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Not peer-reviewed version

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Posted Date: 22 December 2023

doi: 10.20944/preprints202312.1694.v1

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*Article*

# NN and VV Coordinate Compounds

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**Abstract:** Broadly speaking, binominal and biverbal lexical constructions have been studied independently in different research traditions and frameworks. It is true that the two do not necessarily have overlapping areal distributions, but the fundamental question remains whether Indo-European NN compounds and Transeurasian VV compounds have nothing in common. From a purely theoretical perspective also, the cross-categorial parallelism is worthy of serious investigation because a theory of the process of compounding that inherits the spirit of X-bar theory strives to capture commonalities among various compounding patterns and category-specific constraints observed within and across languages. Against this background, a cross-categorial comparison, not within but across languages, is made of coordinative binominal and biverbal constructions. NN and VV coordinate compounds from English and Japanese are examined in detail using the methodology of contrastive morphology and decompositional lexical semantics. It is shown that dvandva is possible not only in NN but also in VV coordinate compounds and furthermore that the dvandva-appositive distinction in NN coordinate compounds recurs in VV coordinate compounds.

**Keywords:** compounding; coordination; dvandva; appositive; headedness; noun-verb parallelism; number; aspect; feature

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## 1. Introduction

Compounding is one of the central topics in the study of word-formation. Generally, compounds are classified according to the syntactic category or word class of their components and the entire construction, the internal syntax and semantics and headedness of the entire construction, and the formal makeup of their components. In Scalise and Bisetto (2009), the three fundamental grammatical relationships, subordination or head-complement relationship, modification, and coordination constitute a parameter of their classification of Germanic and Romance compound nouns:

(1) a. Subordination: e.g., *taxi driver, brain death*
b. Modification: e.g., *ghostwriter, blackboard*
c. Coordination: e.g., *singer-songwriter, mind-brain*

COORDINATE COMPOUNDING, the topic of this paper, is the case of compounding in which same-category lexemes are asyndetically coordinated and morphologically realized in an identical form type. In the following English examples (cited from Bauer 2008, Scalise and Bisetto 2009), two nouns occur in a relationship that is connected by the conjunction *and* in the uncompounded condition (see the translations):

(2) a. *singer-songwriter*
'someone who is a singer and songwriter'
b. *actor-author*
'someone who is an actor and author'

(3) a. *mind-brain*
'the philosophical and physiological aspects of cognitive processes

considered as a causally interrelated entity' <Philosophy>

b. *Austro-Hungary, Austria-Hungary*

'the dual monarchy established in 1867 by the Austrian emperor Franz Josef, according to which Austria and Hungary became autonomous states under a common sovereign.'

The division between (2) and (3) has been a topic of considerable interest in recent decades. Thanks to the concerted efforts of morphologists and typologists (ten Hacken 1994, Olsen 2001, Wälchli 2005, Bauer 2008, 2010a, 2017, Renner 2008, Arcodia et al. 2010, Ralli 2013, 2019, Shimada 2013), it is now widely accepted that the internal syntax and semantics of coordinate compounds is not monolithic. Specifiacally, (2) represents APPOSITIVE coordination, which coordinates semi-permanent states of a single individual, whereas (3) represents DVANDVAS, a type of coordinate compound that typically describes a whole composed of the parts named by their components. While English uses the same conjunctive coordinator regardless of the type of conjunctive semantics (Hoeksema 1988), Japanese uses different conjunctions, *de* 'and' for apposition and *to* 'and' for set formation or collectivization. Thus, the phrasal translations of the compounds in (2, 3), if given in Japanese, will contain *de* and *to*, respectively, as in (2a) *singer-songwriter* = '*singaa de songuraitaa*' vs. (3b) *Austria-Hungary* = '*oosutoria to hangarii*.'

The headedness of these constructions is another matter of ongoing scholarly debate (the references cited above; also, Scalise et al. 2009, Bauer 2010b, 2022, Bagasheva 2015, Pepper 2016, Nóbrega and Panagiotidis 2020, among others). The authors of Scalise and Bisetto (2009) are of the opinion that the appositive-dvandva division of NN coordinate compounds results from their second compounding parameter defined by headedness. In it, appositives are endocentric in the sense that one component is structurally dependent on the other, while dvandvas are exocentric in the sense that the combined components carry equal weight and neither of them is more prominent. The Sanskrit grammar also treats appositive compounds as a type of endocentric compound called karmadhārayas, not as dvandvas. Usually, compounding produces a subcategory of the referent of the head component; thus, ten Hacken (1994: 74) defines H(EADED)-COMPOUNDING as the construction of the structure [XY]Z or [YX]Z and of the following semantics: "the denotation of Z is a subset of the denotation of Y." Significantly, appositive coordinate compounds are no exception to this definition. Thus, just as *ghostwriter* denotes a type of writer, *singer-songwriter* is a type of songwriter; the difference being that while someone called a *ghostwriter* is never a type of ghost, the latter allows such an alternative reading, i.e., *singer-songwriter* as denoting a type of singer. This suggests that appositive coordinate compounds and modificational compounds form a continuum.[1] In contrast, dvandva coordinate compounds typically name a superordinate concept or superset that includes the referents of their components as smaller subsets. As a result, the same test shows that this type is exocentric: e.g., (3a) *mind-brain* is neither a type of mind nor a type of brain. The notion of double-headedness is avoided because it unnecessarily complicates the discussion. For example, Ceccagno and Basciano (2009) and Niinuma (2015) say that dvandvas are double-headed, while Naya and Ishida (2021) apply the concept to appositive compounds.

The formal aspect of coordinate compounding has not received much attention in the literature to date, except for the occasional observation that dvandva coordinates can have identical inflections (Wälchli 2005, Kiparsky 2010). In English, form sameness in set formation coordination is observed in binomials (Kopaczyk and Sauer 2017); in this multi-word expression containing an overt conjunctive or disjunctive coordinator, the *-ing* form should coordinate with another *-ing* form, while an unmarked or citation form should coordinate with another unmarked or citation form: e.g., *coming and going*, *come and go*, **coming and go*. Similarly, while *going up and down* and *ascending and descending* are each observed, their mixed usage is not. English appositive coordinate compounds often, though not always, involve components of an identical form, such as the two agentive nominalizations in (1a, b).

The purpose of this article is to introduce VV coordinate compounds into the NN-centered research landscape and to argue that they also divide along the appositive-dvandva distinction. VV

[1] In Scalise and Bisetto's (2009) model, the modificational class is called "attributive-appositive," where "appositives" are separate from the type in (2) and refer to compounds such as *snailmail*, *swordfish*, and *mushroom cloud*. While we do not endorse this usage, the confusion itself testifies the existence of the said continuum.

coordinate compounds have received much less attention than NN or AA coordinate compounds, but as will be argued in this paper, they too contain dvandvas and appositive-like non-dvandvas. This proposition should not be confused with the broader perspective that VV compounds can be divided into the subordinate, modificaitonal, and coordinate types, along the same lines as observed among NN compounds in (1a-c). For example, Nicholas and Joseph (2009) and Kiparsky (2009) argue for the SUB vs. COORD distinction among Modern Greek VV compounds. Ceccagno and Basciano (2009: 480-482, 486) suggest that the verb + object type, the resultative type, and the serial-verb type of Mandarin Chinese compound verbs belong to the SUB type, while "two-headed" coordinate compounds include instantiations of the structure [V+V] v. In contrast to these previous studies, this article is concerned with the more delicate question of WHETHER DVANDVAS ARE POSSIBLE IN VV COORDINATE COMPOUNDING.

