Relational adjectives in English and Japanese and the RA vs. PP debate

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1. Introduction[1]

Relational adjectives ("RA" hereafter) constitute one of the representative, highly productive word-formation types in many European languages and have long been a matter of debate for their mismatch between morphology and semantics. Morphologically, RAs are adjectives, but semantically they do not express property. Rather, by modifying a noun, which is their sole or principal syntactic distribution, they express an intrinsic relation between two entities, one denoted by their base noun and the other denoted by the modified noun. As a result, a possibility arises that the combination of an RA and a modified noun competes with other forms of nominal modification. The aim of this paper is to examine the possibility of RA in Japanese in light of the competition debate on RA in European languages (Rainer 2012, 2013; ten Hacken 2013) and show that the definition of RA should be sought in their grammatical and semantic functions as direct modifiers (Sproat and Shih 1988; Cinque 2010) rather than in their adjectival forms.

What constitutes the most important empirical observation is that if we define RAs as above, i.e. derivatives which are morphologically adjectives but semantically denote an entity or a relation, Modern Japanese totally lacks RAs. All of its denominal adjective-deriving suffixes, including *-teki*, the derivational suffix discussed as an RA suffix by Bisetto (2010: sections 3 and 5), form qualitative adjectives (QAs), i.e. words that participate in modification with the *-i* or *-na* inflectional ending (Nishiyama 1999) and express a gradable property or quality of the modified noun. When modifying an action nominal, they do not allow any argument-structure interpretation (cf. *presidential {election/lie}* (Giegerich 2009)). The inflectional ending *-na*, in particular, is an unambiguous marker of the QA-status; *-teki* derivatives always select this inflectional suffix (see section 3.1 for the status of *-na*) (see fn. 18).

Thus, Japanese cannot form RAs with derivational adjectival suffixes. However, if we focus on the function of RAs as direct modifiers (Sproat and Shih 1988; Cinque 2010), we notice that Japanese productively forms this type of modifier by attaching the genitive particle *no* to a noun (Watanabe 2012). For example, material/nationality-denoting modifiers take RA forms in English but "N-*no*" forms in Japanese.[2]

[1] We are grateful to the audience at MMM9 for useful comments and questions. We are solely responsible for the content of this paper. The research for this study was conducted under the financial support of Tohoku University (Tohoku Leading Women's Jump Up Project 2013) and the Japanese Ministry of Education, Culture, Sports, Science, and Technology (Grant-in-Aid (c), No. 24520417).

[2] Like genitive forms in many other languages, the genitive particle *no* is polyfunctional (see, for example, Hiraiwa 2012: 357). We will gloss *no* phonemically as NO because its functional status is the very topic of this paper. Watanabe (2012: 508, fn. 1) does not go into the status of the direct modifier *no*, suggesting it is either a genitive case marker or a linker. In section 3.3, we will propose that it is functioning as a functional postposition (P) in the sense of Baker (2003: Appendix).

(1)

a.	wheaten bread	a’	komugi-no pan wheat-NO bread ‘wheaten bread’
b.	Chinese {vase / cooking}	b’	chuugoku-no {kabin / ryoori} China-NO {vase/ cooking} ‘Chinese vase/cooking’

The following translation pairs show that the correspondence is not limited to material and nationality:

(2)

a.	triangular room	a’	sankaku-no heya triangle-NO room
b.	marine life	b’	umi-no {seikatsu / seibutsu} sea-NO {living state / living thing}

We also notice that the “N-*no*” modifier can overtly mark various semantic relations between two entities, those identified by the RA research (e.g. Levi 1978; Warren 1984), by means of dedicated relational nouns (“RN” below; cf. Adger 2013 for relational nouns), surfacing in the form “N-RN-*no*,” as in (3):

