrase *kono inu-no* will finally be associated with the gap of the posssessor in the nominalized predicate in the appropriate way.

5. CONCLUSION

We proposes a unified account to a wide range of case alternation phenomena in stative sentences under the categorial framework. Some of the stative predicates in Japanese, including the potential suffix and *tough* predicates, have the property of encoding the information about a gap (or gaps) on the category of resulting predicate phrases. The subjects of category $S/(S|TP_{1}...TP_{n})$ are multiply licensed by being string adjacent to the constituents projected from finite predicates with stativity. Following Jacobson (1992), we assume that the subject and the gaps in predicate phrases lack syntactic connectivity and that some semantic/pragmatic devices (something like the Aboutness Condtion) should be invoked for linking them.

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