Since this is an empirical question, the methodology employed is a combination of descriptive and contrastive morphology, using basic morphological and conceptual semantic terms as defined in Bauer et al. (2013: Ch.2) and Cruse (2011), respectively. More specialized or language-specific terms will be defined as they are introduced. As a first hurdle, VV compounds are not very good subjects of the *"Z is a type of X/Y"* headedness test; a conceptual system that is independent of syntactic category is required. To this end, we take advantage of a feature-based morphological theory that is introduced in Lieber (2004) and is now called LSF (Lexical Semantic Framework) in subsequent publications (Lieber 2016a). The data source is authoritative dictionaries and linguistic publications (books or journals); in some parts, sentences produced by introspection are necessary, but they are all double-checked by other native speakers.

The discussion proceeds as follows: in the next section, classic dvandvas are defined semasiologically and onomasiologically, and a prediction regarding VV compounding is advanced. In section 3, data materials are generated and two patterns are drawn from VV coordinate compounds using the same descriptive parameters as used in this section. Section 4 puts the prediction to test using the data and shows that dvandvas are possible in VV coordinate compounding. Without stopping here, the discussion goes on to observe that the non-dvandva VV compounds behave like appositive NN compounds, and propose an entirely novel hypothesis that the dvandva-appositive distinction is possible among VV coordinate compounds.[2] Section 5 concludes the discussion. In short, the goal of this paper is to find a bridge between NN and VV compounds in one of the fundamental types of compounds. While its empirical scope is limited, it is written with the broader goal of contributing to emerging research projects encompassing binominal and biverbal lexical constructions (Lieber and Štekauer 2009, Bagasheva 2015, Bauer 2017).

## 2. Framework

### *2.1. Dvandva from a semasiological perspective*

In Bauer (2008) and Arcodia et al. (2010), dvandvas are defined as a type of coordinate compounds in which the components are parts/hyponyms, and the entire construction is the whole/hypernym. In Bauer's (2008) classification, the first type of dvandva is called ADDITIVE and refers to the collective set of members that are co-meronyms or converses. Converses are a subtype of opposites.[3] Most English dvandvas, including those in (3), belong to this type. Given below are Japanese additive dvandvas cited from Yonekura et al. (2023: Ch.2). Hyphen-connected examples consist of freely occurring morphs, while the unconventional use of the word-internal equal sign captures those connecting bound morphs.

(4) a. *oya-ko* Additive

[2] Pace the following suggestion: "It should be clear though that the distinction in coordinative [= dvandva or co-compound] and appositive compounds applies only to [NN] compounds. For [AA] and [VV] formations, this distinction is meaningless since their semantics do not imply a referent." (Ralli 2013: 161)

[3] OPPOSITES refer to pairs of semantically incompatible binary words and divide into four main subtypes: COMPLEMENTARIES (such as *dead : alive, true : false, male : female*), ANTONYMS (such as *long : short, hot : cold, good : bad*), REVERSIVES (such as *up : down, rise : fall, advance : retreat*), and CONVERSES (such as *above : below, lend : borrow, husband : wife*) (Cruse 2011: 153-161).

 doi:10.20944/preprints202312.1694.v1



parent child
'parent and child'

b. *te-asi*
hand foot
'hands and feet, the limbs'

c. *me-hana*
eye nose
'eyes and nose'

d. *dan=zyo*
man woman
'man and woman'

e. *huu=hu*
husband wife
'man and wife'

f. *zi=moku*
ear eye
'eyes and ears; one's attention or notice'

As subtypes of the semantic relationship between binary opposites, Cruse (2011) divides complementary, antonymic, reverse, and converse relationships (see footnote 3). Complementary or antonymic opposites produce the second type of dvandva called EXOCENTRIC. For example, the Japanese dvandvas in (5a, c) combine pairs of complementary opposites, while those in (5b, d) consist of antonymic opposites:

(5) a. *zen-aku* Exocentric
virtue vice
'virtue and vice, good and evil'

b. *yosi-asi*
good bad
'good and/or bad, right and/or wrong, merits and demerits'

c. *ze=hi*
right wrong
'right and/or wrong, pluses and minuses, pros and cons'

d. *sin=kyuu*
new old
'the old and the new, old or new'

It is a bit odd to have an "exocentric" type within a class whose defining characteristic is exocentricity, but in our understanding the term captures the fact that this type is characterized a fundamental mismatch between the input semantic type—gradable or non-gradable property—and the output syntactic category, which is always noun. By the very semantic nature of the connected lexemes, exocentric dvandvas may express disjunctive coordination in addition to conjunctive coordination. Moreover, this type has a third reading that refers to the underlying scale itself, as observed by Scalise et al. (2009) and Shimada (2013).

The third and fourth types of dvandvas are called CO-HYPONYMIC and CO-SYNONYMIC, respectively. The following Japanese examples suggest that dvandva coordination can function to neutralize the boundary between subtypes named by co-hyponyms or co-synonyms, and synthesize them into a single new type:

(6) a. *kusa-ki* Co-hyponymic
grass tree
'plants, vegetation'

b. *gyo=kai*
fish shellfish
'fish and shellfish'

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c. *tyoo=zyuu*
bird beast
'birds and animals, wildlife'

(7) a. *sugata-katati* Co-synonymic
figure shape
'outward appearance'
b. *kai=ga*
picture=picture
'a picture; pictorial arts'

In (6a), *kusa-ki* can literally refer to grasses and trees but is more commonly used to refer indiscriminately to everyday plants. In (7a), *sugata* and *katati* are synonyms expressing 'outer form,' with the former being used for the outer form of someone and the latter for the external form of something. However, this boundary is neutralized in the dvandva, so *sugata-katati* does not discriminate the animacy of the possessor.

In summary, classic dvandvas are exocentric compounds that asyndetically combine co-meronyms, converse/complementary/antonymic opposites, co-hyponyms, or co-synonyms. Their morphophonological aspect, on the other hand, may differ from language to language. In the case of Japanese NN dvandvas, two observations are worth noting. First, they retain the accent nucleus of the left component, as in (4) *oya'ko, te'asi,* (5) *zen'aku, yosi'asi,* (6) *kusa'ki,* (7) *sugata'katati.* This is said to deviate from a more dominant accent pattern of Japanese compounding where the right component acts as the determiner (Tsujimura 2014: 86-96). A good example of the latter would be: *a'kusento* 'accent' + *ki'soku* 'rule' → *akusentoki'soku* 'accent rule.'

Second, throughout the data in (4-7), dvandva components appear in either the [free morph + free morph] or [bound morph + bound morph] pattern; mixed realizations are not observed. This generalization made by Shimada (2013) raises the question of which pattern is more fundamental. The answer seems to be the bound + bound pattern, since many contemporary free + free examples have corresponding bound + bound realizations used in earlier times. For example, (4b) transcribes the so-called *kun*-reading "Japanese reading" of the word written 手足, but this word used to be read as *syu=soku*, in the *on*-reading "Chinese reading." The same observation applies to the example in (4c). Its Kanji representation 目鼻 was previously read as *ji=moku*. Significantly, the *kun* and *on*-readings of a kanji character are bound morphic and free morphic realizations of the lexeme represented by that kanji (Nagano and Shimada 2014). Presumably, the morphophonological alternation of kanji characters contributed to the gradual emergence of the free + free pattern from the bound + bound pattern. The proposed diachronic relationship between the two realization patterns is also consistent with the emergence of minor exceptions to the rule of the same-morph type realization.[4]

*2.2. Dvandva from an onomasiological perspective*

Dvandva compounds typically name a higher-level concept or superset that includes the referents of its components as smaller subsets. Thus, from an onomasiological perspective, classic dvandvas belong to the catalogue of constructions that have been gathered under the umbrella of lexical plurals (Acquaviva 2008, Lauwer and Lammert 2016, Gardelle 2019).

