Analyzing the verbal noun: Internal and external constraints

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Japanese verbal nouns such as *sakugen* 'reduction' and *saikuringu* 'cycling' appear initially noun-like, in morphology and distribution. They normally take adjectives and nominal case marked arguments (that is, preceding arguments and modifiers are case marked with the genitive *-no* or an oblique particle followed by *-no*, such as *-e-no* 'to-GEN'), as in (1a).[1] In such a sentence, verbal case marked arguments (by which I mean use of particles like *-ga* and *-o* to mark subject, object and oblique grammatical roles) is impossible, as shown in (1b).

(1) a. [Nihon-**no** bōeki-kuroji-**no** ōhaba-na SAKUGEN-ga]
Japan-GEN trade-surplus-GEN drastic reduction-NOM
nozomarete-iru
desire.PASS-PROG.PRES
'Japan is required to drastically reduce its trade surplus.'

[0]My thanks to the many people who have helped me with this paper. First and foremost should be mentioned Peter Sells and Masayo Iida upon whose work this paper builds. I have also received advice and comments (relating to data or linguistic analyses, though generally the latter) from Lynn Cherny, Hye-won Choi, Mary Dalrymple, Yookyung Kim, Yoshiko Matsumoto, Shigeru Miyagawa, Bill Poser, Yoshiko Sheard and Shûichi Yatabe. My email address is manning@csli.stanford.edu.

[1]Verbal nouns are written in small capitals in all the examples. I will largely restrict myself to discussing non-native verbal nouns (of Chinese and Western origin). See Tsujimura (forthcoming) for a discussion of native deverbal nouns.

b. *[Nihon-**ga** bōeki-kuroji-**o** ōhaba-ni SAKUGEN-ga]
nozomarete-iru

Verbal nouns are θ-assigners with their own argument structure and thus similar to English complex event nominals, such as *arrival*, even though verbal nouns are in general not synchronically derived from verbs. However, verbal nouns are also verblike: when acting as the main predicate of a sentence in conjunction with the pro-verb *suru* 'do', as in (2), their arguments can or must take verbal case marking:

(2) Jon-wa murabito-ni ōkami-ga kuru-to
John-TOP villager-DAT wolf-NOM come.PRES-COMP
KEIKOKU-o shita
warning-ACC do.PAST
'John warned the villagers that the wolf was coming.'

It is often suggested that *suru* licenses the verbal case marking of these arguments, perhaps as the result of argument transfer of θ-roles from the verbal noun to *suru* (Grimshaw and Mester 1988). However, Sells (1988) demonstrated that this cannot be the explanation in all cases. In a sentence such as (3), *suru* could not be assigning the first noun phrase Case because that would violate the 'Double-*o* constraint' (specifically, the part of the 'Double-*o* constraint' that prevents two nominals from bearing the same abstract Case, see Poser (1989) for discussion). Rather, accusative Case must be being assigned directly by the verbal noun, even though the NP has scrambled from the verbal noun's projection as shown:[2]

(3) [Kaiketsu-no hōkō -wa /?-o $]_i$ sono hōkokusho-ga
solution-GEN direction TOP/ACC that report-NOM
Mari-ni $[_{NP}$ t_i SHISA-o] shite-iru
Mary-to suggestion-ACC do-PROG.PRES
'This report suggests to Mary the direction of the solution.'

Iida (1987) presented a considerable amount of additional evidence that verbal nouns can assign verbal case by showing that it happens in at least three other contexts: when verbal nouns genitively modify certain temporal nouns such as *sai* or *ori* 'occasion' (4a); with certain 'temporal affixes' such as *-chū* 'in the middle of' or *-go* 'after' (4b); and in controlled purpose clauses (4c):[3]

[2] While scrambling out of NPs is generally impossible, it is possible when the constituents are verbal case marked (Sells 1991). Thus, scrambling is also possible with the verbal case marked constructions which I consider below, but this 'long distance scrambling' is not further discussed in this paper.

