

hirogari-tyuu: Category Extension in Japanese Lexical Classes and Parts of Speech

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There are several ways to categorize the Japanese lexicon. Like many of the world's languages, it is possible to divide Japanese into so-called lexical categories—within Japanese, nouns, verbs, adverbs, and adjectives are among those that are generally recognized. Additionally, there are some theories that claim the necessity of a “verbal noun” part of speech; however, these claims are not entirely convincing, and what exactly can count as a verbal noun requires specific elaboration. However, there are other methods for splitting up the lexicon—in particular, *gosyu*, or etymologically-based classes. In traditional Japanese grammar, the *gosyu* categories are Native (sometimes called Yamato), Sino-Japanese, and Foreign (that is, recent borrowings mostly from languages in western nations). Although from a diachronic point of view, such categories may be necessary, there is room for argument as to their necessity in a synchronic grammar of Japanese.

In this paper, I will examine a phenomenon that may shed some light on the workings of lexical categories (parts of speech) and *gosyu*. Specifically, I will examine the linguistic behavior of a form that expresses a temporal relationship, *-tyuu*, in relation to lexical classes and *gosyu*. Constructions that contain the temporal-relationship marker *-tyuu* or those like it (taking *-tyuu* as the prototypical example, I will refer to such constructions as “*tyuu*-constructions”) have been touched upon by Shibatani (1990) and Kageyama (1993), and in particular Miyamoto (1999) and Ohta (1995) have paid close attention to them. This paper will attempt to determine what sort of word or phrase is selected for by *-tyuu*, and what sort of characteristics those words or phrases must have. As will become clear later on, this question cannot be answered simply by examining lexical classes or *gosyu*, or even syntactic behavior surrounding some interaction of the two. I will show that semantic factors must play a crucial role. I then hope to further demonstrate that the primary factors are not merely “semantic,” but must be couched in the concepts of prototype effect and radial categories.

1 An analysis of the *tyuu*-construction

1.1 *tyuu*-construction and *gosyu*

First, I will examine the relationship between the construction and *gosyu*, or pseudo-etymological word classes. As can be seen in (1), the combination of *-tyuu* with a bimorphemic Sino-Japanese compound is quite common in newspapers and other official documents.¹

- (1) (a) *kodomo no 33% ga kazoku to syokuzi-tyuu ni meeru soosin*
child GEN NOM family with meal-TYUU DAT mail sending
33% of children send electronic mail during mealtime with family
- (b) *tizin no otoko wa kaigai ni toubou-tyuu to yuu*
acquaintance GEN man TOP overseas DAT escape-TYUU CP say
[his] acquaintance is allegedly at large [lit. during escape] overseas

It certainly seems as though the *tyuu*-construction works well in formal discourse, where Sino-Japanese loans are in abundance, but *-tyuu* can also combine with native compound verbs without difficulty.

- (2) *torisirabe-tyuu ni hankoo o zihaku sita ga ...*
investigation-TYUU at commit-crime ACC confess do-PAST but
Although [he] confessed to the crime during the investigation ...

The construction also works fine with recent loan words:

- (3) *goo sidonii hokutoobu no manrii tiku no kaigan de daibingu-tyuu*
australia sydney northeast GEN Manly area GEN coastline at diving-TYUU
ni yukue fumei ni natteita yamanasi ken
at whereabouts unknown DAT becoming-PART-PAST Yamanasi prefecture
syussin no ...
born GEN
... from Yamanasi Prefecture [who] went missing while diving on the coast of the
Manly area in Sydney, Australia

Excluding mimetic words, the *-tyuu* construction can combine with words belonging to any of these lexical classes. From the above facts, it might seem that consideration of only *gosyu* will not lead to a definitive conclusion as to the type of word that is compatible with the *tyuu*-construction. However, it need not be the case that *gosyu* are completely irrelevant. As will be seen later, the theory of *gosyu* will come into play when explaining what sort of element the *tyuu*-construction calls for.

¹The abbreviations used in this paper are: NOM - Nominative; ACC - Accusative; DAT - Dative; GEN - Genitive; TOP - Topic; PERF - Perfective; PAST - Past tense; CAUSE - causative; PASS - Passive; RECIP - Reciprocal; CP - Complementizer; COP - Copula; HON - Honorific; HUM - Humble

1.2 *tyuu*-construction and Parts of Speech

Based on the examples seen so far, it is clear that the form that accompanies *-tyuu* must have verbal characteristics. However, there are several such lexical categories in Japanese. For instance, there are simplex and compound verbs (like *atukaw-u* ‘handle’ and *moriagar-u* ‘get excited’) as well as the so-called verbal nouns like *benkyoo-suru* ‘study.’ Additionally, verbs can be divided into inflectional classes. For example, the *te-iru* form that expresses progressive (or perfective) aspect differs in morphosyntactic behavior from the *renyoo*² form that can be combined with other suffixes to create temporal and pragmatic meanings. Although an explanation of the *tyuu* construction on the basis of lexical class was attempted by Kageyama, his argument leaves much room for dispute.

Kageyama classifies Sino-Japanese words and Native compounds as verbal nouns, and theorises that this category is what *-tyuu* subcategorizes for. Furthermore, he explains that the *renyoo* form of simplex verbs, although similar in surface form to the *renyoo* form of compounds, are not actually verbal nouns but pure verbs, and so cannot fill the slot for *-tyuu*.³ However, some speakers judge what appear to be simple *renyoo* forms as grammatical when combined with *-tyuu*. Among them are Ohta (1995), who gives the examples of *hodokosi-tyuu* and *korasime-tyuu*, (where both *hodokos* and *korasime* are native simplex verbs), both counterexamples to Kageyama’s claim. Although it is possible that not all native speakers of Japanese would find these phrases grammatical, the fact that they have some degree of grammaticality shows that it is impossible to simply conclude that only verbal nouns fit the subcategorization frame of *-tyuu*. Secondly, in some cases the honorific expression *o+[renyoo form]+tyuu* is grammatical whereas the *[renyoo]+suru* form is ungrammatical. These facts together seem to show that any explanation based on part of speech will neither accurately nor completely describe the actual combinatorial properties of *-tyuu*.

Indeed, the mere fact that the acceptability of a given verbal form can vary from speaker to speaker indicates that part of speech may not be the underlying issue. Although it is difficult to imagine a situation where a speaker may be unsure as to the part of speech of a particular word form, it is not difficult to imagine a situation where if some other (perhaps semantic) feature of a given word is unclear then the grammatical behavior of that word would vary from speaker to speaker. Below, I will attempt an explanation at some semantic characteristics of verbal forms in Japanese that may shed light on the variability and also define a class of words that can easily combine with *-tyuu*.

1.3 *tyuu*-construction and meaning

Although semantic elements may play a role in the *tyuu*-construction, it must be made explicit which types of elements are within the field of possibility—there are several types

²The *renyoo* form is created, in the case of consonant-stem words, by adding /i/ to the root. For vowel-stem verbs, the form of the *renyoo* form is identical to the form of the root. It is also called the “continuative” form, and frequently combines with politeness marker /masu/.

