Macrothink Institute™

International Journal of Linguistics
ISSN 1948-5425
2019, Vol. 11, No. 5

A Phonological, Morpho-Syntactical Study of Nominal Compounding in Japanese

Wenchao Li

Department of Japanese Studies, Zhejiang University

Zhejiang, China

E-mail: widelia@zju.edu.cn

Received: July 31, 2019 Accepted: August 19, 2019 Published: October 8, 2019

doi:10.5296/ijl.v11i5.15185 URL: https://doi.org/10.5296/ijl.v11i5.15185

This paper is based on work that was supported by the National Foundation of Social Sciences (15CYY002) as well as the Humanities and Social Sciences Research Programme of Zhejiang University to Wenchao Li.

Abstract

This paper provides a distributed-morphological analysis of nominal compounding in Japanese in an effort to pin down the phonological, morphosyntactic mechanism in nominal compounding. The findings reveal that the semantic relation between the N_1 and N_2 has seven variations: Object + Tran.$_{CONJ.}$; Instrument + Tran.$_{CONJ.}$; Modifier - Tran.$_{CONJ.}$; Place - Tran.$_{CONJ.;}$ Method - Tran.$_{CONJ.;}$ Cause - Tran.$_{CONJ.;}$ and Subject –tran. $_{CONJ..}$ Among the variations, sequential voicing is only subject to [N_{OBJECT} - $N_{TRAN.conj.}$] nominal compounds. Moreover, during the process of forming a nominal compound, the second constituents (N_2) rendered by aspirate consonants /*k*/ and /*t*/ are very likely to receive sequential voicing. When the N_2 is conveyed by consonant /c/ and fricative consonant /*h*/, sequential voicing does not occur. Syntactically, Japanese nominal compounds are all right-headed. The formation process of all nominal compounds is a matter of 'word derivation' given the fact that, (i) √Root and the latter added morphemes are not semantically associated and it is after the merger that the semantic interpretation is established, and (ii) the N-N's category is determined by the added morphemes. In addition, lexicalisation plays an essential role during the nominal compounding process. Crucially, lexicalisation only applies to the [N_{OBJECT} - $N_{TRAN.conj.}$] type of compound.

Keywords: Japanese, Nominal compounds, Phonology, Morphology

1. Introduction

In the compounding form [X N], X can be an A(djective), a V(erb), a P(reposition) or a N(oun). An illustration is given in (1):

(1) a. A N black horse
b. V N sitting room
c. P N outlook
d. N N lipstick

In Japanese nominal compounds [N_1 N_2], N_1 can be a modifier of N_2 (2a), an object of N_2 (2e), or an instrument of N_2 (2c). N_1 and N_2 can also be a parallel nouns (2d).

(2) Japanese

a. *kaeru* 'frog' → *ama* 'rain' + **ka**eru *ama**ga**eru* 'tree frog'
b. *tsubushi* 'crush' → *jikan* 'time' + tsubushi *jikantsubushi* 'time killing'
c. *tsukuri* 'make something' → *te* 'hand' + **tsu**kuri *te**du**kuri* 'hand-made'
d. *ko* 'child' → *oya* 'parent' + ko *oyako* 'parent+child'

With regard to Japanese noun-noun compounding, two issues are particularly worthy of discussion. First, the majority of N_2 nouns are derived from transitive verbs; they are 'conjunctive forms' (連用形) of transitive (or partial intransitive) verbs. In this sense, they differ from the nominalisation strategy of English verbs, which derive into nouns via the gerund form. A comparison of English and Japanese verb nominalisation is provided below.

(3) a. Japanese: *ugoku* → *ugoki* (conjunctive form of *ugoku*)
English: move → moving (gerund form of *move*)
b. Japanese: *tsukau* → *tsukai* (conjunctive form of *tsukau*)
English: use → using (gerund form of *use*)

The second issue is that, when the N_1 and N_2 are assigned in a modifier-noun relation (N_1 modifiers N_2, cf. (4a)) or instrument-noun relation (N_1 acting as an instrument, cf. (4c)), the voiceless consonants of the second noun usually turn into voiced consonants.

(4) a. *soko* 'bottom' → *ake* 'raise' + ***s**oko* ake**z**oko 'raised bottom'
b. *tatami* 'straw mats' → *ao* 'blue' + ***t**atami* ao**d**atami 'new mats'
c. *ha* 'tooth' → *mushi* 'decay' + ***ha*** mushi**ba** 'decayed tooth'

In Romance languages (unlike Germanic and Altaic, where the modifier noun generally comes before the N_2) it is common to see a prepositional phrase acting as a modifier. To put it another way, the modifier noun comes in last, i.e. N $N_{modifier}$. An illustration is provided in (5):

(5) ‘chocolate cake’ in French would be ‘gateau *au* chocolat’, where *au* is a preposition.