[3] A verbal noun can also appear with preceding verbal case marked arguments

(4) a. [Sōridaijin-**ga** Amerikataishi-**to**
Prime minister-NOM American.Ambassador-with
KAIDAN-no] **ori**-ni Tarō-wa tsūyaku-o
meeting-GEN occasion-at Tarō-TOP translation-ACC
tsutometa
perform-PAST
'When the Prime Minister met the American ambassador, Tarō acted as translator.'

b. [Jikken-**ga** buji-ni SHŪRYŌ-**go**] wareware-wa minna-de
experiment-NOM safely finish-after we-TOP together
shukuhai-o ageta
toast-ACC raise-PAST
'We raised a toast after the experiment was safely completed.'

c. Kikuko-ga Amerika-ni [Eigo-**o** BENKYŌ-**ni**-wa]
Kikuko-NOM America-to English-ACC study-PURP-FOC
kyonen itta-ga
last year went-but
'Kikuko went to America last year to study English (, but)'

In this paper, I wish to analyze the behavior of the verbal noun in these contexts that Iida discussed, and examine how the existence of words of apparent mixed categorial status impacts on possible theories of UG. Similar data occur also in Korean (and are discussed in Saiki and Cho 1987 and Y.-S. Lee 1991), but I will concentrate on Japanese.

1 The Data

In each of the three contexts just described, a verbal noun can be preceded by either nominal or verbal case marking:[4]

(5) a. [Kanai-ga Amerika-o HŌMON-no ori-ni-wa],
my.wife-NOM America-ACC visit-GEN occasion-on-TOP
iroiro osewa-ni narimashita
various hospitality-ADV.PART become.POLITE.PAST

in some other special contexts, such as newspaper headlines (Kageyama 1977:120), as in (i), but it cannot normally license verbal case marking by itself (recall (1b)).

(i) Nihon-josei Himaraya ni TOZAN!
'Japanese women climb the Himalayas!'

[4] This paper tacitly assumes the argument structure of a verbal noun is the same in its nominal and verbal usages, but I have recently become aware of Hasegawa 1991 which argues convincingly that this is not always so. I have yet to fully incorporate her observations (which deal mainly with *suru* constructions), but feel that categorial underspecification will remain a useful part of a complete analysis.

'Thank you for your generous hospitality when my wife visited America.'

b. [Kanai-no Amerika-no HŌMON-no ori-ni-wa], ...
my.wife-GEN America-GEN visit-GEN occasion-on-TOP

(6) a. [Jon-ga ainugo-o KENKYŪ-chū-ni] dareka
John-NOM Ainu.language-ACC research-during-at someone
kite shimatta
come end.up.PAST
'Someone (unfortunately) came in the middle of John's research into Ainu.'

b. [Jon-no ainugo-no KENKYŪ-chū-ni] ...
John-GEN Ainu.language-GEN research-during-at

(7) a. Kenzō-ga [shinsaku-o HAPPYŌ-ni] Tōkyō-ni itta
Kenzō-NOM new.line-ACC introduce-PURP Tokyo-to went
'Kenzō went to Tokyo to introduce his new (product) line.'

b. Kenzō-ga [shinsaku-no HAPPYŌ-ni] Tōkyō-ni itta
Kenzō-NOM new.line-GEN introduce-PURP Tokyo-to went

Additionally, as observed by Sells (1988), one gets mixed case marking (some arguments have verbal case marking while others have nominal case marking), as in (8a–b). This is only possible when the verbal case marked arguments are higher on the θ-hierarchy than the nominal case marked ones, and they appear higher up in the S-structure tree (i.e., to the left) (8c). These data prevent an analysis in which a word like *kenkyū-chū* is simply specified disjunctively as either a verb or a noun.

(8) a. Tarō-**ga** Tōkyō-**e** piza-**no** YUSŌ-chū-ni, ...
Tarō-NOM Tokyo-to pizza-GEN sending-during-at
'While Tarō was sending the pizza to Tokyo, ...'

b. Tarō-**ga** Nihon-**no** RYOKŌ-no ori-ni, ...
Tarō-NOM Japan-GEN travel-GEN occasion-at
'When Tarō was traveling in Japan, ...'

c. *Tarō-**no** Nihon-**o** RYOKŌ-no ori-ni, ...
Tarō-GEN Japan-ACC travel-GEN occasion-at

I will omit examples showing the scrambling possibilities (see Sells (1991) and especially Lee (1991)[5]), but the proposal I will present also

[5] But note that scrambling of nominal case marked arguments is not possible in Japanese, even when the sentence contains additional arguments or adjuncts – such sentences can only be interpreted with appropriate pauses as sentence repairs. Their acceptability in Korean varies greatly between speakers, as noted by Lee.

handles cases with clause internal scrambling.