³In other words, compounds have *two* phonologically identical forms, *renyoo* and verbal noun, while simplex verbs have only the former.

	change	continuative	completive
state	-	+	-
achievement	+	-	+
activity	+	+	-
accomp	+	+	+

Table 1: Categorization of events by aktionsart features

not relevant to the study at hand. Subject animacy and other semantic features secondary to verbs themselves are unlikely directly related to the *tyuu*-construction. More likely, it is some fact surrounding the meaning of the verb itself that determines acceptability when in combination with *-tyuu*. Among the possible semantic features are aktionsarten, possibility of agency (that is, that the subject might carry out the action intentionally), and transitivity. Although it is possible that all three are related (and certainly it is arguable that they are all correlated), it seems that only aktionsart types are directly connected.

Aktionsarten do not actually talk about specific verb types, but about the events denoted by a verb and its arguments. A given event may depict a state, achievement, accomplishment, or activity, and there are three binary features that can be used to determine the event type. These are completedness, continuative, and change (see Table 1).

For the *tyuu*-construction to be grammatical, both the continuative feature and the change feature must have a value of [+]. Intuitively, *-tyuu* expresses an active, continuative process, and instantaneous or unchanging events (or states) do not fit its semantics well. This should be clear from the following examples:

- (4) (a) **sonzai-tyuu* ‘exist-TYUU’ (state)
 (b) **hakken-tyuu* ‘discover-TYUU’ **tootyaku-tyuu* ‘arrive-TYUU’ (achievement)
 (c) *sippitu-tyuu* ‘write-TYUU’ *denwa-tyuu* ‘phone[call]-TYUU’ (activity)
 (d) *sakusee-tyuu* ‘compose-TYUU’ *joohatu-tyuu* ‘evaporate-TYUU’ (accomplishment)

Verbs (more accurately, events) that are [- continuative] or [- change] like (4a,b) are not compatible with *-tyuu*. However, merely satisfying the condition that it must be either an activity or achievement does not guarantee grammaticality when combined with *-tyuu*. In other words, these are necessary but not sufficient conditions. For example, a phrase meaning nearly the same thing as *sippitu* ‘writing’ is *bun o kaku* ‘(lit.) write letters,’ but when used with the *tyuu*-construction the ungrammatical **bun o kakityuu ni denwa ga natta* ‘while writing, the phone rang’ results. Although the reasons behind this ungrammaticality will be discussed later, the important fact here is that aktionsarten constitute necessary but not sufficient conditions upon grammatical combination with the *tyuu*-construction.

Additionally, as can be seen in (4d) *joohatu-tyuu* ‘during evaporation,’ whether the subject has intention or not cannot be a factor in this construction. Although it is possible that

type	number	example
NV, verbal form exists	2	<i>mi-gamaeru</i> ‘stand ready’ (body-stand)
NV, no verbal form	5	<i>yama-nobori</i> ‘mountain-climbing’
VV, syntactic compound	4	<i>yomi-hajime-ru</i> ‘begin reading’ (read-begin)
VV, lexical compound	3	<i>kiri-kaeru</i> ‘switch’ (cut-change)
verbal form exists VV, lexical compound	2	<i>kui-nige</i> ‘eating without paying’ (eat-escape)
no verbal form TE-form compound	2	<i>tabete-miru</i> ‘try to eat’ (eating-try)
monomorphemic SJ	5	<i>has(suru)</i> ‘go out, start’
bimorphemic SJ	5	<i>ben-kyoo(suru)</i> ‘study’ (force-strong)
native causative	3	<i>tor-aseru</i> ‘cause to take’
native passive	3	<i>sukuw-areru</i> ‘be saved’
native, <4 moras	4	<i>kaku</i> ‘write’ (<i>renyoo</i> form <i>ka.k-i</i>)
native, ≥4 moras	3	<i>hodokosu</i> ‘give out’ (<i>renyoo</i> form <i>ho.do.ko.s-i</i>)
foreign loan	5	<i>enzyoi(suru)</i> ‘enjoy’

Table 2: Types of verbs occurring in the questionnaire with numbers of sentences and examples

many examples of the *tyuu*-construction involve an animate agent, from the fact that non-intentional verbs like ‘evaporate’ and ‘rise’ can be used with *-tyuu*, it can be concluded that intention of the agent is not a factor in determining grammaticality. In the same manner, it is clear that transitivity of the verb cannot be used to determine grammaticality.

2 Actual usage of the *tyuu* construction

Upon analyzing the *tyuu*-construction, it is utterly important to be clear on what types of verbs are actually compatible. As mentioned above, whether or not a given verb can be used in the *tyuu*-construction can vary from speaker to speaker. Because this sort of degree can exist in speakers’ judgements, it is not that great a leap to predict that the element that determines grammaticality also has some sort of inherent degree. However, in order to determine this, a questionnaire was conducted of several native speakers of Japanese. The form of the questionnaire was as follows.

Forty-nine sentences either constructed or found in text created by native speakers were presented to native speakers of Japanese. Subjects were asked to judge the grammaticality of each sentence on a scale of good-okay-bad. Of the 49 sentences, four did not contain the *tyuu*-construction, and acted as “control” sentences. These had clear grammatical errors or were semantically suspicious but syntactically well-formed. The remaining 45 sentences all contained the *tyuu*-construction, and each had one of the types of verbs listed in Table 2 (NV means noun-verb type compounds, VV means verb-verb type compounds; additionally,

0.11	TE-form compound
0.18	native, moras <4
0.20	passive
0.39	native, moras \geq 4
0.44	NV, verbal form exists
0.44	causative
0.44	VV syntactic compound
0.44	monomorphemic SJ
1.43	NV, no verbal form
1.44	VV lexical compound, no verbal form
1.57	foreign loan
1.58	bimorphemic SJ
1.59	VV lexical compound, verbal form exists

Table 3: Results of the questionnaire: Rankings according to parts of speech

unless otherwise noted all verb types indicate simplex forms; mora counts are from the *renyoo* ‘continuative’ form). Accompanying numbers are number of sentences appearing in the questionnaire.

The questionnaire was distributed to 21 people, and the results are summarized in Table 3. The numbers displayed in the table were reached at in the following way. First, each evaluation was given a numerical value (bad = 0, okay = 1, good = 2).⁴ Then the average value for each sentence as given by the subjects was calculated. Then, the sentences were grouped according to the class of verb that was in the *tyuu*-construction, and average of the values among each group was calculated. For example, there were three sentences with a native verb with causative morphology. The average (calculated) values for these sentences was 0.39, 0.56, and 0.22. The average of these three sentences is 0.44, and this number appears in the table below. In determining these values, we excluded the subjects who gave the highest and lowest values overall, and also excluded the results given by one subject who marked as “good” one control sentence with a clear grammatical error. Finally, in cases where no response was given (2 cases total), the remaining results were included in the calculations.