For example, additive dvandvas are similar to group nouns such as *committee*, *family*, *herd*, *nation*, etc., and bipartite nouns such as (Huddleston and Pullum 2002: 340-342):

(8) a. *a pair of {shoes/socks/earrings/gloves...}* cf. a shoe
b. *a pair of {glasses/scissors/trousers...}* cf. *a glass

[4] For instance, *gyo=kai* 'fish and shellfish' (6b) is such an exception when written as 魚貝 but not when written as 魚介. According to an authoritative dictionary, the mixed reading emerged as a reanalysis of the original [bound (魚 *gyo*) + bound (介 *kai*)] structure.

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They all name spatially bounded units that are composed of separable similar internal units. In the LSF (Lexical Semantic Framework), where lexical semantics is described as bundles of features (Chomsky 1965), such nouns share the QUANTITY-related semantic features [+B(ounded), +CI (composed of individuals)] defined as follows (Lieber 2004: 136):

- [B]: This feature stands for "Bounded." It signals the relevance of intrinsic spatial or temporal boundaries in a SITUATION or SUBSTANCE/THING/ESSENCE. If the feature [B] is absent, the item may be ontologically bounded or not, but its boundaries are conceptually and/or linguistically irrelevant. If the item bears the feature [+B], it is limited spatially or temporally. If it is [−B], it is without intrinsic limits in time or space.
- [CI]: This feature stands for "Composed of Individuals." The feature [CI] signals the relevance of spatial or temporal units implied in the meaning of a lexical item. If an item is [+CI], it is conceived of as being composed of separable similar internal units. If an item is [−CI], then it denotes something which is spatially or temporally homogeneous or internally undifferentiated.

At the most basic level, lexemic concepts are affiliated into the macro-category SITUATION (a shorthand for EVENT/STATE) or SUBSTANCE/THING/ESSENCE. They are then decomposed into two-stratum bundles of features: BODY, encyclopedic information, and SKELETON, which is not just a bundle but rather a hierarchical structure headed by grammatically relevant semantic features such as [material], [dynamic], [Loc] (Location), [IEPS] (Inferable Eventual Position or State), [Scalar], [Animate], [B], and [CI].

First, the co-occurrence with the collective classifier *kumi* 'group,' shown below, shows that additive dvandvas refer to spatially bounded objects; that is, they carry the [+B] feature.

(9) a. *hitokumi no oya-ko*
one-group gen parent-child
'parents and children as one group'
b. *hutakumi no oya-ko*
two-group gen parent-child
'two groups of parents and children'
c. *hyakkumi no oya-ko*
one-hundred-group gen parent-child
'100 groups of parents and children'

That the compounds in (4) also have the feature [+CI] can be shown by various tests. For example, compound verbs headed by *aw-* 'meet' require a plural subject (Yumoto 2005: 201), as shown by the following minimal pair (*atta* is the final realization of the combination of *aw-* and the past-tense suffix *-ta*):

(10) a. *Taroo to Hanako ga {hure-atta/warai-atta}.*
and nom touch-meet.pst/smile-meet.pst
'Taro and Hanako {touched each other/smiled at each other}.'
b. **Taroo ga {hure-atta/warai-atta}.*
nom touch-meet.pst smile-meet.pst

As shown below, the syndetic coordinative phrase in (10a) can be replaced by an additive dvandva compound.

(11) a. *Hitokumi no oya=ko ga {hure-atta/warai-atta}.*
one-group gen parent-child nom touch-meet.pst smile-meet.pst
'A parent and her child {touched each other/smiled at each other}.'
b. *Hanako no te-asi ga hure-atta.*
gen hand-foot nom touch-meet.pst
'Hanako's hand and foot touched each other.'

In (11), a singular number or possessive phrase is added to the dvandva subject to ensure that there is only one collective set.

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Next, while the non-additive types do not naturally co-occur with a collective classifier such as *kumi* 'group,' it is certain that they are conceived as composed of separable similar internal units. This suggests that non-additive dvandvas are like lexically plural nouns such as *cattle* and *sheep*, which have the [−B, +CI] features.

Studies on number-marking languages report that countable dvandvas exhibit lexical plural marking, as illustrated below by (12) Sanskrit examples from Whitney (1879: 485), (13) Modern Greek examples from Ralli (2019: 7), and (14) Mordvin examples from Wälchli (2005: 137, 139).

(12) a. *hastyaśva**u*** Sanskrit
elephant (*hastin-*)-horse (aśva-).DU
'elephant and horse'
b. *hastyaśvā**ḥ***
elephant-horse. PL
'elephants and horses'

(13) a. *jinek-o-peδ**a*** Modern Greek
woman-CM-child.PL
'women and children'
b. *maxer-o-pirun**a***
knife-CM-fork.PL
'cutlery'
c. *ader-o-sikot**a***
intestine-CM-liver.PL
'intestines and livers'

(14) a. *t'et'a.**t**-ava.**t*** Mordvin
father.PL-mother.PL
'parents'
b. *ponks.**t**-panar.**t***
trousers.PL-short.PL
'clothing, clothes'

The bolded number marking in (12-14) is lexical rather than grammatical because it does not count the number of the referent of the whole construction, as is usually observed in countable endocentric NN compounds. That is, the grammatical number marking of *prayer book**s***, for example, refers to the plurality of prayer books. In contrast, in (12a), the dual suffix does not mean that there are two elephant-horse sets; rather, it counts the number of homogenized set members: an elephant as one such member + a horse as another such member = two members. Similarly, in (14a), where multiple exponence (Harris 2017) is observed, the plural suffixes are concerned with the plurality of set members, not sets (dual is already lost at this stage of the language (Corbett 2000: 203)). In English, *Anglo-Saxon* presents a similar case; the following paraphrase of this dvandva by Renner (2008: 609) suggests that the suffix *-s* refers to the summation of Angles and Saxons:

(15) a. *Anglo-Saxons are Angles plus Saxons.*
b. **An Anglo-Saxon is an Angle plus a Sa*xon.

In conclusion, it seems safe to say that the feature [+CI] is the overarching onomasiological characteristics of dvandvas.

What does this conclusion predict in terms of our research question? As elaborated in Lieber (2004: Ch.5), the quantity-related semantic features capture the widely recognized parallelism between nouns and verbs in their quantitative semantic properties, namely, number and lexical aspect. Thus, the parallelism between singular count nouns (e.g., *person, fact*) and non-repetitive punctual verbs (e.g., *explode, name*) is captured by their possession of the featural complex [+B, −CI]. Mass nouns (e.g., *furniture, water*) and nonrepetitive durative verbs (e.g., *descend, walk*) are similar because they share the featural complex [−B, −CI]. The feature [+CI], our focus, underlines group

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nouns (e.g., *committee, heard*), plural nouns (e.g., *cattle, sheep*), and repetitive durative verbs (e.g., *totter, pummel, wiggle*). As summarized in Table 1, group nouns have no verbal counterparts because "[...] for a verb to be intrinsically [+B, +CI] it would have to denote an event that is at the same time instantaneous/punctual and yet made up of replicable individual events, a combination which does not seem possible" (Lieber 2004: 139):

**Table 1.** Application of quantitative features to nouns and verbs (Lieber 2004: 137, 139)

| Semantic features | Examples in N | Examples in V |
|---|---|---|
| [+B, −CI] | *person, fact* | *explode, name* |
| [−B, −CI] | *furniture, water* | *descend, walk* |
| [+B, +CI] | *committee, herd* | <logically impossible> |
| [−B, +CI] | *cattle, sheep* | *totter, pummel, wiggle*[1] |