(3)

a. Chuugoku-{siki/ fuu}-no ryoori (cf. 1b’)
China-{style/ type}-NO cooking
‘Chinese-style cooking/ Chinese-type cooking’

b. komugi-{sei/iro}-no pan (cf. 1a’)
wheat-{made/ color}-NO bread
‘wheat-made bread/ wheat-color bread’

c. sankaku-kei-no heya (cf. 2a’)
triangle-form-NO room
‘room of a triangular form’

d. kai-{chuu/joo}-no seikatu[3] (cf. 2b’)
sea-{in/on}-NO living state
‘life inside the sea/ life on (or above) the sea’

The “N-*no*” forms in (1) and (2) can express several relations between two entities, like European RAs, but the “N-RN-*no*” form in (3) selectively mark one particular type of those relations. For example, (1a’, b’) are ambiguous between the formally-marked relations in (3a, b). Thus, we can assume that the *-no* modifier uniformly have the structure in (4) below, the “N-*no*” form having a covert RN. We represent *-no* as P, anticipating the upcoming discussion. The modifier with the covert RN corresponds to RAs derived by “all-purpose” RA suffixes in Europe (Rainer 2013).

(4) [P (no) [RN [Base Noun]]] (P = adposition, RN = relational noun)

Obviously, we cannot capture the cross-linguistic parallelism in (1) and (2) unless we adopt the separation hypothesis (Beard 1995), “an approach to morphology in which there is no

[3] The form *kai* “sea” in the modifier is the bound form of the noun *umi* used in (2b’).

direct connection between the side of morphology that deals with sound and the sides that deal with syntax and semantics" (Aronoff 1994: 8). If we viewed the noun-modifying syntax of RAs and the various semantic relations they express as directly connected to the formal properties of RAs, adjective-deriving suffixes to be specific, there would be no way to account for the "N-*no*" modifiers in Japanese, which are clearly not adjectival from a morphological point of view. Rather, the Japanese data suggest that the syntax and semantics (grammatical and semantic functions) of RAs are shared cross-linguistically; and the point of variation lies in how to realize those functions morphophonologically.

Notice that a similar approach is necessary even within European languages with RAs, in which the nominal modification by RA exhibits paradigmatic relationships to other forms of nominal modification. Bisetto (2010), Rainer (2013), and ten Hacken (2013) show how the occurrence and distribution of RAs in a language are closely (and sometimes intricately) interrelated with other forms of nominal modifiers used in that language. For example, according to Rainer (2013: 20, 23), Spanish uses RAs for the direct-object relation to the head action noun, as in (5a), but PP modifiers for the material ("made-of") relation, as in (5b). In (5b), we gloss the preposition *de* as DE.

(5)
a. producción platera 'silver production' (Rainer 2013: 20)
production silver-REL
b. vaso de plata / *vaso platero 'silver cup' (Rainer 2013: 23)
cup DE silver

Similarly, Szymanek (2010: 218-219) provides the following Polish translations of English N-N compounds to show that in Polish, (i) a noun phrase with an inflected noun modifier (usually in the genitive), (ii) a noun phrase incorporating a prepositional phrase modifier, and (iii) a noun phrase involving an RA modifier compete with one another to realize semantic relations expressed by compounding in English:

(6)
a. *telephone number*
i. numer telefon-u
ii. *numer do telefon-u
iii. *numer telefon-icz-n-y

b. *computer paper*
i. *papier komputer-a
ii. papier do komputer-a
iii. papier komputer-ow-y

c. *toothpaste*
i. *past-a zęb-ów
ii. past-a do zęb-ów
iii. *past-a zęb-ow-a (Szymanek 2010: 218)

As far as these three sets are concerned, they suggest a function-form paradigm in which the "part/whole" relation is expressed by a genitive modifier, while the "intended for" relation is expressed by PP or RA modifiers, with the PP option being a default.