Italian, another Romance language, presents a similar pattern:

‘Chocolate cake’ in Italian would be ‘torta *al* cioccolato’. Here, *al* is the compound of the preposition *a* (to) + article *il*.

In German, when combining two lexicons, morphologically they turn into a one-word lexicon. This may explain why German nouns are particularly long, e.g. Sprachwissenschaft.

Intriguingly, when two German nouns are combined, morphologically, five types of alternations occur, as can be seen in (6).

(6) a. noun-noun compounding without morphological change.

e.g. *Mittag-essen* ‘luncheon’
b. when the N_1 ends with morpheme ‘-e’, then ‘-e’ must be omitted during the compounding.

e.g. *Schul-jahr* ‘school year’
c. The morpheme ‘-e’ is inserted between the two lexicons.

e.g. *Bad-e-anzug* ‘swimsuit’
d. The morpheme ‘-s-’ or ‘-es’ is inserted between the two lexicons.

e.g. *Volk-s-Wagen* ‘auto car’
e. When the N_1 ends with the morpheme ‘-e-’, then such morpheme should be replaced with the morpheme ‘-s-’.

e.g. *Hilf-s-kraft* ‘temporary worker’

Compounding has been addressed extensively in linguistic typological work in terms of varieties and formation processes. A number of efforts have been made to address how to define a nominal compound (Aikhenvald 2007, Bauer 2009, Lieber and Štekauer 2009, Romero-Méndez 2008, Scalise and Vogel 2010). In earlier times, two approaches were put forward (cf. Bauer 2006): (i) the syntactic approach, defining compounds as a construction issue, and (ii) the lexical approach, defining compounds as a lexical unit. The syntactic approach may successfully account for verb compounds and deictic compounds. This attempt appears to have had a significant influence on verb compounding (V-V) in Japanese. The Japanese linguist Kageyama (1993), meanwhile, considers Japanese V-V formation to have two variations: syntactically formed V-Vs ([… [… Obj V1] V2]) and lexically formed V-Vs ([… Obj [V V1-V2]]).

Aikhenvald (2007:24) tries to put forward a more universal account, asserting that compounding refers to the combination of at least two potentially free forms, and nominal compounding results in the creation of new nouns.

A different approach to compounding comes from Lieber and Štekauer (2009:6–7), who demonstrate three criteria: (a) stress and phonological patterns; (b) the behaviour of the compound with respect to inflection; and (c) syntactic impenetrability. However, these

criteria are not cross-linguistically applied; languages without morphology do not obey this criteria. An immediate example that springs to mind would be Chinese. As an isolating language, Chinese lacks a versatile inflection system and, as a result, tense, aspect, voice and modality are expressed by particles or by word order. The lack of morphology gives rise to hardship in category identification. For instance, in the compound noun 断桥 *duàn qiáo* 'broken bridge', should 断 be regarded as an adjective or a verb in its participle form, given the fact that 断 has multiple faces (cf. Li 2018)?

Further notable work on the study of compounding can be found in Booij's *Construction Morphology* (2010). Following his insights, the general schema for compounding $[X\ Y]_Y$ is an abstract schema at the top level, which dominates the more specific schemas for nominal or adjectival compounding ($[X\ N]_N$ and $[X\ A]_A$ respectively). The next level is formed by schemas which include the specification of the first constituent, such as noun-noun compounding, adjective-noun compounding and verb-noun compounding.

In terms of nominal compounding, Jackendoff (2009; 2010) worked on English noun-noun compounds within the framework of *Parallel Architecture* and contends that Germanic nominal compounds are highly productive and semantically idiosyncratic.

The approaches that have contributed to compound-hood so far are summarised in Figure 1.

Syntactic approach (headedness)

↓

Lexical approach

↓

Parallel Architecture

↓

Construction Morphology

Figure 1. Approaches adopted in the study of compound-hood

Previous studies across different languages have made valuable contributions to our understanding of the criteria of compounding. However, given the typological distinctions in different language families, these studies do not seem to have successfully reached a mature definition of compound-hood. This study analyses data from Japanese in an effort to develop a typology within the 'distributed morphology' framework. It also aims to pin down cross-linguistic universalities of nominal compound formation by looking into issues of phonological constraint, morphological principle and semantic compositionality.

The data for the Japanese compounds comes from the corpus 'The Japanese Lexicon: A Rendaku Encyclopedia' by the National Institute for Japanese Language and Linguistics (https://pj.ninjal.ac.jp/rendaku/en/).