The next important point is that features can be manipulated by morphology. In English, for example, the semantic contribution of the progressive suffix *-ing* is to add the feature [−B] to the base lexeme, while the plural suffix *-s* contributes the feature complex [−B, +CI]. In derivational morphology, the suffixes *-ery* and *-age* are known to produce collective nouns from singular count nouns, as in *jewelry* from *jewel*, *peasantry* from *peasant*, *mileage* from *mile*, *wreckage* from *wreck*. This observation is explained if the suffixes "add the features [+B, +CI] to their base, indicating that the derived noun is to be construed as a bounded aggregate or collectivity of individuals related to the base noun" (Lieber 2004: 149). The derivational prefix *re-*, on the other hand, adds the feature [+CI] to certain types of verbs to produce repetitive verbs, as in *redescend* from *descend*, *rebuild* from *build*, *rename* from *name*. While Lieber (2004: Ch.5) does not discuss compounding in this context, a similar analysis can be extended to dvandvas; that is, dvandva compounding extrinsically adds the feature [+CI] to the semantic contributions of the component lexemes. For example, the additive dvandva in (4a) would be produced as follows: [*oya*] 'parent' + [*ko*] 'child' → [+CI] [*oya=ko*]. The output compound is exocentric precisely because there is no overt morph matching with the added feature (although the lexical plural markers in (12-15) may be such morphs). See Section 4.2 for more on the process of endocentric and exocentric compounding in the LSF.

If this analysis is on the right track, it is predicted from the category-neutral nature of the quantity-related features (see the definitions above) and the impossibility of [+B, +CI] in the verbal domain (see Table 1) that THERE SHOULD BE VV DVANDVAS THAT BEHAVE AS [−B, +CI] WORDS.

## 3. Data

The above prediction can be tested with data from Japanese, a language that is rich in VV compounds. Traditionally, the term "VV compound" is used restrictively to refer to biverbal compounds that inflect as unambiguous verbs (pattern A), but as will be shown presently, this is not the only pattern in which two native verbs are compounded (pattern B).

### *3.1. Pattern A*

In Pattern A, the dominant approach identifies lexically and syntactically produced types (Kageyama 1993, Matsumoto 1996, Fukushima 2005, Yumoto 2005; see Kageyama 2009 for an overview). In lexical VV compounds, all grammatical relations are attested, as indicated below with examples from Fukushima (2005) and Yumoto (2005: Ch.3). The parenthesized parts of the linguistic materials are present-tense inflectional suffixes.

(16) a. Subordination (Complementation)
*mi-otos(u)*
look fail
'to fail to see, to overlook'

Subordination or modification (resultative)
*tataki-war(u)*
hit break

 doi:10.20944/preprints202312.1694.v1



'to break (something) by hitting it'

b. Modification (manner)
*tobi-okir(u)*
jump get up
'to get up in a jumping motion'

*moti-yor(u)*
have approach
'to crawl towards'

c. Coordination
see (17)

Yumoto's (2005) data on coordination is expanded below, with additional examples from Niinuma (2015) and Yonekura et al. (2023: Ch.4). Pattern A coordination combines co-synonyms or (rarely) a pair of reversive opposites. In our judgments, the first and second examples in (17a) differ only in that the latter is somewhat depreciative and can be used of an inanimate, noisy object.

(17) a. *naki-sakeb(u)* co-synonymic/nonrepetitive durative
cry scream
'to cry and scream'

*naki-wamek(u)*
cry scream
'to cry and scream'

*ukare-sawag(u)*
be.excited be.noisy
'to be noisy'

*hikari-kagayak(u)*
shine shine
'to shine'

*omoi-egak(u)*
think picture
'to imagine'

*nageki-kanasim(u)*
lament be.sad
'to mourn'

*tae-sinob(u)*
bear endure
'to bear'

*koi-sitaw*
long for-adore
'to long for, to miss deeply'

*imi-kiraw*
avoid hate
'to detest'

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b. *odoroki-akire(ru)* co-synonymic/punctual
be.surprised be.appalled
'to be surprised'

*nare-sitasim(u)*
get used to get friendly
'to get used to and like'

*ake-kure(ru)* reversive
(day) begin (day) end
'to spend all one's time doing'

Throughout (16) and (17), regardless the variation of the internal grammatical relationship, all instantiations are morphologically uniform, with the first verb occurring in the infinitive form (called *ren'yoo*) and the second verb occurring in the root form. The former is a nonfinite verb form that a native verb takes in adverbial environments, ending in either /*i*/ or /*e*/. The root, on the other hand, is either consonant-ending or vowel-ending. As expected from the RIGHTHAND HEAD RULE (Williams 1981), the second component accommodates an inflectional suffix to mark the tense, aspect, and modality of the entire construction; for example, the present tense forms of (16) are produced by adding the suffix *-u* to the stem ending in /*s*/ or /*r*/, as in *yomi-otos-u*, *tataki-war-u*, *tobi-okir-u*, respectively. For roots ending in /*w*/, the final sound and the suffix *-u* are assimilated. When the verb root ends in a vowel, it selects *-ru* rather than *-u*, so the last example in (17) produces *ake-kure-ru* in the present tense. In short, the first pattern of verb compounding combines an infinitive form and a root according to the formal schema [X-*i*/*e* Y], where X and Y represent phonological variables to be filled with the roots of the two component verbs. In this schema, the phonological constant /*i*/ or /*e*/ can overlap with or merge with the final front vowel of the first verb root. The infinitive form occupying the compound-first position may be analyzed as an extended stem (Yuhara in press).

In addition to morphology, the subordinate, modificaitonal, and coordinate types share the garden-variety compound accent pattern (Yumoto 2005: 114-115). Thus, all examples in (16, 17) have an accent nucleus on the second component, as in (16a) *mioto's(u)*, *tatakiwa'r(u)*, (16b) *tobioki'r(u)*, (17a) *nakisake'b(u)*.

### *3.2. Pattern B*

In the same language, native verbs occur in another, superficially very similar compounding pattern here called Pattern B. Pattern B combines a pair of reversives, i.e., directional opposites denoting movement or change (such as *ik(u)* 'go' + *kur(u)* 'come,' *agar(u)* 'ascend' + *kudar(u)* 'descend') or a pair of converses, i.e., directional opposites denoting the same situation from different perspectives (such as *ur(u)* 'sell' + *kaw* 'buy,' *yar(u)* 'give' + *moraw* 'receive'). Pattern B also includes combinations of co-hyponymic verbs such as *yom(u)* 'read' + *kak(u)* 'write,' *mir(u)* 'see' + *kik(u)* 'hear,' and *nom(u)* 'drink' + *kuw* 'eat.' The following examples and descriptions thereof are taken from Yuhara (in press) with slight modifications and additional examples:

(18) verb zero-form + verb zero form
a. *uri-kai* (**uri-kaw*) converse/repetitive durative
sell buy
'to sell and buy'

*yari-tori* (**yari-tor(u)*)
give take
'to exchange (things, information), to talk, to discuss'

*yari-morai* (**yari-moraw*)
give receive
'to give and take'

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*uke-kotae* (??*uke-kotae(ru)*)
receive reply
'to receive and reply'

*uke-watasi* (*uke-watas(u)*)
receive give
'to receive and give'

b. *iki-ki* (**iki-kur(u)*) reversive/repetitive durative
come go
'to come and go'

*agari-sagari* (**agari-saga(ru)*)
ascend descend
'to ascend and descend'

*nobori-ori* (**nobori-ori(ru)*)
rise fall
'to rise and fall'

*de-iri* (**de-ir(u)*)
exit enter
'to enter and exit'

*dasi-ire* (**dasi-ire(ru)*)
put.in take.out
'to put in and take out'