Taking the separation hypothesis, this paper attempts to account for the relationship between RAs in English and "N-*no*" forms in Japanese as a morphophonological variation of

the common functional structure (or the base structure in Beard (1995)) of direct modifiers. As a fundamental explanation of this type of cross-linguistic variation, we will also discuss why Japanese cannot realize the direct modifier in an adjective form. Our proposals can be summarized as follows:

- RAs and the "N-*no*" forms are forms that PP adjuncts (Beard 1995: chapters 10-12) take in direct attributive modification. RA suffixes in European languages are bound realizations of P or P+RN in (4). That is, Japanese agglutinatively marks RN and P in (4), but RA languages have synthetic, suffixal markers for these elements.
- The inventory of derivational morphology in a language correlates with the conflation patterns of its basic vocabulary. Derivational RA suffixes are rich in languages whose basic adjectives do not conflate Pred (Bowers 1993). Japanese adjectives clearly differ from European adjectives in the conflation of Pred (e.g. *aka-i* lit. red-Pred 'be red'). Because canonical adjectives in Japanese inherently comprise Pred, its derivational morphology also produces such predicative adjectives.

Section 2 will survey the syntactic, semantic, and morphological properties of direct modification (section 2.1) and analyze RAs in English in light of those properties (section 2.2). In section 3, we will first demonstrate the morphological difference between Japanese and English non-derived adjectives (section 3.1) and show how and why RAs in English correspond to the *no* forms in Japanese (sections 3.2 and 3.3).

2. RAs in English

2.1. Two types of nominal modification: Indirect and direct modification

One of the recurrent questions about nominal modification is the grammatical status of the modifier and the unit size of the modifier + modifiee combination as a whole. At the phrasal level, the distinction between direct and indirect modification has been widely assumed since Sproat and Shih (1988), while at the word level, modificational compounds or what Scalise and Bisetto (2009) call ATAP compounds ('attributive and appositive' compounds) have been attested in many languages. Thus, the intersective vs. non-intersective interpretational ambiguity exhibited by the adjectival modification in (7) below constitutes the classic piece of evidence for the indirect vs. direct modification distinction at the NP/DP level, while the pairs in (8) are often cited as attesting to phrasal modification vs. compounding modification.

(7)
a. a beautiful dancer
i. 'a dancer who is beautiful'
ii. 'a person characterized by beautiful dancing'
b. an old friend
i. 'a friend who is old'
ii. 'a person characterized by old friendship'

(8)
a. a blàck bóard vs. a bláckbòard
b. a dàrk róom vs. a dárkròom
c. a gréen hóuse vs. a gréenhòuse

The minimal pairs like those given above strongly indicate that the grammatical status of an adjective, whether it functions as a predicative or indirect-modifier adjective, as a non-predicative or direct-modifier adjective, or as a compound constituent, depends on the adjective's hierarchical closeness to the modified noun, i.e., which position it occupies in the NP (DP)-internal syntactic structure. Crucially, (7) and (8) show that one and the same adjective can function as a predicative, non-predicative, or compound-constituent modifier, which means that the tripartite status distinction is not an inherent property specified for each adjectival item but a property emergent from the adjective's relative closeness to the head noun. In this paper, we focus on the relationship between indirect and direct modifiers, referring readers to Nagano (2013: section 4) for the relationship between these phrasal modifiers and modificational compounds.

The syntactic difference between the two uses of each adjective in (7a, b) becomes evident once we compare their word-order flexibility. The intersective reading is not affected by moving the adjective to a higher prenominal position, as in (9a), or to the postnominal position, as in (9b).

(9)

a. a beautiful, enchanting dancer
   an old stingy friend

b. a dancer especially beautiful today
   a friend old for her age

On the other hand, the non-intersective reading is not available in these adjectival configurations; *an old stingy friend* in (9a), for example, cannot refer to a stingy person characterized by old friendship or a person characterized by old stingy friendship. Direct modifier adjectives are governed by rigid word-order restrictions. First, the direct modifier occurs closer to the head noun than the indirect modifier. According to Cinque (2010: 22), a cross-linguistic generative study of the syntax of adjectives, the two types of adjectives occur in the following relative orderings with respect to D (Determiner) and the head noun in Germanic and Romance languages:

(10)

a. Germanic languages
   D > indirect-modifier > direct-modifier > Noun > indirect modifier

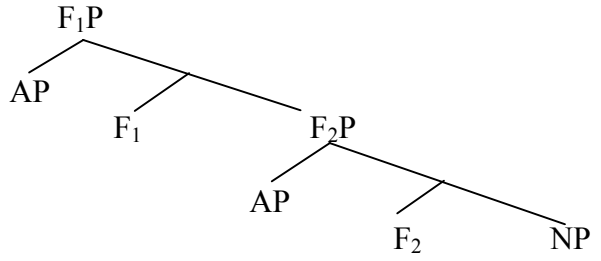
b. Romance languages
   D > direct-modifier > Noun > direct-modifier > indirect-modifier

Next, direct modifiers can be stacked, but according to Scott (2002), their ordering needs to follow the following semantics-based hierarchical order with respect to the head noun (Scott 2002:114):

(11) *Hierarchy of attributive adjectives*
Subjective comment > ?evidential > size > length > height > speed > ?depth > width > weight > temperature > ?wetness > age > shape > color > nationality/origin > material

Cinque (2010: 37-41) proposes to capture this ordering restriction by positing semantically defined adjunct positions in the NP structure, as follows:

(12)

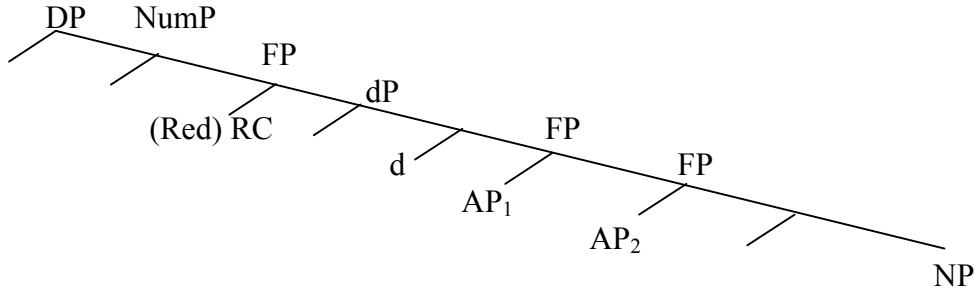


Because each adjunct site accommodates only one direct modifier, this syntactic structure can account for both the relative ordering among direct modifiers given in (11) and the fact that the same semantic type of direct modifier cannot be iterated. Thus, when an identical prenominal modifier occurs twice, as in (13) below, the modification is interpreted either as the repetition of an indirect modifier or as the combination of indirect and direct modifiers. Interpreting both occurrences as direct/non-predicative type is usually not possible.

(13)
a. a criminal criminal lawyer
b. a beautiful beautiful dancer
c. I missed the Thursday Thursday lecture ((13c) from Cinque 2010: 26)

The above discussion makes it clear that predicative and non-predicative uses of canonical, morphologically simple adjectives derive from their syntactic or hierarchical positioning; the former use is licensed in the outer domain in the DP, whereas the latter use is licensed in the inner domain in the DP, positions closer to the head noun. Technically, we will capture this difference by adopting the mainstream view that indirect modifiers are reduced relative clauses, while direct modifiers directly merge with the head noun. According to Cinque (2010: 33-34), the two DP domains are demarcated by a small indefinite dP, as depicted below (Cinque 2010: 34):

(14)



A relative clause (RC), full or reduced, merges above the indefinite d head; and this head functions as the head of the relative clause itself. On the other hand, the direct modification structure in (12) comes below the d head. Cinque claims that the positional difference with respect to the d head can also account for the series of semantic differences between indirect and direct modification (Cinque 2010: chapter 2), the differences which Bolinger (1967) reduces to the difference between Reference modification (i.e. AP modifying the reference of the NP) and Referent modification (i.e. AP modifying the referent of the NP):

> If we think of d as assigning some referential import (though not the uniquely individuating referential import of the higher D, which marks the (maximal) intersection of the set contributed by dP and the set contributed by the relative clause), it is evident that direct modification adjectives, which are below d, modify something that is still predicative in nature, while (full and) reduced relative clauses, which are higher than d, modify something that already has some referential status (Cinque 2010: 34).