Even when a temporal suffix is attached to a verbal noun, the phrase has the same external distribution as any other noun phrase, regardless of whether the case marking of its arguments is verbal, nominal or mixed. For example, such a phrase can appear as subject or object (marked with *-ga* or *-o*) as in (9a), in a topic or contrastive position (marked with *-wa* or *-mo*), before the copula as in (9b), modifying another noun genitively (marked with *-no*), or as a time adverbial. This distribution corresponds closely to the distribution of an adverbial NP headed by a 'temporal' noun such as *toki* 'when'.[6]

(9) a. Tarō-wa sono henji-o suru jiki toshite [Hawaii-ni
Tarō-TOP that answer-ACC do time as Hawaii-in
RYOKŌ-chū-**o**] eranda
travel-mid-ACC chose
'Tarō chose the period of traveling in Hawaii as the time to make his response.'

b. Kaisha-ga [shukusha-o KENCHIKU-chū] **da**
company-NOM dormitory-ACC construct-mid is
'The company is in the midst of building dormitories.'

2 On the proper treatment of 'mixed-category' items

There are many other cases of 'mixed-category' items like verbal nouns, such as the nominalized verbs in Quechuan languages (described in Lefebvre and Muysken 1988), and the English gerund, as in (10).

(10) John's joining the Ku Klux Klan was foolish.

While there are also important differences between these constructions, they have a common thread: their external distribution is NP-like, but internally there are arguments which one would expect to appear only in a projection headed by a verb or some Infl-like functional category.

A recently popular explanation of mixed category items is the use of functional projections. Functional projections allow a 'clean' way for the apparent nature of a phrase to change as one moves up the tree, while maintaining endocentricity. Thus Abney's (1987) analysis of gerunds as VP complements to D simultaneously explained the internal verbal character of the phrase and its external nominal character (once a noun phrase is reanalyzed as a DP).

[6] And the differences in distribution between *toki* phrases and other noun phrases are being regarded as purely semantic, following from the fact that the head noun is a time rather than a thing.

Despite their widespread adoption in recent work, there are problems in using functional categories in the analysis of Japanese and Korean. Sells (1992) raises such general concerns as the arbitrariness and undermotivation that results when functional heads are null or head-movements are string vacuous, and various problems with selection, locality and functional category ordering. A particular problem, which makes a DP-style treatment of the verbal noun suspect, is the following. While the Japanese verbal noun and the English gerund both allow mixed case marking (compare (8a) and (10)), the ordering is the opposite: in English the verbal case marking must appear internal to the nominal case marking, whereas with Japanese verbal nouns, verbal case marking must appear external to nominal case marking. This means that while an Abney-style approach works well in English, it is unmotivated in Japanese. Such an analysis does not explain why the external distribution of the verbal noun phrase is nominal.

3 Previous Analyses

3.1 Miyagawa (1991)

Miyagawa (1991) proposed the structures shown in (12) for cases in which a verbal noun plus -*chū* has verbal and nominal case marking:

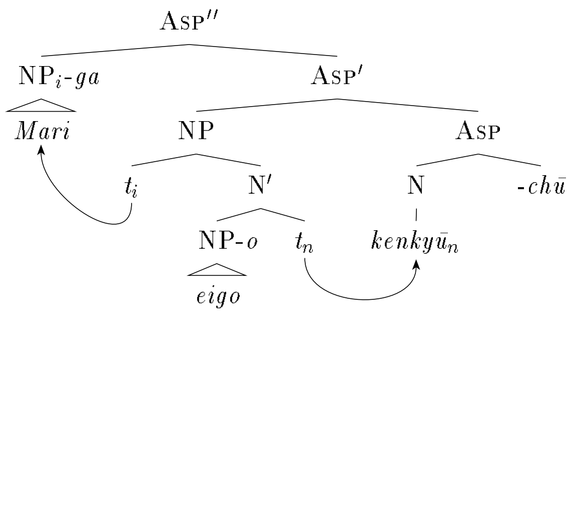
(11) a. Mari-ga eigo-o kenkyū-chū

b. Mari-no eigo-no kenkyū-chū

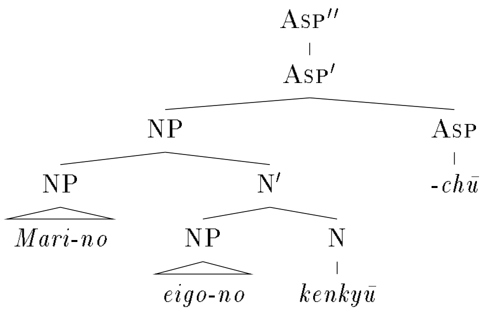
c. Mari-ga eigo-no kenkyū-chū
'while Mary is doing research on English'

d. *Mari-no eigo-o kenkyū-chū

(12) a.



b.