*ake-sime* (**ake-sime(ru)*)
open close
'to open and close'

*b. ne-tomari* (**ne-tomar(u)*) co-hyponymic/ repetitive durative
sleep stay
'to stay at, to stay with'

*mi-kiki* (**mi-kik(u)*)
see hear
'to experience'

*nomi-kui* (**nomi-ku(u)*)
drink eat
'to eat and drink'

*yomi-kaki* (**yomi-kak(u)*)
read write
'to read and write'

As the translations show, these compounds are also asyndetic coordination of two native verbs. However, they differ from pattern A in the morphological form of the second component; here, not only the first but also the second verb occurs in the infinitive form, according to the formal schema [X-*i*/*e* Y-*i*/*e*] (as before, X and Y are phonological variables of verb roots). The parenthesized asterisks indicate that the previously observed pattern [X-*i*/*e* Y] is not acceptable, except in exceptional cases. This means that the compounds in (18) cannot be inflected word-internally; and the absence of a

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word-final stem necessitates periphrastic inflection by means of the light verb *suru* 'do,' as illustrated below.[5]

(19) Present tense inflection of the double infinitive compound

a. *yomi-kaki* → **yomi-kaku* vs. *yomi-kaki suru*
read write read write.PRES read write do.PRES
'to read and write'

b. *iki-ki* → **iki-kuru* vs. *iki-ki suru*
come go come go.PRES come go do.PRES
'to come and go'

c. *ne-tomari* → **ne-tomaru* vs. *ne-tomari suru*
sleep stay sleep stay.PRES sleep stay do.PRES
'to sleep and stay'

The morphological behavior shown above indicates that the syntactic category of the whole construction is nonconjugative verb (Ueno 2016, Yuhara in press) or verbal noun (Kishimoto and Uehara 2016).

In (16, 17), it was observed that the formal schema [X-*i*/*e* Y] (X, Y: verb root) is ubiquitous in the syntactico-semantic division of subordination, modification, and coordination. The same is true of the second schema [X-*i*/*e* Y-*i*/*e*] (X, Y: verb root); below, (20c) is reproduced from (18a), but (20a, b) are new, indicating the availability of the double infinitival schema for the relations other than coordination.

(20) a. Subordination

*ii-yodomi* cf. *ii-yodom(u)*
say hesitate say hesitate(.PRES)
'to hesitate to say'

*tori-kesi* cf. *tori-kes(u)*
take remove take remove(.PRES)
'to take back'

*obore-zini* cf. *obore-sin(u)*
drown die drown die(.PRES)
'to die by drowning'

b. Modification

*susuri-naki* cf. *susuri-nak(u)*
sniffle cry sniffle cry(.PRES)
'to sob'

*tati-yomi* cf. **tati-yom(u)*
stand read stand read(.PRES)
'to read standing up, to browse in a bookstore'

d. Coordination

*yomi-kaki* cf. **yomi-kak(u)*
= (18a)
read write read write(.pres)
'to read and write'

[5] The compound analysis of (19a) [*yomi-kaki suru*] (for example) is refuted in Yuhara (in press). His main argument that such *suru* combinations consist of two separate words is consistent with our periphrastic inflection analysis.

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The component verbs in (20a, b) are connected by the complement+head and modifier+head relations, respectively. As suggested in "cf.," some modificational examples, including the second item in (20b), pattern with the coordinative type in the absence of the [X*i*/*e* Y] form (cf. Fukushima 2005: 573-574).

However, many subordinative and modificational types have competing root-final, internally inflectable counterparts. When the two forms coexist, as in all examples in (20a) and the first item in (20b), the internal inflection usually wins over the periphrastic inflection; thus, *iiyodom-u* is judged better than ?*ii-yodomi suru*, and the same is true for the other competing pairs. This observation is explained as a case of what Aronoff (2023) calls elsewhere distribution, which arises from the operation of the Pānini's principle—periphrastic inflection is the default rule that is mobilized only when word-internal inflectional rules are unavailable. The difficulty of directly combining *suru* to these double infinitival constructs without the intervening accusative particle *o* (e.g., ?*ii-yodomi suru*/ *ii-yodomi o suru*, ?*tori-kesi suru*/ *tori-kesi o suru*) is explained away in this way.

In pattern B, the coordinate type differs from the subordinative and modificaitonal types in the accent pattern. The latter two types are accentless, while the coordinate type carries an accent on the first component, as in (20a) *iiyodomi*, (20b) *susurinaki* vs. (20c) *yomi'kaki*. As pointed out in Section 2.1, Japanese NN dvandvas also have an accent on the first component (when each component is a free morph).

### *3.3. Treatment in the literature*

The observations in the previous subsections suggest that Japanese has two patterns of VV coordinate compounding. In the first pattern, the output compounds are conjugational verbs, while the second pattern yields nonconjugational verbs. For ease of reference, they will be referred to as Pattern A and Pattern B, respectively. Their properties are summarized in Table 2.

**Table 2.** Comparison of VV coordinate compounding patterns in Japanese.

| | **Pattern A** | **Pattern B** |
|---|---|---|
| Formal schema | X-*i*/*e* Y [1] | X-*i*/*e* Y-*i*/*e* |
| Inflection | word internal | periphrastic |
| Syntactic category | verb | nonconjugational verb |
| Accent pattern | Same as the subordinate and modificational types | Same as the NN dvandva |
| Semantic relation | co-synonymic, reversive | reversive, converse, co-hyponymic |

[1] X and Y represent phonological variables to be filled with the roots of the two component verbs. In this schema, the phonological constant /i/ or /e/ may overlap with the final front vowel of the first root.

The two patterns are well known in Japanese linguistics, but our research question is entirely original and has not been addressed in the literature to date. They have been studied independently of each other, and the term "dvandva VV compounding," if used at all, tends to be equated with pattern A while pattern B is left out of the discussion (e.g., Fukushima 2005, Niinuma 2015). It is true that, given the history of research in which theories of VV compounding have been constructed based on the empirical data of conjugational verbs, the status of Pattern B as VV compounding will invite a debate; however, this point does not justify the common habit of calling Pattern A dvandva VV compounding. In a different strand of research, Bauer (2008: 10) cites *naki-sakeb(u)* (17a) and *yomi-kaki* (18c) as both VV dvandvas. In his classification (section 2.1), patterns A and B can be seen as manifestations of different dvandva subtypes in the verbal domain; for example, pattern A can be seen as co-synonymic dvandvas, as suggested by Yonekura et al. (2023: 231).

## 4. Discussion

### *4.1. Testing the prediction*

Let us recall that our prediction was that there should be VV dvandvas that behave as repetitive durative or [−B, +CI] verbs. In this section we show that it is empirically borne out by Pattern B. Pattern A, on the other hand, behaves as either non-repetitive durative or punctual verbs, i.e., [±B, −CI] verbs. Our conceptual basis is that of Lieber (2004: Ch.5), as already mentioned in section 2.2. The quantity-

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related features [B] and [CI] are used to characterize quantitative or aspectual classes among simplex verbs, not among verb phrases (Lieber 2004: 141-144), in the following way:

> I propose that the feature [B] to be used to encode the distinction between temporally punctual situations and temporally durative ones. [+B] items will be those which have no linguistically significant duration, for example, *explode, jump, flash, name.* [−B] items will be those which have linguistically significant duration, for example, *descend, walk, draw, eat, build, push*. (Lieber 2004: 137)

> Plural nouns denote multiple individuals of the same kind, nonplural nouns single individuals or mass substances. I would like to suggest that the corresponding lexical distinction in situations is one of iterativity vs. homogeneity. Some verbs denote events which by their very nature imply repeated actions of the same sort, for example, totter, wiggle, pummel, or giggle. By definition, to totter or to wiggle is to produce repeated motions of a certain sort, to pummel is to produce repeated blows, and to giggle to emit repeated small bursts of laughter. Such verbs, I would say, are lexically [+CI]. The vast majority of other verbs would be [−CI]. Verbs such as walk or laugh or build, although perhaps not implying perfectly homogeneous events, are not composed of multiple, repeated, relatively identical actions. (Lieber 2004: 138-139)

This view nicely captures the two patterns in Table 2: iterativity (pattern B) vs. homogeneity (pattern A). It is crucial to use Japanese data for our test because English VV compounds such as *blow-dry, crash-land, freeze-dry, slam-dunk, stir-fry*, etc. (see Bagasheva 2015 for a review) uniformly behave like the majority, non-repetitive verbs.