The rest of the paper is mapped out as follows. Section 2 sheds light on the 'distributed morphology' framework, then Section 3 will conduct a corpus-based analysis looking into (a) the phonological issue: stress and sequential voicing, and (b) the morphosyntactic issue: headedness.

With this in place, we will arrive at a clearer idea of the relation between the N_1 and N_2, as well as the degree of lexicalisation. Section 4 draws on issues that are highly relevant to the present study, such as subjectivity, which accompanies sequential voicing. Section 5 then highlights the results and addresses the typological implications of the findings.

2. Framework

This section addresses the framework that will be incorporated in the present study, i.e. distributed morphology. Distributed morphology was initially put forward by Halle and Marantz (1993, 1994), and has been extensively adopted in word formation. It involves three relevant lists: (a) Formative List; (b) Exponent List and (c) Encyclopaedia. A grammatical model of the framework is provided in Figure 2.

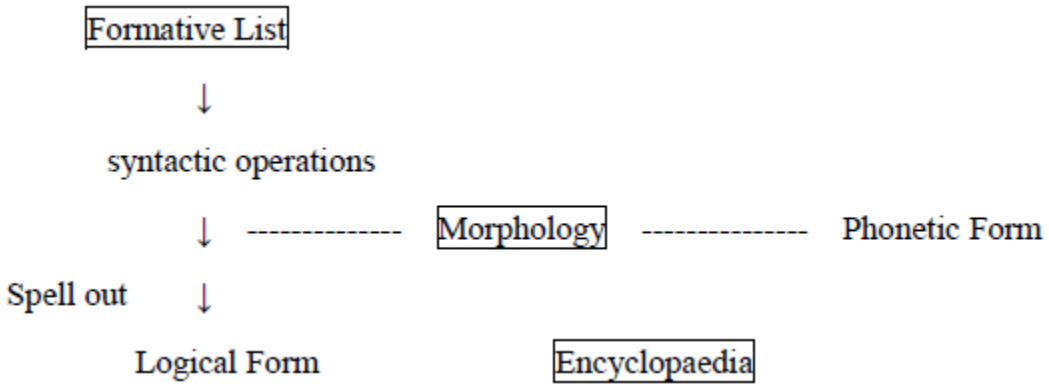


Figure 2. Model of distributed morphology

The central claim of distributed morphology with regard to word formation resides in the significance of syntax. Two ways of forming a lexicon are proposed by Arad (2003) and Embick (2010): root-derived formations and word-derived formations. Root-derived formation refers to a word directly derived from the root, with the original lexicon having little to do with the derived lexicon. In word-derived formation, meanwhile, a word derives from a specified constituent and retains its phonetic and semantic features.

3. Noun-Noun Compounding in Japanese

With the framework highlighted, the following sections will enter into a discussion of Japanese nominal compounding with regard to the questions of (i) the phonological constraint on the formation of noun-noun compounds; (ii) the formation principle from a morphological point of view; (iii) the syntactic headedness in nominal compounds; and (iv) the semantic combinationality, as well as the lexicalisation degree.

3.1 Phonological Issues in Japanese Nominal Compounding: Stress and Sequential Voicing

To begin, we will consider the phonological issues of stress and sequential voicing. Stress plays an important role in Japanese. The sentence *niwatori ga iru*, for example, can be ambiguous. There are two interpretations according to the stress (Note 1) inflection:

(7) **Interpretation I**: when the first noun is stressed, the first lexicon *niwa* becomes a quantifier. The second noun means 'bird', i.e. *niwatori 1* means 'two birds'.

cf. *niwa**1** tori ga iru* 'there are two birds in the yard.'

(8) **Interpretation II**: there is no stress in the compound nouns, thus the first and second lexicon build a compound noun; i.e. *niwatori 0* means 'chicken'.

cf. *niwa tori **0** ga iru* 'there are chickens in the yard.'

In accordance with the theme of the present research, when two or more nouns are combined, generally, the stress transfers to the initial consonant of the final noun. For instance, N_1 is 1 stress, N_2 is 3 stress, N_3 is 1 stress, and the stress of compound N_1 N_2 N_3 would be the first syllable of N_3. An illustration is given in (9).

(9)	***ha**ru* 1,	*yasu**mi***	3,	*haru**ya**sumi*	3	'spring holiday'
	Tokyo 0,	*daigaku*	0,	*Tokyo**dai**gaku*	3	'Tokyo University'

Another salient phonological alternation of noun-noun compounding in Japanese is sequential voicing. Consider the following data.