Two things are clear from the results in Table 3. First is that the numerical values have a range. That is, there is no clear binary distinction in grammaticality. Second is that despite the fact that there are degrees of acceptability, it is possible to divide the verb types generally into those that were quite acceptable and those that were not so acceptable. That is, between

⁴It would also have been possible to not assign numerical values to the qualitative responses given, and instead create a comparison chart based on the ratio of subjects who gave particular responses, but in fact the results are essentially the same. For the purposes of this paper, the numerical value method will be used.

“monomorphemic SJ” and “NV, no verbal form” there is a difference of 0.99, and it would seem that those ranked above “monomorphemic SJ” might be in the “grammatical” category and the others in the “ungrammatical” category. This distinction, of course, obscures the degree in acceptability that is also evident in the results. Any adequate explanation of these data must explain why there is this range of values, why the classes array themselves in this particular order, and why there seems to be a nice split down the middle.

3 Previous research

3.1 Ohta (1995)

Several attempts have been made to explain the *tyuu* construction. Ohta (1995) puts forth the following conditions:

- (5) The verbal element that comes before *-tyuu* must (a) Be a Sino-Japanese verbal noun, or (b) the root of a morphologically complex verb (corresponding to VV-type compounds in this paper), or (c) a verb whose root has 4 or more moras, or a combination of the above.

Ohta does not attempt a definition of “verbal noun,” but otherwise it is possible to test his hypothesis. There is one combination that Ohta’s explanation does not predict, and one combination that it does predict but that actually has a rather low level of acceptability. Looking at the results in Table 3, it is clear that NV-type compounds (no verbal form) have a relatively high level of acceptability. Of course, Ohta may not explicitly rule out NV-compounds in his analysis, but the lack of such examples may demonstrate that such compounds were viewed as inconsequential to the theory presented therein.

The second issue with Ohta’s (1995) analysis is the phonological restriction put forth that states that simple verbs with four or more moras are able to participate in the *tyuu*-construction. Ohta posits, without providing much motivation or supporting evidence, a phonological rule that governs a morphosyntactic process, and in particular one that deals with word length, something not often considered as a first explanation. Although that in itself constitutes a possible problem, the actual justification for this particular restriction may not be empirically founded. As can be easily seen from Table 3, even if a word satisfies the moraic restriction in question, that is no guarantee that the combination with *-tyuu* will be well-formed. In fact, there are several categories of verbs that fared better in the questionnaire compared to the native verbs with four or more moras. On the other hand, it is true that overall four-mora verbs were rated higher than three-mora verbs, and this remains to be explained. Although I will go into this topic later, it is likely that this particular phenomenon will not be easily explained by a simple “restriction” on word length.

3.2 Kageyama (1993)

In addition to Ohta (1995), Kageyama (1993) takes verbal nouns as his theme. Kageyama gives the *tyuu*-construction as an example of the verbal and nominal qualities present in

the class of words he calls verbal nouns.⁵ Essentially, he claims that the *tyuu*-construction (and others like it) subcategorize for clauses whose heads are verbal nouns (p. 32). Here, he defines verbal nouns as any expression that becomes a verb when the dummy verb *suru* is attached (p. 26). According to this definition, not only bimorphemic SJ words, but also VV-type and NV-type compound verbs would be included in this class. This would seem to agree with most of the results of the questionnaire.

However, Kageyama (1993) makes a stronger claim than “the complement must be a verbal noun.” He points out sentences like *manga o tatiyomi-tyuu (ni)* (‘while standing-and-reading comics’), which have as a main verb (or verbal element) a form that has no corresponding inflecting allomorph. He claims that this sentence (and others like it) are ungrammatical because the head verb in the clause called for by *-tyuu* must, in the case of compound verbs, be derived from a verb. However, words like *tati-yomi* do not have a corresponding verb (**tati-yom-u*), and so Kageyama calls these “caseless verbal nouns.” His claim is thus that *-tyuu* calls for a phrase headed by a “case-ful” verbal noun (pp. 33, 237). However, according to the results listed in Table 3, VV-type compound verbs that lack a verbal form (that is, are “caseless”) in fact have a rather high acceptance rating. For instance, (6) below was given an average rating of 1.5:

- (6) *manga o tatiyomi-tyuu ni tentyou ni donarareta*
 comic ACC stand-and-read-TYUU DAT store-manager DAT scold-PASS-PAST
 The store manager scolded us while we stood and read comics in the store.

The grammaticality of (6) shows that perhaps the caseless and careful distinction is not necessary. The explanation can be made consistent merely by saying that VV-type compound verbs, even those without verbal forms, have the ability to assign verbal case. Thus the only requirement set by the *tyuu*-construction is that its complement must be a verbal noun.

However, a problem remains with Kageyama’s (1993) analysis. That is, although most of the top five ranked categories in Table 3 are indeed verbal nouns, they are not all ranked as being perfectly acceptable, and in fact slight variation is apparant. First, the difference between the number-one ranked VV-type compound verb and the number-five ranked NV-type compound (no verbal form) is 0.19. This cannot be predicted by Kageyama’s explanation. Second, syntactic VV compounds and simplex native verbs with causative morphology, although not ranked as high as verbal nouns, fared much better than native verbs with passive morphology. This sort of cline is not predicted by Kageyama. As stated above, one cannot simply rely on parts of speech to explain the complementation pattern of *-tyuu*.

3.3 The Central Issue

Returning to the issue of possible semantic factors, I have established that one condition on participation in the *tyuu*-construction is that the verb combining with *-tyuu* must have

⁵The reason for this is that other verbs appearing in the *tyuu* construction cannot have any inflectional morphology, but they can nevertheless assign verbal case. This is a well-known phenomenon in Japanese, but is orthogonal to the concerns of this study.

a specific type of quality. Namely, it must have [+] values for both features [change] and [continuative]. However, these are not sufficient, but necessary conditions, and so there must be other factors involved. The issue here is exactly which data the analysis should be based on. That is, looking at Table 3, there is a cline in acceptability depending on *-tyuu*'s complement, and our analysis will necessarily change depending on where we view the range of acceptability to be. An ideal analysis would explain the entire range of values given, but it may be valuable to begin the explanation with those combinations ranked most acceptable. Once those constructions have been explained, the analysis developed may lead naturally to a more inclusive one that incorporates all the attested examples.

If we exclude the lower-ranked combinations from consideration, Kageyama's (1993) explanation seems adequate. The class of verbal nouns that take the dummy verb *suru* (SJ verbal nouns, native compound verbs, and foreign loans) may be exactly the class of verbs that can combine with *-tyuu*. However, one issue with this analysis is that the set of NV-compounds that can combine with *suru* is not completely identified with the set that can combine with *-tyuu*. For instance, *furi-komi* 'deposit' can combine with *-tyuu* but cannot combine with *suru*, and so cannot under this rubric be considered a verbal noun. Due to verbs like this, Kageyama's verbal noun explanation cannot hold for this construction.