In other situations (such as example (1a)), where only nominal case marking is possible, Miyagawa proposed that we have simply an NP. The ability to assign verbal Case occurs 'only if the nominal clause itself is a part of a larger clause headed by an aspectual element' (p. 6). But, as observed in Sells (1991), this analysis predicts that a clause 'headed' by a verbal noun is sometimes an NP and sometimes an ASPP, and this would only be justified if these two phrases had different syntactic distributions, which they don't. Further, ASPP is usually regarded as a projection that appears above VP, not NP (Rivero 1990, Mitchell 1991).

The internal structure of this proposal is also undermotivated and problematic. The analysis of subject case marking involves the subject NP moving to [Spec, AspP], but (as Lee 1991 observes) there does not seem to be any independent evidence indicating that movement has occurred here. Conversely, object case marking involves the head verbal noun incorporating into Asp^0. Miyagawa's proposal for the mixed case marking asymmetries (why (11c) is okay, but (11d) is bad) relies crucially on the stipulation that licensing of genitive case is not transmitted under government (so that if *kenkyū* incorporates into *-chū* to license accusative case on *eigo*, it no longer licenses genitive case on *Mari*). But this stipulation is unwarranted: in languages which have noun incorporation, a genitive case marked possessor can be left 'stranded' when incorporation occurs (see Baker 1988:96–105). Also, on Miyagawa's analysis, one should be able to get an adjective or demonstrative modifying the verbal noun or its trace (cf. Baker 1988:93–96 for the incorporation case), but a sentence like (13) is impossible:

(13)	*Jon-ga	Mari-no	ronbun-o	[$_{\text{NP}}$kibishii t_i]	HIHAN$_i$-go-ni
	Jon-NOM	Mary-GEN	thesis-ACC	severe	criticism-after-at

3.2 Lee (1991)

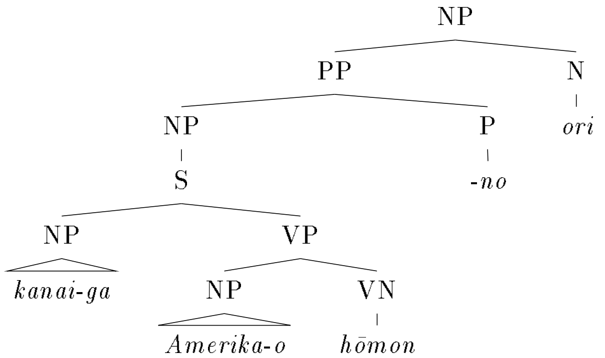
Y.-S. Lee (1991) argued for base generation of the arguments of a verbal noun phrase – a position I endorse. Her analysis thus lacks the technical problems of phrase internal structure just discussed, but the problem of the verbal noun phrase's external distribution remains the same. The equivalent of Miyagawa's AspP in Lee's analysis is an XP[+V]. Late in the paper, she suggests that this XP[+V] is in fact a PP (while conceding that this is inconsistent with the featural decomposition of Chomsky (1970)).

This means analyzing suffixes like *-chū* as prepositions, and recall that Miyagawa (1991) regarded them as members of the functional category Asp. Neither of these proposals seems very appealing. In traditional Japanese grammar, items like *-chū* are classified simply as nouns. While *chū* does have a few specialized independent uses such as *chū o toru* 'to take the middle course', in the use we are concerned with here, *-chū* cannot stand alone, even if suitably modified (**benkyō-no chū* 'while studying'). Thus, this *-chū* is a bound morpheme (and behaves much like the many other Sino-Japanese morphemes that are bound nominal suffixes). But it still seems entirely reasonable to regard suffixes like *-chū* as of category N. Their behavior is special only in so far as they are bound forms with a temporal aspectual meaning. There is no evidence for suffixes like *-chū* behaving like postpositions and such a proposal does not explain why the external distribution of an XP[+V] is the same as that of a regular noun phrase.

3.3 Shibatani and Kageyama (1988)

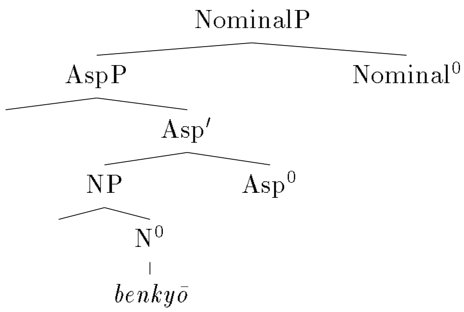
In an earlier paper, Shibatani and Kageyama (1988) solved the problem of external distribution by proposing an NP-over-S phrase structure:

(14)



This is an obvious (if not very theoretically attractive) response to the internal verbal case marking and external nominal character of such examples. One could try to 'fix' a functional categories analysis along the same lines by proposing another null-headed functional category, so that what I am calling a 'verbal noun phrase' really looks like (15):

(15)



But unconstrained use of functional categories in this manner allows anything to be changed into anything else, so the resultant grammatical theory becomes largely devoid of content. Moreover, even this proposal seems unable to explain the purpose clause data I will present below.