(10) a. *kaeru* 'frog' → *ama**g**aeru* 'tree frog'

b. *shio* 'salt' → *morijio* 'Japanese tradition: placing salt by the entrance to one's establishment to bring good luck'

c. *tana* (shelf) → *hondana* (book shelf)

d. *ha* 'tooth' → *mushiba* 'dental caries'

As far as (10) is concerned, Japanese sequential voicing presents the following regulation (cf. Kubozono 1999).

a. /k/ →/g/

b. /s/ →/z/, /ɕ/→/(d)ʑ/

c. /t/ →/d/, /tɕ/→/(d)ʑ/, /ts/ →/(d)z/

d. /h/, /ç/, /ɸ/ →/b/

There are four restrictions to sequential voicing.

First, different scripts are impacted by sequential voicing in different ways. Indeed, only *wago* 'kana script' is subject to sequential voicing. Furthermore, sequential voicing is not subject to verb compounds or loanwords. This is illustrated in (11).

(11) a. Wago: *aozora* ‘blue sky’; *tegami* ‘leter’

b. Verb compounds: *nakisakebu* ‘cry-shout’; *mochikaeru* ‘take-go home’

c. loanwords: *norumankonkuesuto* ‘The Norman Conquest of England’

Second, phonetically speaking, when the N_2 contains a voiced consonant, there will be no sequential voicing (cf. Lyman’s Law 1894). This is illustrated in (12).

(12) a. *kago* ‘cage’ → *torikago* ‘bird cage’

b. *soba* ‘buck wheat’ → *yakisoba* ‘fried noodles’

c. *taba* ‘bundle’ → *kagitaba* ‘key bundle’

d. *haba* ‘width’ → *yokohaba* ‘breadth’

Third, from a morpho-syntactic perspective, when two nouns are assigned to a coordinate relation, sequential voicing is prevented. This is illustrated in (13).

(13) a. *oya* ‘parent’ + *o* ‘child’ → *oyako* ‘parent-child’

b. *aka* ‘red’+ *shio* ‘white’ → *akashiro* ‘red-white’

c. *suki* ‘like’ + *kirai* ‘dislike’→ *sukikirai* ‘like-dislike’

The reason for sequential voicing not taking place in the dvandva structure of noun-noun compound may be related to combinationality; in essence, the higher the combination, the more likely it is that sequential voicing will occur.

Finally, the compounding pattern ‘object + transitive verb.$_{\text{conjuctive}}$’ does not receive sequential voicing, as exemplified by (14).

(14) a. *jikan* ‘time’ + *tsubushi* ‘smash’ → *jikantsubushi* ‘time-killing’

b. *meshi* ‘rice’ + *taki* ‘cook’ → *meshitaki* ‘rice-cooking’

3.2 Morphosyntactic Issue: Headedness

Drawing on the restrictions of sequential voicing highlighted above, this section moves on to consider the nominal compound formation process and combinationality on the basis of ‘distributed morphology’.

This study collected 386 data entries from the corpus ‘The Japanese Lexicon: A Rendaku Encyclopedia’ by the National Institute for Japanese Language and Linguistics. To start, 272 tokens were attributed to compounds of sequential voicing and 114 tokens to compounds without sequential voicing. The following section provides a closer examination of the data.

Table 1. Data of Japanese nominal compounds

Consonant of N_2	Tokens of sequential voicing	Tokens of non-sequential voicing
/k/	98	44
/s/	18	15
/t/	37	29
/h/	55	5
/f/	3	7
/c/	59	13
/s/	2	1

This data shows that, when the N_2 is rendered by aspirate consonants /k/ and /t/, it is likely to receive sequential voicing. The N_2 consonant with the second largest number was /c/. Crucially /c/ seldom receives sequential voicing (only 13 tokens are detected) and, neither does the fricative consonant /h/.

Furthermore, the semantic relation between the N_1 and N_2 is observed to have seven variations:

(15) a. Object + Tran.$_{CONJ.}$

b. Instrument + Tran.$_{CONJ.}$

c. Modifier - Tran.$_{CONJ.}$

d. Place - Tran.$_{CONJ.}$

e. Method - Tran.$_{CONJ.}$

f. Cause - Tran.$_{CONJ.}$

g. Subject – Tran. $_{CONJ.}$

The frequency of the variation, as well as illustrations, can be seen below.