However, the fact that the verbal noun explanation does not work for modern Japanese does not necessarily entail that it was never (historically) true. In fact, it may be the case that at the time when the *tyuu*-construction began to be used, there was such a restriction on its complements. The reasoning is as follows. At the point in time when Chinese vocabulary was beginning to be borrowed into Japanese, there was already a construction for compound verbs that parallels modern *suru* (it used an earlier form of the verb, *su*) (Sakazume, 1984). Then, when Chinese words (so-called *kango*, or SJ loans) were borrowed into Japanese, they too began to combine with *su*. The reason for this may be that most of the words borrowed from Chinese were themselves bimorphemic compounds. It may be that at this point, the class of words that verbalize with *suru* was created, and that in fact bimorphemic SJ words and native compounds have actually had a long history of similar syntactic properties. It would follow that if there were a property of "verbal-noun-ness," that it would be deeply related to compound-ness as well. In the following section I will develop this line of thought.

4 The central claims of this paper

Returning to the *tyuu* construction, we note that the Sino-Japanese origins of *-tyuu* are crucial. Although we expect that originally such SJ suffixes could only combine with other SJ words, due to the connection between verbal nouns and compounds, not only *-tyuu* but the dummy verb *suru* as well have come to be used commonly with native roots. In the following section I will use this fact alone to explain the top-five ranked classes in Table 3.

4.1 The Top Five Classes

First, three of the top five classes are in the category of native verbs, and the lowest-ranked of these is the NV-type compound, with a calculated ranking of 1.42, which is based on judgements of five sentences. (7) introduces three of these sentences.

- (7) (a) *niwa no mizu-maki-tyuu ni tonari no oziisan ga*
garden GEN water-spread-TYUU DAT next-door GEN old-man NOM
tazunete-kita. (1.61)
visit-come-PAST

While watering the garden the man from next door came to visit.

- (b) *mise-zimai-tyuu ni gootoo ga haitte-kita.* (1.50)
store-closing-TYUU DAT robber NOM enter-come-PAST

While closing up the store, a robber entered.

- (c) *yama-aruki-tyuu ni kuma ni deatta.* (1.50)
mountain-walking-TYUU DAT bear DAT encounter-PAST

[I] encountered a bear while walking in the mountains.

The numbers in parentheses are the calculated values based on accumulated native speaker judgements. Although even in these numbers there is some variation, these are clearly some of the most typical, acceptable examples of the *tyuu* construction.

Second, there are the VV-type native compounds. Both the types with and without verb forms ranked quite highly. Some examples are given in (8).⁶

- (8) (a) *denwa ni kiri-kae-tyuu ni, kirete-simatta.* (1.83)
telephone-call DAT cut-change-TYUU DAT cut-PERF-PAST

The line cut off in the middle of a telephone call transfer.

- (b) *manga o tati-yomi-tyuu ni, tentyou ni donarareta.*
comic ACC stand-read-TYUU at store-manager DAT scold-PASS-PAST
(1.50)

The store manager scolded us while we stood and read comics in the store.

Like the NV compounds seen in (7), these VV compounds also have a rather high level of acceptability. Like bimorphemic SJ loans, these words are made up of two semantic units (morphemes). However, since most of these compounds are also verbal nouns, at this point it is impossible to tell which factor is the crucial one. Although the mismatch between verbal nouns and *-tyuu* seems to hint that “compound structure” might be a necessary condition for participating in the *tyuu* construction, this analysis will have to wait until SJ loans and foreign loans are more closely examined.

⁶The auxiliary verb *sima(w)-* is glossed here as PERF, but it is also used to express regret at the event denoted by the main verb—in this case, the cutting out of the telephone

Thirdly, we have the category of bimorphemic SJ loans. These words are all made up of two bound morphemes. By that fact alone we might call them “compounds.” We might also follow Morioka (1969) in calling these bound morphemes “Chinese-character morphemes” (*kanji*-morphemes), but going that far is not necessary—based on Japanese speakers’ intuitions that SJ loans are made up of two semantic elements we can hypothesize that these are compounds. In fact, there is usually a specific grammatical relationship between the two bound morphemes, among them subject-predicate (*koku-ritu* country-erect, ‘run by the country’), modifier-modified (*koo-satu* cinch-kill ‘strangle’), verb-object (*doku-syo* read-book ‘to read’), and coordinate (*si-yoo* use-use, ‘to use’). This would seem to support the idea that these forms are indeed compounds.

- (9) (a) *mizu wa joohatu-tyuu ni, syuu no netu o ubau.* (1.83)
 water TOP evaporate-TYUU DAT surrounds GEN heat ACC take
 While the water evaporated, the surrounding heat was taken away.
- (b) *beekoku o hoomon-tyuu ni ree no ziken ga*
 America ACC visit-TYUU DAT that-certain GEN incident NOM
okotta. (1.89)
 occur-PAST
 While visiting America, the incident occurred.
- (c) *daitooryoo to aisatu-tyuu ni haigo de bakuhatu-on ga*
 president with greeting-TYUU DAT back LOC explosion-sound NOM
sita. (1.50)
 SURU-PAST.
 While greeting the president, in the background there was the sound of an explosion.

However, there are some bimorphemic SJ loans where the constituent morphemes do not exhibit argument-relation or coordinate relationships. Morioka (1969) gives several examples of words where the meanings that the ostensive parts contribute to the whole is not clear, or even where decomposition is nearly impossible. An example of the former is *tetu-gaku* ‘philosophy,’ where *gaku* means ‘study (of),’ but the *tetu* part has no discernable meaning of its own (in modern Japanese). An example of the latter we saw in (9b): the meaning of *ai-satu* ‘greet’ cannot be deduced from the bound morphemes that constitute it—indeed, one of these “morphemes” appears *only* in this word. In this case, there can be no doubt that the entire word *aisatu* must be listed in the lexicon as a single entry with its own non-compositional semantics. These types of non-compounds would seem to pose a problem for the compound analysis of the *tyuu* construction.

There is, in fact, another class of words that pose difficulty for the compound analysis—*gairaigo*, or foreign loans (those from languages other than Chinese). Regardless of whether they are composed of more than one morpheme or not, most of the words in this “class” can participate in the *tyuu* construction. In (10) three sentences with these loans are given. Like the mono-morphemic bi-syllabic SJ loans, these sentences pose a problem to our analysis.

(10) (a) *kyuuka o enzyoi-tyuu ni, ziko ni atte-simatta.* (1.50)
 vacation ACC enjoy-TYUU DAT accident DAT meet-PERF-PAST

While enjoying my vacation, I got into a (car) accident.

(b) *densya ga suto-tyuu na node basu de gakkoo ni itta.*
 train NOM strike-TYUU COP because bus with school DAT go-PAST
 (1.78)

Because there was a strike on the trains, I went to school by bus.

(c) *kare wa kanozyo to deeto-tyuu ni, kintyou site hito-koto*
 he TOP girlfriend with dating-TYUU DAT nervous doing one-word
mo hanas-e-nakat-ta. (1.83)

even speak-can-NEG-PAST.

While on a date with his girlfriend, he was worrying (nervous) so much that he couldn't say a single thing.

However, this does not mean that compound-ness is not related at all to the *tyuu* construction. Each of the top five categories from the questionnaire are either compounds, verbal nouns, or both. If we include the correlation with *suru*, we begin to see that there might be a deep connection between compounds and verbal nouns. Isii's (1987) work on the interchangeability of verbal nouns and compounds, as well as the semantic distributions of these two classes of verbs, hints at such a tight relationship.