Pattern B compounds all show a habitual or repeated action interpretation in the simple past tense. For example, *yari-tori* 'give and receive' refers to the alternative multiple occurrence of the act of giving and receiving by more than one agent, in addition to a one-time giving and receiving performed simultaneously or consecutively. In the literature on English VV compounds, the distinction between simultaneous and sequential readings has been a topic of some importance, but both readings describe a single event; Pattern B differs in its multiple-event reading.

First, we examine the [−B] property of pattern B. The sentences below show that even when the component verbs are punctual, pattern B compounds are iterative-durative, accepting a time adverbial denoting a relatively long period of time.

(21) a. *Taro to Hanako wa sannen kan meeru de yari-tori sita* Converse
and TOP three year for e-mail by give-take do.PST
'Taro and Hanako exchanged e-mails for three years.'

b. *Taro wa sannen kan ie to sono byooin o iki-ki sita* Reversive
TOP three year for house and the hospital ACC go-come do.PST
'Taro went back and forth between his house and the hospital for three years.'

c. *Hanako wa hito ban zyuu sono mado o ake-sime sita* Reversive
TOP one night through the window ACC open-close do.PST
'Hanako opened and closed the window all through the night.'

d. *Hanako wa natu zyuu oba no ie de ne-tomari sita* Co-hyponymic
TOP summer through aunt GEN house at sleep-stay do.PST
'Hanako spent the summer at her aunt's house.'

The observed durativity is closely related to the iterativity or multiple occurrences of the same kind of event, i.e., the [+CI] property of Pattern B. Thus, in (18a), where the converse verbs of buying and selling denote a single situation from different perspectives, the events they describe cannot be performed *simultaneously* by one agent. While they can be performed *consecutively* by an agent in a single occasion (e.g., a situation where Taro bought something and then immediately sold it), such a

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singular reading is rarely observed when the component verbs are converse opposites. The simultaneous singular reading becomes more natural with a plural subject (e.g., situation where Taro bought something that Hanako sold). The most common reading, however, is the *habitual or repeated alternation* of buying and selling by one or more than one agents, as in the English binomial *buy and sell*. The same observation applies to the reversive compounds in (18b) and the co-hyponymic compounds in (18c); the component verbs describe events that cannot be simultaneously performed by one agent. The other kinds of singular readings seem to be possible with the former, reversive group where the semantic opposition of the components concerns physical movement. That is, the compounds in (18b) can describe sequential serial movement by one agent (e.g., a situation where Taro went to his workplace and then came home from there) and a simultaneous bidirectional movement by two agents (e.g., a situation where Taro went somewhere and Hanako returned from there). Much more common, however, are the habitual or repeated action readings shown in (21).

The quantifier *takusan* 'a lot' can quantify events in colloquial diction (Tanaka 2015: 56-59 and the references therein). The [−B, +CI] property of Pattern B is confirmed by the fact that *takusan* gives rise to the interpretation of an event-number measurement, regardless of whether the component verbs are transitive, unergative, or unaccusative:

(22) a. *Taro to Hanako wa takusan syoogaku o yari-tori sita* NUMBER
and TOP a lot small sum ACC give-take do.PST
'Taro and Hanako exchanged a small amount of money many times.'

b. *Taro wa ie to sono byooin o takusan iki-ki sita*
TOP house and the hospital ACC a lot go-come do.PST
'Taro went back and forth between his house and the hospital many times.'

c. *Hanako wa sono mado o takusan ake-sime sita*
TOP the window ACC a lot open-close do.PST
'Hanako opened and closed the window many times.'

d. *Hanako wa oba no ie de takusan ne-tomari sita*
TOP summer aunt GEN house at a lot sleep-stay do.PST
'Hanako stayed at her aunt's house many times.'

In the uncompounded state, this is not observed; the interpretation of *takusan* will be that of 'much' rather than 'many times.' Thus, as shown below, *takusan* + uncompounded verb usually measures the duration, intensity, or degree of an intransitive event and the volume of the theme/patient argument of a transitive event.

(23) a. *Watasi wa takusan {neta/naita}* DURATION, INTENSITY
I TOP a lot {slept/cried}
'I slept/cried a lot.'

b. *Kami ga takusan nobita.* DEGREE
Hair NOM a lot grew
'My hair grew a lot.'

*Kion ga takusan {agatta/sagatta}* DEGREE
the temperature NOM a lot {rose/fell}
'The temperature rose/fell a lot.'

c. *Watasi wa takusan {yatta/totta}.* VOLUME OF THE THEME
I TOP a lot {gave/took}
'I gave/took a lot.'

*Watasi wa takusan {yonda/kaita}.*

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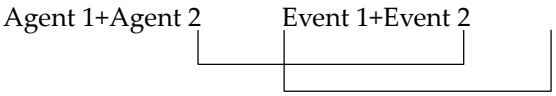
I TOP a lot {read/wrote}
'I read/wrote a lot.'

Furthermore, the [−B, +CI] property of pattern B explains the following semantic ambiguities (i), (ii):

(24) a. *Taro to Hanako ga ikkai agari-sagari sita.*
and NOM once ascend-descend do.PST
(i) 'Taro and Hanako ascended and descended together.'
(ii) 'Taro ascended and Hanako descended. ' or
'Taro descended and Hanako ascended.'

*Yamada huuhu ga ikkai sono omoi mado o ake-sime sita*
husband-wife NOM once the heavy window open-close do.PST
'Mr. & Mrs. Yamada opened and closed the heavy window together.'
'Mr. Yamada opened the heavy window and Mrs. Yamada closed it.' or 'Mrs. Yamada opened the heavy window and Mr. Yamada closed it.'

As shown by (ii), when a Pattern B compound takes a coordinated subject, either a syntactic coordination (24a) or dvandva compound (24b), it becomes possible to have a one-to-one distributive reading, roughly as shown below.




Moreover, although this is not limited to the coordinated-subject construction above, the events described by the component verbs in Pattern B need not be temporally adjacent. That is, the sentence in (24b), for example, is compatible with situations in which the window in question is opened in the morning and then closed in the evening. These observations support our view that semantically, Pattern B compounds are conceived of as being composed of *separable* similar internal units.

Pattern A, on the other hand, shows no habitual or repeated action interpretation in the simple past tense. Its examples divide into non-repetitive durative verbs such as (17a) and punctual verbs such as (17b). Importantly, here, the two constituent events (e.g., crying and screaming in (17a)) can be performed simultaneously by one agent, and it is the only reading in our judgments. As shown by the acceptable and unacceptable (*) readings in (25), it is also important to note that the two component events of pattern A cannot be associated with different agents.

(25) a. *Taro to Hanako wa niziikan naki-wameita* Nonrepetitive durative
and TOP two hour cry-scream.PST
(i) 'Taro and Hanako cried and screamed for two hours.'
(ii) *'Taro cried and Hanako screamed for two hours, respectively.'

b. *Taro to Hanako wa (*nizikan) sono sensei ni nare-sitasinda* Punctual
and TOP (two hours) the teacher DAT get used-grow intimate.PST
(i) 'Taro and Hanako got to know and like the teacher.'
(ii) *'Taro got used to the teacher and Hanako became intimate with her, respectively.'