Table 2. Semantic relation between N_1 and N_2

Relation between N_1 and N_2	Tokens	Illustrations
Object - Tran.$_{CONJ.}$	86	ご飯作り‘rice-cooking’
Instrument - Tran.$_{CONJ.}$	4	手作り‘hand-made’
Modifier (time, state) - Tran.$_{CONJ.}$	79	後払い‘deferred payment’
Place - Tran.$_{CONJ.}$	14	磯釣り‘surf fishing’
Method - Tran.$_{CONJ.}$	21	音引き‘looking up by on reading’
Cause - Tran.$_{CONJ.}$	1	忌引き‘absence due to mourning’
Subject – Tran. $_{CONJ.}$	1	海開き‘beach opening’; 鸚鵡返し‘parroting’

As suggested in Table 2, the most frequent relation of N_1 and N_2 in terms of Noun-Noun combination is [Object - Tran.$_{CONJ.}$] (86 tokens). The second largest number of tokens was attributed to [Modifier - Tran.$_{CONJ.}$] (79 tokens). [Method - Tran.$_{CONJ.}$] had the third largest applicability (21 tokens). 14 tokens applied to [Place - Tran.$_{CONJ.}$]. Moreover, we noted the following additional results: [Instrument + Tran.$_{CONJ.}$] (4 tokens); [Cause - Tran.$_{CONJ.}$] (1 token) and [Subject – Tran.$_{CONJ.}$] (1 token).

3.3 Morphosyntactic Analysis of Japanese Nominal Compounding

Having examined this data, we are now in a better position to engage with an analysis of Japanese nominal patterning.

3.3.1 [N_{OBJECT} - $N_{TRAN.conj.}$] Nominal Compounds

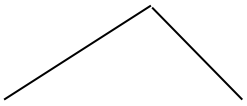
As suggested by Table 1, a common relation of N_1 and N_2 in noun-noun compounding is 'object + transitive verb' (cf. 86 tokens). Essentially, this compounding pattern is not subject to sequential voicing. (16) provides illustrations of [N_{OBJECT} - $N_{TRAN.conj.}$] compounds.

(16) **[N_{OBJECT} - $N_{TRAN.conj.}$] compounds**

a. *gohan-tsukuri* 'rice-cooking'; b. *kane-kashi* 'money lending'

The formation process can be described as follows.

(17) N_{OBJECT} -$N_{TRAN.conj.}$



√$ROOT_1$ N [+√$ROOT_2$ $_{TRAN.conj.}$]

gohan *dukuri*

N_2 *dukuri* is the conjunctive form of transitive verb *tsukuru* 'to make'. The N_1 performs as the object of the transitive verb *tsukuru* and the N_2 establishes the semantic interpretation. The N_2 is syntactically the head.

Crucially, √Root and the latter added morphemes are not semantically associated, as can be confirmed by the fact that [N_{OBJECT} - $N_{TRAN.conj.}$] N-N compounds are highly productive: N_1 may form other nominal compounds with other transitive verbs in the conjunctive form, e.g. *gohan-uri* 'rice selling'; *gohan-taki* 'rice cook'; *gohan-kui* 'rice eating', etc. Incorporating this, it seems proper to contend that it is after the merger that the semantic interpretation is established. Moreover, syntactically, the V-V's category is determined by the added morpheme, i.e. N_2. This formation process is thus a manipulation of 'word derivation'.

3.3.2 [$N_{INSTRUMENT}$ - $N_{TRAN.conj.}$], [$N_{MODIFIER}$ - $N_{TRAN.conj.}$], [N_{PLACE} - $N_{TRAN.conj.}$], [N_{METHOD} - $N_{TRAN.conj.}$] and [N_{CAUSE} - $N_{TRAN.conj.}$] Compounds

In [$N_{INSTRUMENT}$ - $N_{TRAN.conj.}$], [$N_{MODIFIER}$ - $N_{TRAN.conj.}$], [N_{PLACE} - $N_{TRAN.conj.}$], [N_{METHOD} - $N_{TRAN.conj.}$] and [N_{CAUSE} - $N_{TRAN.conj.}$]-formed compounds, the N_1 and N_2 are assigned to a [N_1modifier +

N] relation. $N_{modifier}$ includes instrument, place, method and cause. A salient property of these formations is the fact that sequential voicing happens to N_2. This is illustrated in (18).