In fact, looking ahead, there are other verbal categories that cannot yet be accounted for. In addition to SJ loans like *tetu-gaku* and *aisatu*, there are also monomorphemic SJ loans like *hat-* 'to utter, issue forth,' simplex native verbs with causative marking, and native verbs with roots longer than three moras long, each of which were given middle-range values (that is, not as high as the top five categories, but higher than several other categories, like TE-form compounds, verbs whose roots have less than 4 moras, and syntactic compounds). Though it will become clear later, analyzing these middle-ranked categories will lead to a natural explanation for the two "problem" categories above, monomorphemic SJ loans and foreign loans.

4.2 The Middle-ranked Verbal Classes

First, it is essential that we define what should be considered in this "middle-ranked" category. Here, I will consider the following classes to be middle-ranked, according to the results in Table 3: (1) monomorphemic SJ loans, (2) VV-type syntactic compounds, (3) simplex Japanese verbs with causative morphology, (4) NV-type compounds (verb form exists), and (5) simplex native verbs with four or more moras in the root. Is it appropriate to think of these as forming a group? Looking at the results in Table 3, the difference between the highest-ranked of this middle-ranked group (monomorphemic SJ loans) and the next-highest category (NV-type compounds) is 0.99; the difference between the lowest middle-ranked category (native verbs with ≥ 4 moras) and the next-lowest ranked category (passive form of

native verbs) is 0.19. In contrast, the difference between the two extremes of the proposed group is a mere 0.05. This would seem to be enough cause to, for now at least, think of these verb classes as forming some sort of group.

Although this numerically-based account may be convincing, there does not seem to be much formal similarity between these verb classes, other than the fact that they are verbs. Additionally, it does not seem as though the present analysis of compounds licensing a *tyuu* construction will correctly predict the acceptability of these verb classes. First, among these classes are clearly monomorphemic verbs. Although it may be up for debate as to whether “syntactic” compound forms are compounds or not, verbs like *hodokos-u* are clearly monomorphemic. The alternative explanation—that verbal nouns are the ones that license a *tyuu* construction—does not work either. The causative stem cannot combine with *-tyuu* (**tor-ase-suru* ‘take-CAUS-SURU’), nor can syntactic compounds like **denwa-sikake-SURU* ‘call-making-tyuu.’

4.2.1 Prototypes and Radial Categories

In order to explain the *tyuu* construction, it is necessary to introduce two concepts. These are the CLIMB-type prototype as put forth in Fillmore (1982) and radial categories (Lakoff 1987). After introducing these concepts, I will go on to analyze the middle-ranked group with them in mind. I will then further show that the top-five ranked categories can also be accounted for using these two concepts.

The climb Prototype Fillmore (1982) puts forth six types of semantic prototypes, one of which is based on the word *climb*. This type of prototype is defined as a “disjunction of mutually compatible conditions,” where the best example would fulfill both (all) of the conditions (p. 32). The conditions given by Fillmore for *climb* are (paraphrasing) “using the arms and legs” and “upward motion.” For instance, although an airplane lacks arms and legs, while it has upward motion that motion can be described with *climb* (if it is not moving up then the use of *climb* is not licensed). On the other hand, a monkey’s motion up or down a flagpole can be described by *climb* because the monkey would be using arms and legs regardless of directionality. Essentially, as long as one or both of these conditions are satisfied then the usage is allowed.

Radial Categories Radial categories are a widely accepted type of category extension. In this type of category extension, each category has central members and peripheral members (Ōhori 2002, 32-34). The central members constitute the “prototype.” A radial category is a category such that the direction of extension has many paths (p. 45). To give a Japanese example, the classifier *hon* is prototypically used for items that are thin, long, and cylindrical. However, there are other, more peripheral uses, and these are all systematically related to the prototypes. By the conduit metaphor of communication, we have uses like *denwa o ippon kudasai* ‘give me one telephone call,’ and from the idea that a batter’s bat or a swordsman’s sword is long and thin we have *hoomuran 60-hon* ‘60 homeruns’ and *ip-pon kati* ‘one-hit victory.’ From this the category extends even further, from swordfighting to

martial arts in general, so that *ip-pon kati* can now be used for sports that do not even have weapons like *karate* and *jūdō*. This is the result of radial category extension (Ōhori 2002: p. 88-89; Corston-Oliver 2001). Furthermore, although the above example dealt with a radial category in the lexicon, the idea can be similarly applied to other parts of the grammar, such as parts of speech and syntactic structures (Ōhori 2002: p. 34).

4.2.2 The Diachronic Relationship between Verbal Nouns and Compounds

Before we consider the the data for the middle-ranked group, it is important to examine the historical developments of the verbal noun and the compound verb, at least in part. Although it was mentioned in section 4.3, at one point in time there was a category called “verbal noun,” and its members were native compounds and monomorphemic and bimorphemic SJ loans. It is unlikely that at that time there was a construction anything like the modern *tyuu* construction. However, perhaps at an even earlier time what is now a single “verbal noun” category was in fact two separate categories. At the time when Chinese words were beginning to be used, the telltale sign of verbal nouns (the *su* dummy verb) was already in use with native compounds,⁷ and *tyuu* could only combine with words of Chinese origin.

However, there is still the question of how Chinese loans came to be used in the same construction as native compound words. The following may be a plausible explanation: Contemporary Japanese speakers felt a commonality between compounds and new Chinese loans—most of the words borrowed from Chinese were in fact compounds, and speakers may have treated such compounds exactly as Japanese compounds, at least to the degree that Japanese grammar would allow. Indeed, there is evidence pointing to a closer relationship between Chinese loans and compounds in the past. To give one example, in modern Japanese native compound verbs have both verbal noun usages (combining with *-suru*) as well as verbal usages (taking verbal suffixes like monomorphemic verbs). In contrast, SJ loans have only the verbal noun use, and must combine with *suru* to be used as the predicator of a matrix clause. However, in the distant past native compound verbs *only* had the verbal noun use (for instance, *mono-gatari-suru* but **mono-gatar-u*) (Itoi 1985: p. 130). In other words, at one point both Chinese loans and native compound verbs could only be used as predicators when combined with the dummy verb. In modern Japanese these two categories may have separated a bit, but their connection is certainly historically motivated.

4.2.3 Application of the Concepts

If we posit compound verbs (or, more accurately, “compound-ness”) and verbal nouns as the two axes in a CLIMB-type prototype, which itself is positioned as the central member of a radial category, it would look something like Figure 1.

The left oval represents the verbal noun category, and the right oval represents the compound word category. The circles outside the prototype represent the nonprototypical cat-

⁷Although it is unclear when the *su* construction came into use, at the time when Chinese was used only in formal writing (that is, in official documents written entirely in Chinese), the dummy verb *su* was being used with native compounds.