The complete absence of the one-to-one distributive reading indicates that pattern A coordinate compounds, whether durative or punctual, denote a single event that is temporally homogeneous or internally undifferentiated. In other words, the two component verbs form a single COMPLEX PREDICATE in which the events they describe are semantically synthesized into one.

Pattern A compounds characterized by the feature composition [−B, −CI] can be combined with the quantifier *takusan* 'a lot.' However, unlike the observation in (22) with pattern B compounds, the quantification does not lead to the event-number measurement:

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(26) a. *Taroo wa takusan naki-sakenda* DURATION or INTENSITY, *NUMBER
TOP a lot cry-scream.PST
'Taro cried and screamed a lot.'

b. *Watasi wa kanoosei o takusan omoi-egaita.* VOLUME OF THE THEME, *NUMBER
I TOP possibility ACC a lot think picture.PST
'I imagined a lot of possibilities.'

This is because counting numbers requires the plural eventuality.

In conclusion, the existence of VV dvandvas is empirically confirmed. Pattern B behaves as [+CI] words just like classic dvandva compounds.

### *4.2. Treatment of Pattern A*

The remaining question concerns the treatment of pattern A: is it a subtype of dvandva compounding or a type of non-dvandva coordinate compounding? The former view would suggest that pattern A represents the co-synonymic dvandva (Yonekura et al. (2023: 231)). While we agree with the semantic analysis that motivates this view, we believe that the obvious morphophonological differences between the two patterns as summarized in Table 2 cannot be easily ignored. In Modern Greek, another dvandva-rich language, dvandvas and appositive coordinate compounds are distinguished primarily by their formal properties. The MG dvandva compounds shown in (13) consist of two bound stems connected by the characteristic compound marker *-o-*. In contrast, according to Ralli (2013: 255), the MG appositive asyndetic construction consists of two independent words and does not involve *-o-* in-between (e.g., *iθopios-trayuδistis* 'actor-singer') (see also Manolessou and Tsolakidis 2009 for the classical language).[6]

The form-based distinction becomes much more plausible and empirically grounded when attention is paid fo a further contrast between pattern A and pattern B. At the end of Section 2.1, it was observed that classic Japanese dvandvas occur in either the [free morph + free morph] or [bound morph + bound morph] pattern, and that many contemporary free + free examples have corresponding older bound + bound realizations. Significantly, this generalization applies to pattern B, but not to pattern A. As suggested in Table 3, Pattern B compounds have a bound + bound synonym; their component forms are free morphs because when viewed independently of the host construction, they occur freely in the syntax.

**Table 3.** Pattern B compounds with Sino-Japanese forms

| ***Kanji* representation** | **Native pronunciation** | **Sino-Japanese pronunciation** |
|---|---|---|
| 売+買 | (18a) uri-kai (suru) | bai=bai (suru) |
| 授+受、受+授 | (18a) yari-tori, yari-morai | zyu=zyu |
| 往+来 | (18b) iki-ki | oo=rai |
| 上+下 | (18b) agari-sagari | zyoo=ge |
| 出+入 | (18b) de-iri, dasi-ire | syutu=nyuu |
| 開+閉 | (18b) ake-sime | kai=hei |
| 見+聞 | (18c) mi-kiki | ken=bun |
| 飲+食 | (18c) nomi-kui | in=syoku |

In Table 3, the Sino-Japanese pronunciations are used in formal diction, while the native pronunciations have no stylistic restrictions. Syntactically, the Sino-Japanese forms are also non-conjugational verbs, as suggested by the parenthesized *suru* in the first example.

Now, not only pattern B but also pattern A uses the native pronunciation, but with it, the alternation with the Sino-Japanese pronunciation is much weaker. In (17), only *koi-sitaw-* can be matched with *ren=bo*, and outside (17), *oi-motome(ru)* (lit. follow-pursue) 'pursue' and *tui=kyuu* (追求)

[6] The formal difference led Ralli (2013) to conclude that the appositive construction in Modern Greek is outside morphological compounding. See also Koliopoulou (2014).

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may be relevant. Historically, pattern A may also have been associated with bound + bound synonyms, but the association is much less easily identifiable than with pattern B. This perspective sheds light on why *ake-kurer(u)* behaves as pattern A; semantically, the coordination of reversives is an odd one out in the list of (17), but the item is like the other examples in that it has no living bound + bound synonym.[7] Furthermore, it seems safe to say that most Sino-Japanese coordinate compounds that do not have corresponding native forms are cosynonyms (e.g., *too=hi* (逃避), *set=too* (窃盗)).

*4.3. Pattern A as the verbal counterpart of appositive coordinate compounding*

If pattern A is not dvandva compound, then what is it? Since we have just concluded that pattern B is a verbal counterpart of the classic dvandva compounding, the most natural hypothesis would be that pattern A is a verbal counterpart of the appositive coordinate compounding. There is some empirical evidence for this hypothesis. The first piece of evidence concerns the quantity-related features [B, CI]. The observations in the previous section show that Pattern A compounds carry the feature complex [±B, −CI]; and indeed, the same is true of appositive coordinate compounds. Typical English examples denoting occupations or other human roles, such as those in (2), are [+B, −CI] when functioning as syntactic arguments:

(27) a. *I met a singer-songwriter.*
b. *We hired three singer-songwriters.*

Next, the comparison between (24) and (25) showed that the composition process of pattern A requires that the subject slots of the component verbs be referentially identified and that the output of this process is a single complex predicate. It is striking that the same descriptions apply to appositive coordinate compounds in nonverbal copular constructions, such as:

(28) a. *John is a poet-painter.* English
b. *John est (un) poète-peintre.* French
(29) a. *Sue and Ken are poet-painters.* English
b. *Sue et Ken sont (des) poètes-peintres.* French

As detailed in Roy (2013), English and French differ in the obligatoriness of the article on the nominal predicate, but both in (28a, b), John is a poet and a painter. And crucially, in both (29a, b) the same predication applies to Sue and Ken, respectively; in neither language is the one-to-one distributive reading, Sue is a poet and Ken is a painter, is acceptable. This observation suggests that *poet-painter* and the like are single complex predicates that are predicated of one subject entity. That is, just like Pattern A compounds, appositive compounds follow the basic predicate compounding rule that the argument structures of the input predicates should be synthesized into one.[8] In the LSF, this rule is called the principle of coindexation:

(30) Principle of Coindexation
In a configuration in which semantic skeletons are composed, coindex the highest non-head argument with the highest (preferably unidexed) head argument. Indexing must be consistent with semantic conditions on the head argument, if any. (Lieber 2016b: 41)

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[7] The example *ake-kure(ru)* in (17b) is based on a pair of reversive verbs denoting the rising and falling of the sun. Although the process of the semantic extension underlying its meaning of 'spend all day doing something' are not entirely clear to us, the compound does not allow a consecutive serial action reading or a one-to-one distributive reading.

[8] This is a topic of much debate in the literature on VV compounding (e.g., Kageyama 1993, Fukushima 2005, in press, Yumoto 2005, among others, for Japanese VV compounding in the [X-*i*/*e* Y] form; Packard 2000: 250-258 for Mandarin Chinese VV compounding).

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When merging two nominal predicates such as *poet* and *painter*, this principle works as follows: the subject argument of the predicate *poet* is coindexed with that of the predicate *painter*. At the same time, the so-called body features, which are bundles of semantic features that each represent bits of encyclopedic information about poets and painters, are also merged into one. These processes produce the predicative appositive compound shown in (28, 29).