(18) a. [$N_{INSTRUMENT}$ - $N_{TRAN.conj.}$] compounds

e.g. *te-gaki* 'hand writing'; *te-fuki* 'hand towel'

b. [$N_{MODIFIER}$ - $N_{TRAN.conj.}$] compounds

e.g. *shoodoogai* 'buying on impulse'; *ato-barai* 'paying later'

c. [N_{PLACE} - $N_{TRAN.conj.}$] compounds

e.g. *furo-shiki* 'wrapping cloth'; *ha-gaki* 'postcard'; *hashi-gaki* 'preface'

d. [N_{METHOD} - $N_{TRAN.conj.}$] compounds

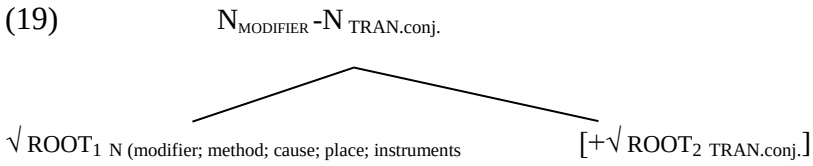
e.g. *e-toki* 'explaining with a pictures'

e. [N_{CAUSE} - $N_{TRAN.conj.}$] compounds

e.g. *ki-biki* 'absence due to mourning'

It is noteworthy that the first constituent is designated as an adverbial verb, describing the METHOD, INSTRUMENTS, CAUSE, PLACE and MANNER of the action that is conveyed by the second constituent. Certainly, the action is now in the conjunctive form, conveying the noun (N_2). Additionally, the semantic interpretation and category are established after the combination. This suggests 'word derivation' as the formation process. This is described in (19).

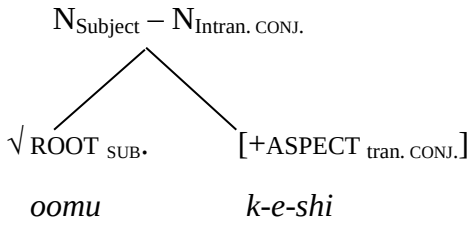
(19)



3.3.3 [$N_{Subject}$ – $N_{tran.\ CONJ.}$] Compounds

It is to [$N_{Subject}$ – $N_{tran.\ CONJ.}$] compounds that we will now turn. Nominal compounds have been further observed being built by subject with a transitive V_{conj}, although only one token was detected: *oomu-gaeshi* 'parroting'. The N_2, *kaeshi*, renders the action (i.e. return/copy.$_{conj}$). The N_1 acts as the agent of the action. It is the latter constituent that specifies the semantic interpretation. Word derivation is thus exhibited.

(20)



Pulling these strands together, we might pin down the semantic compositionality and productivity of Japanese nominal compounds. Japanese noun-noun formation is facilitated at

a syntactic level. √Root and the latter added morphemes are not semantically associated; it is after the merger that the semantic interpretation is established. The formation is highly productive, and most meanings are lexicalised. Syntactically, the N-N's category is determined by the added morphemes. This contributes to the contention that the formation process of Japanese nominal compounds is a manipulation of 'word derivation'.

3.4 Lexicalisation

The previous section mapped out an overall picture of Japanese nominal compounding, displaying that there are seven variations in the semantic relations between the N_1 and N_2, and that Japanese nominal compounding is facilitated by the process of 'word derivation'. An important observation that was briefly alluded to earlier, but which it is necessary to come back to at this point, is that of lexicalisation.

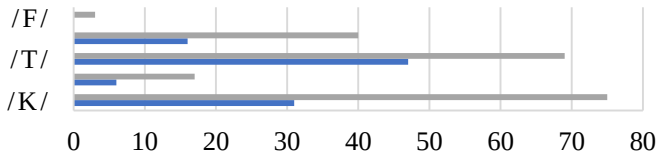
Lexicalisation is a phenomenon where the word retains the original meaning from a semantic perspective, but no longer bears the initial function syntactically, e.g. 腰掛け *koshikake* 'chair'. Essentially, lexicalisation in nominal compounding seems to be limited to [N_{OBJECT} - $N_{TRAN.conj.}$] compounds. As such, the following are excluded:

(a). [X-着] compounds, e.g.上着 'outer garment'; 割烹着 'apron'; 夏着 'summer kimono', etc).

(b). [X-漬け] compounds, e.g. 一夜漬け *ichiyaduke* 'pickles made overnight'; 糟漬け *kasuduke* 'pickling in sakélees'.

(c). [N_{METHOD} - $N_{TRAN.conj.}$] compounds like *tefuki* 'hand towel'; [$N_{MODIFIER}$ - $N_{TRAN.conj.}$] compounds like *maegashi* 'lending as an advance'; and [N_{PLACE} - $N_{TRAN.conj.}$] compounds like *isozuri* 'rocky shore fishing' are not tackled.

With this in place, this study will now move on to calculate the lexicalisation distribution of the data. Since all nominal compounds in Japanese are right-headed, out investigation divides compounds according to the N_2 beginning with consonants /K/, /S/, /T/, /H/ and /F/. The findings are summarised in Figure 3.