4 Proposed Analysis

If the behavior of the verbal noun is accounted for purely categorially (as in Miyagawa and Lee's proposals), then, in cases of verbal or mixed case marking, there will always be a contradiction. Phrase internally, the upper reaches of the clause appear verbal while the external distribution is that of any other noun phrase. Thus some theoretical innovation is required. Sells (1991) chose to maintain that the verbal noun is categorially an N, but this forced him to the view that taking verbal case marked arguments and being modified by adverbs are not properties of being a verb, but of something else (having dependents, something that one might claim to be a semantic notion, but that leaves unresolved how Japanese event nouns differ from English event nouns). I find this direction unappealing and would like to maintain such basic intuitions as the fact that adverbs modify verbs. So, I will suggest moving to a more sophisticated notion of categoriality. The account has three ingredients: morphological licensing, along the lines suggested by Iida (1987), the use of categorial underspecification, and the division of the concept of category into two parts, categorial information and combinatoric information, as proposed by Cho and Sells (1991).

4.1 Morphological licensing

While a verbal noun can license verbal Case on arguments in some contexts, it cannot do so generally (recall (1b)). Thus words and suffixes like *sai* or *-chū* play a crucial role in allowing verbal nouns to assign verbal case. Iida (1987) suggested that these forms have an aspectual feature [+ASP] which they transfer to the verbal noun, and which licenses it to assign verbal case. Let us generalize this proposal, and suggest that all words in Japanese can only assign verbal case if they are aspectually licensed – a similar intuition appears in Miyagawa (1991). For verbs and adjectives, inflectional endings provide aspectual licensing (except for the *ren'yōkei* which can thus only appear when it inherits aspectual licensing from another verb to its right or the purpose marker *-ni*). For verbal nouns, the aspectual endings on *suru* can license the verbal noun to assign verbal case, but verbal nouns can also be aspectually licensed by forms like *-chū* and *sai*, or the purpose marker *-ni*: these forms provide the feature [+ASP] which percolates to the verbal noun by the usual mechanisms of morphological feature percolation and Spec-Head agreement.[7]

4.2 Categorial underspecification

Next I propose that the verbal noun is an underspecified category that is compatible with behaving as either a verb or a noun. The idea that the verbal noun has both a nominal and a verbal character is not new (for example, Inoue (1976) suggested that a verbal noun could be inserted under either an N or a V node (in the latter case suffixed by *suru*)). The mixed case marking constructions show the insufficiency of a simple disjunction and so I will introduce a concept of categorial underspecification, based on using a partially ordered hierarchy of sorts.

One way to implement a hierarchy of sorts is via a featural decomposition of categories. In Chomsky's (1970) system, the sort [+V] is sort-compatible with both verbs and adjectives (which are [+V, −N] and [+V, +N] respectively). I cannot use this featural decomposition, because, within it, there is no feature that is shared by verbs and nouns, but I could adopt another one. For example, Jackendoff (1977:31) suggested 'there are many rules which generalize across supercategories N and V' and proposed a feature decomposition in which verbs and nouns share the features [+Subj, +Comp]. This featural decomposition has recently been supported by Grimshaw (forthcoming), who advocated an idea of categorial neutralization similar to the one I am exploring.

However, it is not necessary for there to be a featural decomposition of categories. It is sufficient to give a hierarchy that shows sort compatibility. Let me thus merely suggest that the sort of verbal nouns, which I will call VN, is sort compatible with being a verb or a noun. So, part of the categorial sort hierarchy for Japanese looks like (16):

[7] For exceptional cases like newspaper headlines, let me just suggest that aspectual licensing is being provided by the discourse context.

(16)
$$\begin{tikzcd}[column sep=small] V \arrow[dr, dash] & & N \arrow[dl, dash] & & A \\ & VN & & & \end{tikzcd}$$

The idea is that when some word or affix SELECTS for a certain category, any category that is sort-compatible with the desired category can fill the slot. A word is sort-compatible if its category is less than or equal to the category being selected for in the above partially ordered set. Thus, in cases of selection, a verbal noun can appear anywhere that a verb can and anywhere that a noun can, retaining its own sort in the phrase structure tree. And, rather than requiring categorial identity between a phrase and its head, the head need merely be sort-compatible. However, it is also possible for another word to SPECIFY the sort of a sister. In this case, the sort of the sister becomes the sort which is specified. Below, I will denote SELECTION with just a category name, and SPECIFICATION with a category name followed by an exclamation mark, for example, by V vs. V!.