Continuing with pattern A compounding, it combines two synonymous intransitive or transitive verbs, as shown by the following reorganized list of the examples in (17):

(31)a. *naki-sakeb(u)* intransitive + intransitive
cry scream
'to cry and scream'

*naki-wamek(u)*
cry scream
'to cry and scream'

*ukare-sawag(u)*
be.excited be.noisy
'to be noisy'

*hikari-kagayak(u)*
shine shine
'to shine'

*ake-kure(ru)*
(day) begin (day) end
'to spend all one's time doing'

b. *omoi-egak(u)* transitive + transitive
think picture
'to imagine'

*nageki-kanasim(u)*
lament be.sad
'to mourn'

*tae-sinob(u)*
bear endure
'to bear'

*koi-sitaw*
long for-adore
'to long for, to miss deeply'

*imi-kiraw*
avoid hate
'to abhor'

*odoroki-akirer(u)*
be.surprised be.appalled
'to be surprised'

*nare-sitasim(u)*
get used to get friendly
'to get used to and like'

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In group (31a), the single subject argument of the head is identified with that of the nonhead. In this respect, the same mechanism underlies the production of predicative appositive compounds and intransitive pattern A compounds.

In her contribution to the *Oxford Handbook of Compounding* (Lieber and Štekauer 2009), R. Lieber attempts a unified cross-categorial analysis of English NN compounds and Japanese VV compounds. After showing how the feature-based approach successfully describes English subordinate, modificaitonal, and appositive compound nouns, she goes on to show "that at least some sort of V+V compound that is common in Japanese is amenable within the system developed here with no added machinery" (Lieber 2009: 100). In the LSF, the process of ENDOCENTRIC compounding is conceived as a kind of Merge, a process of combining the two-stratum semantic representations of the inputs into one meaningful similarly two-stratum representation (Lieber 2009, 2016b). The skeleton contains the grammatical-semantic features and argument structure of the lexeme, while the body contains its encyclopedic features. Thus, the appositive coordinate compounding and the intransitive pattern A compounding will proceed as follows:

- appositive coordinate compound (for the predicative use)[9]
- *poet* *painter* *poet-painter*

[+material (*x*)] + [+material, +dynamic (*i*)] → [+material, +dynamic (*x*=*i*)]
Body Body synthesized Body

- intransitive Pattern A compound
- *naki-* *sakeb-* *naki-sakeb-*

[+dynamic (*x*)] + [+dynamic (*i*)] → [+dynamic (*x*=*i*)]
Body Body synthesized Body

The bracketed representations are skeletons; the italicized variables are arguments, while *x*=*i* stands for the fact that the two arguments are co-indexed. The same analysis can be extended to certain A+A combinations, including the apparently mysterious English compound *old-new* in the following passage (David Crystal, *The Cambridge encyclopedia of the English language* 3rd ed., 2019, Cambridge: Cambridge University Press, p.72):

(32) *Hearing the play in OP [Original Pronunciation], according to Ben, offered a new auditory experience of an old play that neatly complemented the 'old-new' interpretation provided by Richter's reworking of Vivaldi.*

As Osamu Koma rightly pointed out (personal communication, March 2023), *old-new* in (32) is puzzling because the antonymic opposites do not constitute an exocentric dvandva like (5). Rather, it says that something is old and new at the same time. If so, in this case, the antonyms are compounded by the same mechanism as appositive and intransitive Pattern A compounds.

The verbal compounding for group (31b) shows not only the identification of the subject argument of the head verb with that of the nonhead verb (*x*=*i*), but also the identification of the object arguments (*y*=*j*):

- transitive Pattern A compounding
- *omoi-* *egak-* *omoi-egak-*

[+dynamic (*x*, *y*)] + [+dynamic (*i*, *j*)] → [+dynamic (*x*=*i*, *y*=*j*)]
Body Body synthesized Body

Nevertheless, in all the cases discussed, we observe the complete identification of the arguments of the components. It is in this respect that these NN/VV coordinate compounds differ minutely from

[9] Discussed in Lieber (2009, 2016b) are attributive compounds in the argumental use where the components' R(eferential) arguments get coindexed. In the suggested analysis below, we assume that nominal predicates possess a subject argument while lacking an R argument.

the subordinate and modificational NN/VV compounds (Lieber 2009, 2016b; see also Fukushima 2009 and Yumoto 2009 on this issue).

In sum, there are empirical and theoretical reasons to believe that pattern A coordinate compounding is a verbal counterpart of the appositive coordinate compounding.

Before closing this chapter, a word about the process of Pattern B compounding would clarify the whole picture. EXOCENTRIC compounds can also be divided into the subordinate, modificaitonal, and coordinate types (Scalise and Bisetto 2009); thus, *pickpocket*, *cutpurse* etc. belong to the subordinate type, *airhead*, *hardhat* ('a reactionary or conservative person') etc. belong to the modificational type, and dvandvas represent the coordinate type. Drawing on Lieber's (2016b: 51-52) metonymy-based analysis, it is possible to regard the subordinate and modificational exocentric compounding as a multitasking process, in which (i) the usual endocentric compounding governed by the principle of coindexation and (ii) an extrinsic feature-adding process are carried out simultaneously. If so, then dvanvas or coordinative exocentrics are special just in that the first of these processes is absent. As suggested in section 2.2, we consider dvandva formation to be an exocentric compounding characterized by the addition of the [+CI] feature to the entire representation, but within which N1 and N2 or V1 and V2 are not coindexed with each other. Ultimately, this would be the reason why the two components of dvandvas, including Pattern B compounds, are more or less independent of each other phonologically, semantically, and syntactically.

## 5. Conclusions

In summary, this paper has considered the parallelism between binominal and biverbal constructions in coordinate compounding. On the empirical side, it has been shown that the appositive-dvandva distinction is possible among VV compounds. While this paper has focused on NN and VV, the same seems to hold for AA coordinate compounding, considering examples such as (5) (dvandva) and (31) (non-dvandva). On the methodological side, hurdles in comparing NN and VV compounds that necessarily arise from syntactic-category-specific constraints can be overcome by taking advantage of a set of semantic features and the decomposition method that uses them. On the other hand, this paper remains agnostic about one of the traditional concerns, namely the exact positioning of the constructions under study on the word-phrasal constructional boundary. For example, Japanese coordinate compound nouns in the native lexical stratum phonologically deviate from subordinate and attributive counterparts, and some scholars attribute the deviation to an above-$X^0$ status. Of course, the interaction between syntax and morphology is yet another important issue that spans binominal and biverbal lexical constructions (Kageyama 1993, 2009, Matsumoto 1996, Fukushima 2005, Nicholas and Joseph 2009, Kiparsky 2010, Ralli 2013, Masini and Thornton 2014, Koliopoulou 2015, Spencer 2019, Masini et al. 2023, Yuhara in press), but property addressing it is beyond the scope of this investigation.

## List of abbreviations

A: adjective
ACC: accusative
[+B]: a semantic feature that stands for "bounded" in the LSF. When a word has this feature, it is bounded in space or time.
[+CI]: a semantic feature that stands for "composed of individuals" in the LSF. When a word has this feature, it is conceived of as being composed of separable, similar internal units.
CM: compounding marker
COORD: coordinate compounding or coordinate compounds
DAT: dative
DU: dual
GEN: genitive
LSF: Lexical Semantic Framework
MOD: modificational compounding or modificational compounds
N: noun
NOM: nominative
PST: past tense

PL: plural
PRS: present tense
R argument: referential argument
SUB: subordinate compounding or subordinate compounds
TOP: topic
V: verb

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