	/k/	/s/	/t/	/h/	/f/
Tokens of non-lexicalisation	75	17	69	40	3
Tokens of partially or fully lexicalisation	31	6	47	16	0

The data shows that the most frequent option in terms of lexicalisation is found in compounds where the N_2 begins with a T consonant (47 tokens). The largest number of tokens about non-lexicalisation was attributed to compounds where the N_2 begins with a K consonant (75

tokens). 40 tokens applied to non-lexicalisation of compounds where the N_2 begins with a T consonant. To further this discussion, the following data presents illustrations of lexicalisation on the [N_{OBJECT} - $N_{TRAN.conj.}$] type:

Table 3. Illustration of lexicalisation

KANJI-KANA	Romanisation	English	Relation of N1 and N2	Lexicalisation
紙切り	*kami + kiri*	paper cutting	Obj - Tran.conj.	not lexicalised
皮切り	*kawa+kiri*	beginning	Obj - Tran.conj.	lexicalised
裏切り	*ura+giri*	betrayal	Obj - Tran.conj.	lexicalised
車引き	*kuruma+hiki*	cart puller	Obj - Tran.conj.	not lexicalised
籤引き	*kuji-biki*	drawing lots	Obj - Tran.conj.	not lexicalised
字引き	*ji+biki*	dictionary	Obj - Tran.conj.	?lexicalised
税引き	*zei+biki*	boasting	Obj - Tran.conj.	lexicalised
福引き	*fuku+biki*	raffle	Obj - Tran.conj.	lexicalised
面食い	*men-kui*	liker of the good-looking	Obj - Tran.conj.	lexicalised

As shown in Table 3, N_2 *kiru* has two functions: (a) a substantive noun, and (b) a lexicalised noun. In *kurumahiki* ‘cart puller’ and *kujibiki* ‘drawing lots’, N_2 *kiru* behaves as a substantive noun, meaning ‘to pull’. *Jibiki* ‘dictionary’; *nidukuri* ‘packing’; *zeibiki* ‘boasting’ and *fukubiki* ‘raffle’ are often alleged as ONE WORD. We assume that this is an outcome of lexicalisation. The nominal formation of [object + hiki] is highly lexicalised. Apart from the [N_1+hiki] compound, many other transitive verb-derived nouns can also build nominal compounds via lexicalisation. For instance, 越し *koshi* in 頭越し *atamakoshi* ‘going over another’s head’ displays a substantive use while in 年越し *toshikoshi* ‘passing to the new year’ demonstrates a use of lexicalisation. 書き *kaki* ‘writing’ in 使用書き *shiyoogaki* ‘specifications’ and 効能書き *koonoogaki* ‘statement of drug effects’ functions as a substantive noun, while in 人相書き *ninsoogaki* ‘likeness’ and 葉書 *hagaki* ‘postcards’ are lexicalised. The meaning of 遣い in 仮名遣い *kanazukai* ‘kana usage’ is substantive use, while in 心遣い *kokorozukai* ‘consideration’ is lexicalised. Further examples include 憂さ晴らし *usa barashi* ‘forgetting one’s cares’; 暑気払い *shokibarai* ‘overcoming summer heat’.

4. Summary

This study has delved into Japanese nominal compounding via a phonological, morphological and semantic interface. The findings can be summarised as follows.

(I) From a script point of view, only *wago* ‘kana script’ is subject to sequential voicing. Sequential voicing is not subject to verb compounds or loanwords.

(II) Phonologically, when two or more nouns are combined, generally the stress is always placed on the initial consonant of the final noun.

(III) When the N_2 contains a voiced consonant, there will be no sequential voicing. Moreover, when two nouns are assigned via a coordinate relation, sequential voicing

is prevented. The reason for sequential voicing not taking place in the dvandva structure of noun-noun compounding may have something to do with the combinationality; in essence, the higher the combination, the more likely it is that sequential voicing occurs. Perhaps it would not be unsound to mention that, in Italian compound nouns, the inflection of plural has two choices: either inflected in the N_1, or in the N_2. Italian compound noun inflection depends on the degree of combinationality, which leads to the degree of lexicalisation. If the plural can be inserted in the N_1, its combinationality is not tight and it is therefore not highly lexicalised item.

(IV) During the process of forming a nominal compound, when the second constituents (N_2) are rendered by aspirate consonants /k/ and /t/, the N_2 are very likely to receive sequential voicing. When the N_2 are conveyed by consonant /c/ and fricative consonant /h/, sequential voicing does not occur.