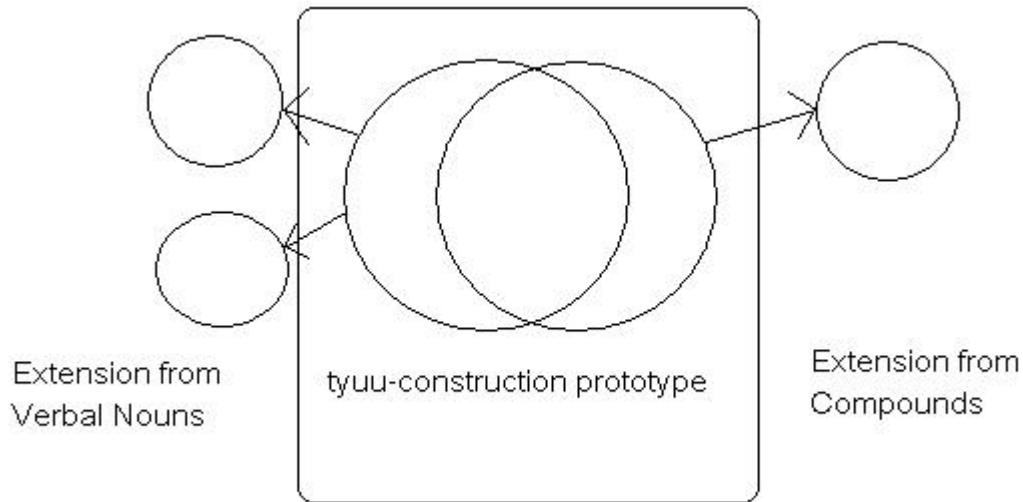


Figure 1: The prototype and radial extension of the *tyuu* construction

egories that can participate in the *tyuu* construction. The arrows represent the direction of category extension. For each of the categories there is a set of independent features, and the more prototypical instances have positive values for more and more features. We would then posit that what licenses a *tyuu* construction is a member of this radial category. Concretely, the features are something like the following:

- | | | |
|------|--------------|---|
| (11) | Compounds | Multiple semantic elements (morphologically complex)
Argument or Coordinate relationship between semantic elements
Phonologically long (2 or more feet) |
| | Verbal Nouns | Multiple semantic elements
Can only be used as a predicator with dummy verb <i>suru</i>
Strict phonotactics on syllable structure |

What is important here is to realize that these are not the definitions of categories, but rather specific features that prototypes of these categories have. They can be thought of as the basis for category extension.

Already the rationale behind the top-ranked categories in Table 3 is more apparent. NV-type (no verb form) and VV-type compounds are all contained within the ‘compound’ category. Some of these also belong to the verbal noun category, but according to the definition of CLIMB prototypes, this is not a problem. Additionally, bimorphemic compounds (both the compound verb variety and the *aisatu* variety) fall within the “verbal noun” category, and some of these fall within the “compound” category, and by the same reasoning used for the compounds, we can predict that these verbal classes will also license a *tyuu*

construction. Next, because foreign loans (*gairaigo*) also fall within the category of “verbal noun,” they too can participate in the *tyuu* construction. Finally, we would predict that because these verbal classes fulfill most of the features in (11) that they would have a higher rate of acceptance in a construction that calls for a member of this particular category—this is in fact the case.

We will now turn our attention to the data for the middle-ranked group.

4.2.4 Data and Analysis of the Middle-range Group

First, there are the sentences that contain causatives of native simplex verbs.

- (12) (a) *tomodati ni uta o kik-ase-tyuu ni, nodo no tyousi*
 friend DAT song ACC hear-CAUSE-TYUU dat throat GEN condition
ga okasiku natta. (0.44)
 NOM strangely become-PAST

While making my friend listen to a song, my throat began to feel odd.

- (b) *zyousi ga buka ni kopii o tor-ase-tyuu ni, moo*
 boss NOM subordinate DAT copy ACC take-CAUSE-TYUU dat already
kuraianto ga yattekite-simatta. (0.44)
 client NOM come-PERF-PAST

As the boss was making his subordinate make copies, the client arrived.

- (c) *akamboo ni miruku o nom-ase-tyuu ni denwa ga*
 baby DAT milk ACC drink-CAUSE-TYUU DAT phone NOM
natta. (0.44)
 ring-PAST

While making the baby drink milk, the phone rang.

In general, the causative has the meaning “to bring about a state of affairs, or affect someone or something such that they act in a certain manner.” The Japanese “causative,” has two meanings—the “permissive” causative (roughly *let*) and the “inducing” causative (roughly *make*). However, in the questionnaire conducted this distinction was not made; it will not be considered here. Nevertheless, both types of causative increase the valence of the verb by one argument (the causer), thus creating a verb with a rather different meaning than the bare root. In other words, the causative adds significant semantics to the verb. In this aspect, there is a similarity between causatives and compounds via the “multiple semantic elements” feature that is prototypical of compounds. Combined with the fact that adding causative morphology increases the length of the form, it is easy to see how verbs with causative morphology could be construed as peripheral members to the compounds category. As such, they can participate in the *tyuu* construction.

Interestingly, verbs with causative morphology were calculated to have a level of acceptability which is twice that of verbs with passive morphology (see 13 for examples). This is most likely due to the fact that on the one hand the causative has some sort of independent meaning, and creates a new verb with aspects of meaning from both the root and the

causative morphology, whereas the passive suffix cannot be said to contribute much meaning on its own. Rather, its primary function is to change the perspective on the event depicted by the verb. Speaking loosely, there is essentially no difference between the (possible) events depicted by an active sentence and a passive paraphrase. A monomorphemic verb with passive morphology, in contrast to one with causative morphology, is not sufficiently similar to any of the prototypical members as to license the *tyuu* construction.

- (13) (a) *nanmin ga gun ni sukuw-are-tyuu ni, mata teki no*
 refugee NOM army DAT rescue-PASS-TYUU DAT again enemy GEN
koogeki ga atta. (0.18)
 attack NOM be-PAST

While the refugees were being rescued by the army, there was another enemy attack.

- (b) *sono kameraman wa gerira ni torae-rare-tyuu ni suu*
 that cameraman TOP guerrilla DAT take-PASS-TYUU dat several
hyaku mai no syasin o totta. (0.22)
 hundred CL GEN photograph ACC take

While being taken my guerrillas, that cameraman took several hundred photographs.

Second, let us examine the acceptability of monomorphemic SJ loans. (14) introduces the three sentences used in the questionnaire.

- (14) (a) *yakuhin o nessi-tyuu ni doku-gasu ga dete-kita. (0.78)*
 medicine ACC heat-tyuu DAT poison-gas NOM emerge-come-PAST

While heating the medicine, a poison gas escaped.

- (b) *soonann-singoo o hassi-tyuu ni tuusinki ga kowareta. (0.72)*
 distress-signal ACC send-TYUU DAT transmitter NOM break-PAST

While sending a distress signal, the transmitter broke.

- (c) *+kyoku to -kyoku ga sessi-tyuu ni, bakuhatu ga*
 positive-pole and negative-pole NOM contact-TYUU DAT explosion NOM
okita. (0.39)

occur

While the positive and negative pole were in contact, there was an explosion.