4.2.1 Evidence from purpose clauses

The suggestion that verbal nouns can, ceteris paribus, appear wherever a verb is selected is non-standard, but ultimately an attraction of my proposal. Normally the result of doing so is ruled out independently by the aspectual licensing requirement, since verbal words require aspectual licensing, and verbal nouns (like regular nouns) are morphologically defective and cannot host normal verbal inflections. However, where aspectual licensing is being provided by another element, such as the purpose marker *-ni*, a verbal noun can appear in a slot where otherwise only verbs appear.

Two lines of argument show that the purpose marker *-ni* only attaches to verbs and not to the segmentally identical deverbal noun derived from verbs. First, note that one gets purpose clauses with verbs which lack a corresponding deverbal noun, such as, *taberu* 'eat':

(17)	Kinō-wa	isogashikute	hirugohan-o	**tabe-ni-mo**	ikanakatta
	Yesterday	busy	lunch-ACC	eat-PURP-even	go.NEGPAST

'I was so busy yesterday I never even went to have lunch.'

Secondly, for some verbs the accent on the *ren'yōkei* differs from that on the deverbal noun (Kawakami 1973, Poser 1984). For example, if the verb is simplex and accented, normally the *ren'yōkei* has its accent on the penultimate mora while the deverbal noun has its accent on the final mora as in (18):

(18) a. Jon-wa umi-de **oyógi**, Mari-wa kawa-de oyoida
John-FOC sea-at swim Mary-FOC river-at swim.PAST
'John swam in the ocean and Mary swam in the river.'

b. Jon-wa **oyogí**-ga umai
John-TOP swimming-NOM skillful
'John is good at swimming.'

The purpose morpheme *-ni* is accentually inert when it attaches to an accented word, so we can see in (19) that it attaches to a verb (the *ren'yōkei*) and not to the deverbal noun:

(19) a. umi-e **oyógi**-ni iku
sea-to swim-PURP go.PRES
'I go to the beach to swim.'

b. *umi-e **oyogí**-ni iku

Consider then (20), which shows that a verbal noun can appear before the purposive *-ni* with or without *shi*, the *ren'yōkei* of *suru* 'do':

(20) a. Jon-wa sūgaku-o KENKYŪ-ni Furansu-e itta
John-TOP math-ACC research-PURP France-to go.PAST
'John went to France to do mathematical research.'

b. Jon-wa sūgaku-o KENKYŪ-shi-ni Furansu-e itta

Under any proposal where the verbal noun is just a noun categorially, this behavior is inexplicable. The data can only be described via some gross disjunction such as Tsujimura's (forthcoming) '*ni* can take either a noun or the *renyōkei* form of a verb, except when a native word is involved, in which case only the *renyōkei* form of a verb is allowed.'

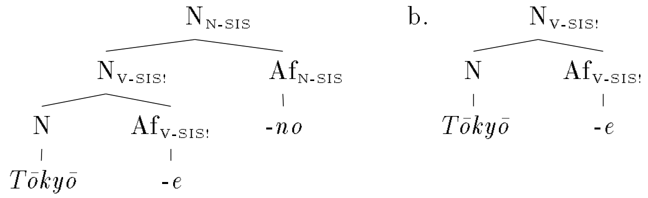
However, under my account, these facts fall out simply: the purpose marker *-ni* selects a verb to attach to, and since VN is sort-compatible with V, it is predicted that a verbal noun can appear before *-ni*. Of course, the verbal noun does not appear everywhere the *ren'yōkei* is licensed. This is captured by Cho and Sells's (1991) distinction between categorial and combinatoric information. While the purpose marker *-ni* attaches morphologically, selecting for category V, in other places where the *ren'yōkei* appears, its distribution is governed by the syntax, which is partly determined by combinatoric information, and the combinatoric information of the *ren'yōkei* differs from that of the verbal noun.

4.3 Categorial information vs. Combinatoric information

Cho and Sells (1991) propose that the features which are normally presumed to reflect a word's category are divided into two types of information: CATEGORIAL INFORMATION and COMBINATORIC INFORMATION. The aim is to capture the sense in which the inflectional morphology is left-headed (so that *hanasu*, *hanashitari* and *hanashite* are all verbs) while still capturing the fact that inflectional endings affect how words combine in the syntax. See Sells (1992) for a more extensive justification of this scheme.