(V) Semantically, the relation between N_1 and N_2 falls into seven variations:

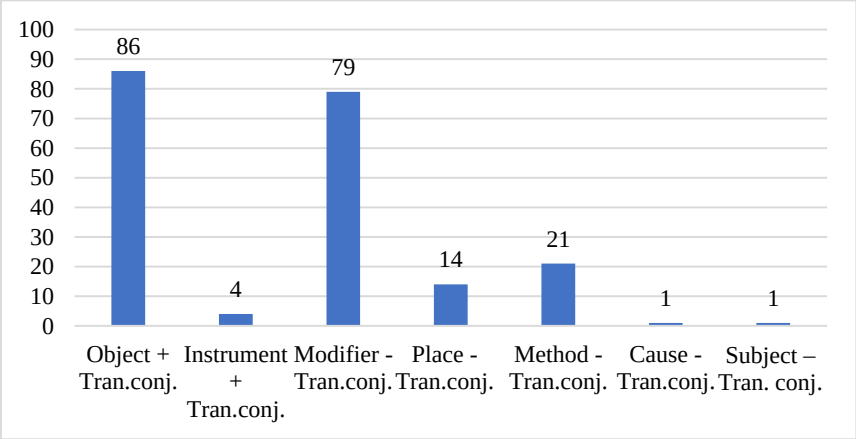


Figure 4. Semantic relation of N1 and N2

Among these variations, sequential voicing is only subject to [N_{OBJECT} - $N_{TRAN.conj.}$] and [$N_{SUBJECT}$ - $N_{TRAN.conj.}$] nominal compounds. Moreover, given the fact that, (i) √Root and the latter added morphemes are not semantically associated, and it is after the merger that the semantic interpretation is established; (ii) syntactically, the N-N's category is determined by the added morphemes; and (iii) the formation is highly productive and most meanings are lexicalised, we cannot but contend that the formation process of all Japanese nominal compounds is realised via 'word derivation' manipulation. In addition, we noticed lexicalisation is involved in [N_{OBJECT} - $N_{TRAN.conj.}$] type of compounding.

References

Aikhenvald, A. (2007). Typological distinctions in word-formation. In Shopen, T. (Ed.), *Language Typology and Syntactic Description. Volume III: Grammatical Categories and the Lexicon* (2007, 2nd ed., pp. 1-65,). Cambridge: Cambridge University Press.

Arad, M. (2003). Locality constraints on the interpretation of roots. *Natural Language and Linguistic Theory, 21*, 736-778.

Booij, G. (2010). Compound construction: Schemas or analogy? A construction morphology perspective. In Scalise, S., & Vogel, I. (Eds.), *Cross-Disciplinary Issues in Compounding* (2010, pp. 93-107). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Embick, D. (2010). *Localism versus Globalism in Morphology in Morphology and Phonology*. MIT Press.

Halle, M., & Alec, M. (1993). Distributed Morphology and the Pieces of Inflection. *The View from Building 20*. Cambridge, MA: MIT Press, pp. 111-176.

Halle, M., & Alec, M. (1994). Some key features of Distributed Morphology. *Papers on Phonology and Morphology, MITWPL 21*. Cambridge, MA: MIT Working Papers in Linguistics, pp. 275-288.

Jackendoff, R. S. (2009). Compounding in the parallel architecture and conceptual semantics. In R. Lieber, & P. Štekauer (Eds.), *Handbook of compounding* (pp. 105-128). Oxford: Oxford University Press.

Jackendoff, R. S. (2010). *Meaning and the Lexicon: The Parallel Architecture 1975–2010.* New York: Oxford University Press.

Kageyama, T. (1993). *Bunpou to gokeisei* [Grammar and word formation]. Hitsuji Syobo Publishing.

Laurie, B. (2009). IE, Germanic: Danish. In R. Lieber, & P. Stekauer (Eds.), *The Oxford Hand- book of Compounding* (pp. 400-416). Oxford Uni- versity Press, Oxford, UK.

Li, W. (2018). Grammaticalisation and lexicalisation of the Chinese verb duàn. *Acta Linguistica Asiatica*, *8*(2), 111-137.

Lieber, R., & Stekauer, P. (2009). *The Oxford Handbook of Compounding*. Oxford Handbooks in Linguistics. OUP Oxford.

Scalise, S., & Vogel, I. (2010). Why Compounding?. In S. Scalise, & I. Vogel, (Eds.), *Cross-Disciplinary Issues in Compounding* (2010, pp. 1-18.). Amsterdam /Philadelphia: John Benjamins.

Note

Note 1. The ‘stress’ is marked in bold and numbers.

Copyrights