Although there is quite a difference in values, these verbs seem to form a single class. In particular (14c) requires attention. It may be possible that semantic or pragmatic factors may have contributed to its low rating. If monomorphemic SJ loans are already in a middle-range status with regards to the *tyuu* construction, any semantic anomaly in a sentence is likely to render the sentence odd as a whole. It may be the case that (14c) was ranked low because of this.

The participation of the verb class exemplified in (14) is perfectly predictable by our theory—just like the causative forms in (12), it is by category extension that this usage emerged. This time it is not compound-ness but verbal noun quality that led to the extension. Although the “multiple semantic elements” feature does not fit, the remaining two do. Monomorphemic SJ loan words are subject to strict phonotactics (monosyllabic roots, only [p t k] in the coda position), and they are always accompanied by a suffix-like element that is very similar to the dummy verb *suru*.⁸ By this similarity the connection to the verbal noun category is formed and strengthened, and the usage in the *tyuu* construction is licensed.

What is crucial to notice here is that monomorphemic SJ loans became a peripheral member of the category due entirely to similarity to verbal nouns, and that they bear little or no resemblance to compounds. However, this is not a problem for radial categories—in fact, it is predicted by the model. Radial categories extend in several directions, and as long as there is a link from one member to the next, there is no need for similarity directly between peripheral and prototypical members (Ōhori 2002: p. 46). If we recognize this fact, then the above explanation becomes possible.

Thirdly, there is the middle-ranked group of simplex native words with four or more moras in their root form. (15) gives two examples:

- (15) (a) *uti no mise ga kako 5 nen kan nasyonaru no seehin*
 inner GEN store NOM past year period National GEN product
o atukai-tyuu, itido mo kuzuyoo ga arimasendesita.
 ACC handle-TYUU once even complaint NOM exist-FORMAL-NEG-PAST
 (0.39)

During our store’s five years of dealing with National products, we have not had a single complaint.

- (b) *oboosan ga kikin de komatteita mazusii noomin ni okome*
 monk NOM starvation LOC troubled poor farmers DAT rice
o hodokosi-tyuu ni megumi no ame ga futte-kita. (0.56)
 ACC give-TYUU dat blessed GEN rain NOM fall-come-PAST

While the monk was handing out rice to the starving, poor farmers, a blessed rain began to fall.

Through the feature “phonologically long,” four-plus mora words connect with the prototype category of compound words, and thus can be used with *tyuu*. However, there are no other common features with any of the other members of the category, and further the feature “phonologically long” is not without its exceptions, even among some of the prototypical cases. It is likely due to this slightly tenuous relationship that the level of acceptability for this class of verbs was so low.

⁸In this paper I define monomorphemic SJ loans to consist of a monosyllabic bound morpheme and the dummy verb *suru*. For details on the difference between monomorphemic and bimorphemic loans, and various subtypes of each, see Sakazume (1984) and Poser (2002).

The remaining categories are syntactic compounds⁹ and NV-type compounds (verbal forms exist). These two categories require special treatment in our analysis.

First, let us examine syntactic compounds. Although in Table 3 they seem to be a middle-range group, each sentence must be looked at individually.

- (16) (a) *denwa si-kake-TYUU ni, tomodati ga heya o tazunete-kita.*
 telephone do-hang-tyuu DAT friend NOM room ACC visit-come-PAST
 (0.06)

While in the middle of making a telephone call, my friend came into my room.

- (b) *amerika to soren ga koogeki si-ai-TYUU ni,*
 America and Soviet Union NOM attack do-RECIP-TYUU
ahuganisutan no minsyuu ga hooki sita. (0.28)
 DAT Afghanistan GEN people NOM riot do

While America and the Soviet Union were attacking each other, the people of Afghanistan rioted.

- (c) *watasi wa benkyoo si-hajime-tyuu ni zyuubun ni syuutyuu*
 1sg TOP study do-start-TYUU DAT sufficient DAT concentrate
dekinai to nakanaka susumanai. (0.06)
 cannot if not-well progress-NEG

If I can't concentrate enough while in the middle of beginning to read, I don't make much progress.

- (d) *yotee o kakunin si-naosi-tyuu na node, mada go-henzi*
 plan ACC check do-redo-TYUU COP because yet HUM-reply
dekimasen. (1.59)
 cannot-FORMAL

Because I am still in the middle of rechecking the plan, I cannot get back to you yet.

Quite clearly, sentences containing syntactic compounds combined with *tyuu* do not have uniform acceptability.

At first glance, it is possible to divide these compound verbs into those that have aspectual meanings (16a,c) and those that do not. Those that have aspectual meanings probably conflict with the aspectual meaning that *tyuu* contributes to the construction, and so their grammaticality goes down. In contrast, the reciprocal verb *aw-u* and 'redo' verb *naos-u* seemed to combine fairly well with *tyuu* (quite well in the case of *naos-u*). Exactly why there was such a difference in grammaticality between the two non-aspectual compound verbs (in (16b,d)) is not clear. At this stage a reasonable explanation does not seem possible.

⁹There are generally two types of compound verb structures recognized in Japanese, lexical and syntactic. The basis for distinction is usually given as semantic—lexical compounds have idiosyncratic and/or ambiguous meanings, whereas syntactic compounds are basically compositional. For further discussion see Kageyama (1993).

The final group in the mid-range verbs is NV-type compounds (with verb forms). Although such verbs were common previously, in modern Japanese they are relatively rare compared to other types of compounds. The two examples used in the questionnaire are reproduced in (17).

- (17) (a) *aite no koogeki ni taisite mi-gamae-tyuu ni, sisyou no kotoba o omoidasita.*
 opponent GEN attack DAT facing body-stand-TYUU DAT teacher GET
 words ACC recall-PAST.

As I prepared to face my opponent's attack, I remembered the words of my teacher.

- (b) *dekakeru zyunbi ni tema-dori-tyuu ni, denwa ga kakatte-kita node iraira shita.*
 go-out preparation DAT effort-take-TYUU DAT telephone-call NOM
 hang-come-PAST because frustrated do-PAST

While I was working on departing preparations, a phone call came, irritating me.

The placement of NV-type compounds (with verb forms) in the middle-ranked category is not predicted by the model so far. As they have fully-fledged verbal forms they have a link to VV-type compounds, and as they are NV-type are linked with NV compounds without verbal forms. Thus they should be in the higher-ranked group, not the middle-ranked one. Although this cannot be completely and satisfactorily explained at this point, it seems likely that the point touched on above is relevant. Namely, these types of verbs are very uncommon in modern Japanese (and those that do exist are rarely used, or sound archaic), and so many native speakers may not feel as comfortable with them as with other types of verbs. In other words, these types of verbs may be readily judged to be in semantically odd sentences just due to the fact that they are not very common. Obviously, further study is necessary to determine the exact factors involved here.

4.3 The Low-ranked group

Finally, we turn to an explanation for the final, lowest-ranked verbal classes, namely passives, native simplex verbs with less than three moras, and TE-form compounds. In the previous section, an explanation was provided for the ungrammaticality of passives, so here we will focus on the other two categories ((18a,b) and (18c,d) are examples of simplex verbs with less than three moras and TE-form compounds, respectively).