For categorial information Sells uses traditional labels such as N, V and A, while for combinatoric information, words are given a type: N-SIS or V-SIS for things that appear as arguments of a nominal or verbal head, and SENTENCE for items that stand alone or engage in sentential conjunction (that is, the *ren'yōkei*).[8] Categorial information is everything that is selected for by another head. Combinatoric information adds to the very general information given by a one bar level X′ structure (of the sort proposed by Fukui 1986) to correctly determine the distribution of categories. Combinatoric information is consistently inherited from the righthand sister, and serves to constrain only syntactic combination (so word-internal combinatoric information serves no function). Thus, while both *Tōkyō-e-no* and *Tōkyō-e* are nouns, the former appears inside an NP because it is [TYPE: N-SIS] while the latter appears inside a VP because it is [TYPE: V-SIS!]:

(21) a. b.



4.3.1 Clauses with *-chū* or *sai*

Together these ideas combine to give a satisfactory analysis of clauses with forms like *-chū* or *sai*. The verbal noun, an underspecified VN, can appear as the head of either a V′ or an N′. The combinatoric information of a phrase ending in *-no* is [TYPE: N-SIS] and it can therefore modify an N or a VN (without changing its categorial status). However, an adjective or demonstratives like *sono* will specify that they are the sister of a noun, and so they potentially further determine the sort of the head, and this information will then percolate upwards. Similarly, a verbal case marked daughter or various other adjuncts such as adverbs will specify their head sister by being [TYPE: V-SIS!]. Saying that *-no* only selects (rather than specifying) its sister captures the asymmetry between nominal case marking and verbal case marking in

[8] Sells referred to these forms as ¬TYPE.

mixed case marking constructions. In this way, the model explains the basic facts about nominal, verbal and mixed case marking, as shown in (24).

(22) a. [*benkyō*]$_{\mathrm{VN}_{\text{V-SIS}}}$ b. [*sono*]$_{\mathrm{Det}_{\text{N-SIS!}}}$

c. [*kibishii*]$_{\mathrm{A}_{\text{N-SIS!}}}$ d. [*kibishiku*]$_{\mathrm{Adv}_{\text{V-SIS!}}}$

e. [-*no*]$_{\mathrm{Af}_{\text{N-SIS}}}$ Case marker suffixed to N

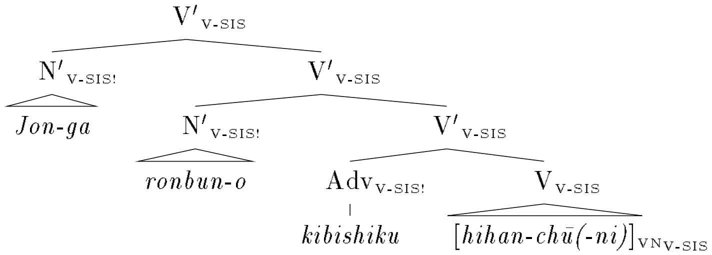
f. [-*ga*]$_{\mathrm{Af}_{\text{V-SIS!}}}$ Case marker suffixed to N

g. [-*ni*]$_{\mathrm{Af}_{\text{V-SIS!}}}$ Purpose marker suffixed to V

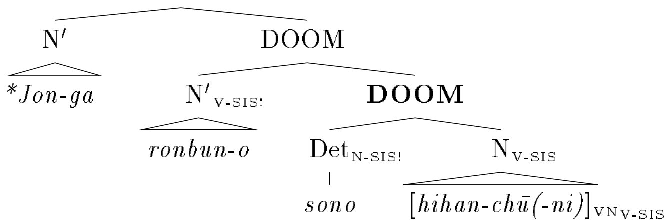
(23) a. Jon-ga ronbun-o kibishiku HIHAN-chū, ...
John-NOM thesis-ACC severely criticism-during
'During John's severe criticism of the thesis, ...'

b. Jon-ga Ainugo-no KENKYŪ-no sai, ...
John-NOM Ainu.language-GEN research-GEN occasion
'While John was doing research into Ainu, ...'

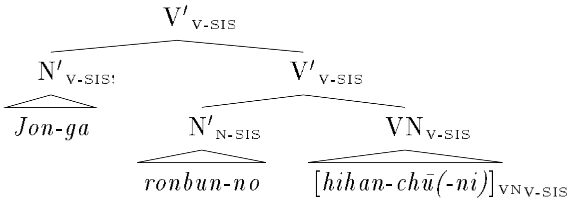
(24) a.