- (18) (a) *sono ronbun o kaki-tyuu ni, atarasii kenkyuu tema o omoituita. (0.28)*
 that thesis ACC write-TYUU DAT new research theme ACC
 think-up-PAST.

While writing that thesis, I thought of a new research theme.

- (b) *kono undoo-sisetu o tukai-tyuu ni wa, teekiteki ni karada*
 this exercise-facility ACC use-TYUU DAT TOP periodically DAT body
no tyousi o tasikamete-kudasai. (0.06)
 GEN condition ACC check-please

Please check your body conditions periodically while using this exercise facility.

- (c) *nihon-syu o non-de-mi-tyuu ni, yopparatte-simatta.*
 japan-liquor ACC drink-TE-try-TYUU DAT become-drunken-PERF-PAST
(0.06)

I got drunk while trying (to drink) Japanese liquor.

- (d) *tomodati ni syukudai o tetudat-te-morai-tyuu ni iroiro na*
 friend DAT homework ACC assist-TE-get-TYUU DAT various COP
hanasi o sita. (0.17)
 story ACC do-PAST

While getting my friend to help [me] with homework, we talked about various things.

The former is easily explained. Because these words are simplex *and* short, they have no connection to the compound category, and neither do they have properties common to verbal nouns. Because there is no way to connect these verbs to the *tyuu* construction prototype, these sentences are ungrammatical.¹⁰

However, the reason for the ungrammaticality of so-called TE-compounds is different.¹¹ Although not present in (11), there is another feature common to both compounds and verbal nouns, which is that they both constitute single lexical items—everything discussed so far, from VV-type lexical compounds to monomorphemic, disyllabic SJ loans have been single “words.” Even syntactic compounds, which are not generally analyzed as being under a single terminal node in the underlying syntactic structure, end up under a single terminal node after syntactic processes apply. In contrast, so-called TE-compounds never, at any level of analysis, pass tests for compounding (Kageyama 1993: 170). That is, even after syntactic processes are over, TE-compounds still do not constitute a single word. With this in mind, simply adding a proviso to the conditions for participation in the *tyuu* construction—the complement must be a single word—will explain this phenomenon.

¹⁰Although phrases like *hanasi-tyuu* ‘while speaking’ and *yasumi-tyuu* ‘on vacation’ might seem at first glance to be examples of the *tyuu* construction, there is good reason to believe that these entities are rather different from the type discussed here. Ohta (1995: 87-88) has a detailed discussion.

¹¹TE-compounds are constructions with one main verbal element in the TE (participial) form, followed by an auxiliary verb like *iru* ‘be,’ *miru* ‘try,’ *ageru* ‘give’ to give various meanings (progressive aspect, trial, and benefactive respectively for these three examples).

5 Conclusions

This paper began with the question of how the lexicon of Japanese should be organized. In particular, we looked at whether or not concepts like *part of speech* and *gosyu* could explain certain morphosyntactic phenomena. Although an attempt was made to search for any necessity for such concepts, ultimately it was determined that when explaining constructions like the *tyuu* construction, it was necessary to call upon concepts developed in the cognitive sciences like prototypes and radial categories.

In the previous section an explanation for the combinatorial properties of *-tyuu* was made that combined two previously unrelated concepts. First, it was claimed that what can license a *tyuu* construction has some sort of prototypical property. However, the prototypes of the *-tyuu* complements were not claimed to be a salient example, or an abstraction, or a list of features. Instead, the prototypes were a specific type of prototype exemplified by *climb* as put forth in Fillmore (1982). This prototype, which has by nature two main aspects, combined features of compound verbs and verbal nouns. The central lexical classes (i.e., the ones that most easily combine with *-tyuu*) have most of the properties of both of these prototypes, and the peripheral members (the “mid-ranked” classes) were connected to the prototype through a radially-extended network.

Although throughout this paper I have used the term *verbal noun*, I have avoided the traditional term *kango*, or Sino-Japanese loan word. Although positing a category with the same name as a part of speech was necessary, what is important is that the ultimate explanation relied on a higher category (the CLIMB-type prototype). Although historically the borrowing of Chinese words has left some mark on Japanese grammar, and there may be some tendencies that trace their origins to this stage of borrowing, this paper has shown that it is not necessary to explicitly posit etymological information, at least in explaining the *tyuu* construction.

6 Future Topics of Research

There were several topics and issues that surpassed the scope of this paper. First, it is clear that even among verbal forms in the same class there is some variation in acceptability. Even in the highest ranking classes some variation was present, and it becomes more apparent when examining the middle-ranked verbal classes. Although I have been working under the assumption that the reason for this, at least in the middle-ranked verbal classes, is that the relationships between them and the prototypes is either distant or vague, further research is necessary to tease apart these differences.

Second, although it was briefly mentioned above, the drastic differences in acceptability between NV compounds that have verb forms and those that do not has not been satisfactorily explained. Additionally, although it is possible that even among syntactic compounds there is a basic difference between those like *aw-u* RECIP and *naos-u* ‘redo,’ it is also possible that the data gathered for this paper do not accurately or completely represent the distributions and acceptability levels of such compounds.

Finally, there are several avenues of research that could not be taken due to time limitations. For instance, it is possible that words which were originally compounds but are now considered by native speakers to be simplex words have a higher (or just different) acceptability than originally-monomorphemic native verbs. Verbs like *katadoru* ‘to take a form’, *mitomeru* ‘to recognize’, and *uketamawaru* ‘to receive, accept,’ are among the candidate verbs for such a study. In particular, *uketamawari-tyuu* is an often-seen usage (in store windows where reservations are being accepted, for example). Additionally, further combinations like causative and passive forms of bimorphemic SJ loans should be worked on. Finally, there is the issue brought up in section 2.2, namely that the honorific/humble construction *o+[renyoo form]+tyuu* sometimes licenses the *tyuu* construction where it might not ordinarily be available.

- (19) *MSN no disukusupeesu o o-tukai-tyuu ni, tugi no yoo na*
 GEN disk-space ACC HON-use-TYUU ni following GEN like COP
messezi ga hyouzi sareru baai ga arimasu.
 message NOM display do-PASS case NOM exist-FORMAL

While using MSN’s disk space, there are cases where something like the following message may be displayed.

Although such examples were not included in the questionnaire conducted for this paper, based on the frequency of this type of construction, it would seem to be a regularly accepted use of *-tyuu*. The analysis developed herein can account for this usage. Leaving aside the question of what sort of constituent *o+[renyoo form]+tyuu* might be, it is clear that it contains two separable semantic elements, and so can be connected to the compound radial category. However, it might seem that this is similar to the case of the passive, because adding honorifics and similar elements does not change the nature of the denoted event. Though this is true on one level, there is reason to believe that honorific and humbling expressions are different, because the possible arguments of a verb with one of these elements lessens. For instance, in the case of an honorific use of *o-tukai-tyuu* the subject cannot be the speaker. However, without further study and determination of productivity and acceptability of this particular construction, it may not be possible to reach a conclusive explanation. Nevertheless, the fact that this and other related issues remain certainly suggests that the study of the structure of the lexicon still has a long future.

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