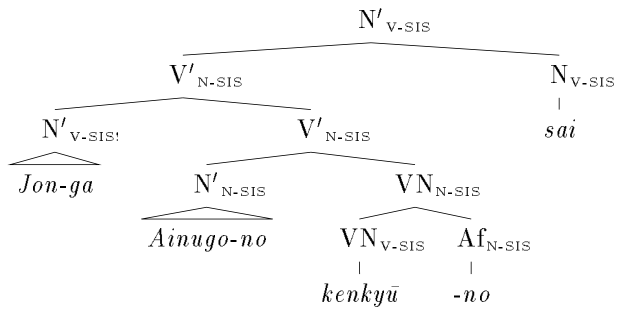
b.



c.



d.



With verbal case marked arguments as in (24a), the clausal projection is specified as verbal, but the combinatoric information is always just inherited from the righthand daughter, so in this and the following examples, the clause remains [TYPE: V-SIS], that is, it has the same external distribution as any other noun phrase. (24b) shows that one cannot have elements that specify a verbal and nominal sister in the same clause, as the result is contradictory. However, a phrase like *ronbon-no* only selects for an N sister, and VN is sort-compatible with N, so the sort of mixed case marking shown in (24c) is correctly predicted to be possible. This prediction cannot be captured by simply suggesting that the verbal noun is disjunctively specified as either a verb or a noun. Also, this analysis does not require *-chū* to be a separate head in order to explain mixed case marking. This is highly desirable, given that mixed case marking also occurs with independent nouns like *sai* (for which such an analysis is less plausible). Here such cases receive an identical analysis, as indicated in (24d).[9]

4.3.2 Purpose clauses revisited

These same ideas also yield a satisfying account of the case marking possibilities in purpose clauses. The analysis is indicated in (26):

(25) a. Ainugo-no benkyō-ni b. *Ainugo-no benkyō shi-ni

[9]Finally, to correctly predict the possibilities for clause-internal scrambling, an additional constraint is needed. The constraint is that if at least one of any pair of arguments of a VN is nominally case marked, then the linearly first argument must be superior to the second on the thematic hierarchy. Restated formally:

(i) If at least one of (any) two arguments p and q of a verb is nominal case marked, then:

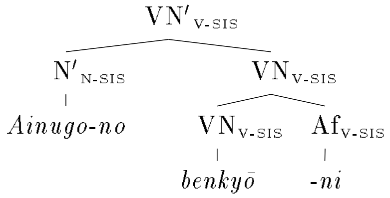
$$p >_\theta q \iff p \succ q$$

where $>_\theta$ means 'is higher on the θ-hierarchy' and $\succ$ can be read as 'c-commands' or 'linearly precedes' (i.e., either reading is adequate). This sort of thematic precedence condition is similar in sort to the one that appears in Grimshaw and Mester (1988).

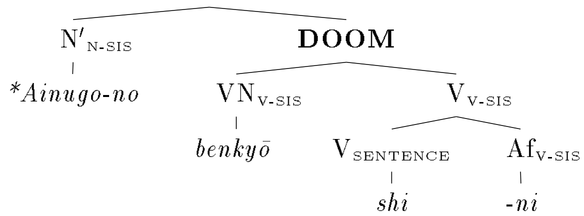
b. Ainugo-o benkyō-ni
   'in order to study Ainu'

d. Ainugo-o benkyō shi-ni

(26) a.



b.



Note especially (26a) which provides crucial evidence for the categorial underspecification analysis presented here. *Ainugo-no* selects for a nominal sister while *-ni* selects a verb as its morphological host. Nevertheless, (26a) is grammatical, as is correctly predicted by a categorial underspecification account. This result could not be obtained if the verbal noun were just specified disjunctively. Conversely, when the *ren'yōkei* of *suru*, *shi*, appears, verbal case marked arguments are still possible, but nominal case marking is now impossible, and this is again correctly predicted, as indicated in (26b).

5 Conclusion

The data requires an analysis that explains nominal, verbal and mixed case marking within a verbal noun phrase while still capturing the fact that a verbal noun phrase has the same distribution as any other noun phrase. I have argued that functional categories do not give a good solution to this problem; rather the only available solution trivializes the problem. I then presented my own three-part solution. Two of the parts have been suggested independently, so the new idea I wish to emphasize is how the use of categorial underspecification can provide a good solution to problems of mixed categorial status.

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