Under this view, indirect modification leads to intersective interpretations such as (7a/b i) because it attributes a property to the head noun as a referential argument, whereas direct modification leads to non-intersective interpretations such as (7a/b ii) because it further specifies the kind denoted by the head noun; it names a specific subclass of the kind denoted by the head noun.[4]

We have seen the syntactic and semantic properties of direct modification based on Cinque (2010). In addition, Baker (2003: section 4.2) points out that direct modification exhibits the following morphosyntactic properties:

(15)

a. Syntactic category of the modifier: The syntactic category of a direct modifier is A.
b. Agreement between the modifier and the modifiee: Overt or covert agreement between the modifier and the modified noun is necessary to the existence of direct modification, functioning as a sort of glue between them.
c. Syntactic size of the modifier: A direct modifier has a small structure (cf. Sadler and Aronld 1994). A direct modifier is similar to an incorporated head in that they are "both very small pieces of syntax, typically consisting of only a single X^0" (Baker 2003: 274).

In order to make sense of this cluster of grammatical properties, we need to make a crucial divergence from Cinque (2010) concerning the presence of a functional head between the direct modifier and the modified noun. (12) and (14) show that Cinque assumes its presence.[5] In this paper, however, we follow Baker's (2003: section 4.2.2) view that direct modification is closely related to the nature of the syntactic category A as a defective category. Baker claims that the syntactic defectivity enables adjectives to directly merge with the head noun, with no functional structure mediating the relation (as an instance of Bare Phrase Structure) and suggests that the modifier-modifiee agreement is necessary, as stated in (15b), as a morphological support for the direct Merge relationship.

Under this view, the modifier-modifiee agreement is a morphological compensation for the lack of any functional structure in-between (see also Emonds 2000: 309, fn. 29). Being a defective syntactic category, adjectives can share the same phi-features as the head noun.[6] This feature-sharing licenses the direct merge relationship between the adjective and the head noun. In addition, in order to properly inherit the phi-features of the head noun, the modifier must be not only A in category but also small in size. That is, direct modifiers assume an incorporated head size in order to properly agree with the head noun; if the modifier had its own syntactic dependents such as arguments and adjuncts (see e.g. (9b)) or its own phi-

[4] In other words, direct modification is a type of kind modification (cf. Gehrke 2012; Snyder 2012). See Snyder (2012: 85) for the semantic definition of kind.

[5] Cinque does not specify the type of the functional head, though. See Rubin (2003) for the difficulty of identifying the category label of the supposed functional head for adjunction.

[6] See Anderson (1992: section 5.1) for the distinction between modifier-head agreement and predicate-argument agreement. While the latter type of agreement can be construed as feature-copying, the former type is "the passing of feature specifications within the structure of phrasal categories" (Anderson 1992: 111), so that the identity of features obtains between the modifier and modifiee phrases.

features, it could not inherit the feature specifications of the modified head. Moreover, the significance of modifier-modifiee agreement motivates the reference modification property of direct modifiers discussed above; sharing the phi-features of the head noun, adjectives can provide purely semantic labels necessary for the subclassification (or further specification) of the kind concept denoted by the head noun.

The licensing of direct modification by modifier-head agreement rather than by a functional head is confirmed by the following formal alternation that transitive adjectives exhibit in indirect and direct modification:

(16)
a. a country (which is) rich in oil
a' an oil-rich country / *a rich in oil country
b. people (who are) proud of their houses
b' house-proud people / *proud of house(s) people
c. a child (who is) prone to accidents
c' an accident-prone child / *a prone to accident(s) child
d. troops (that are) weary of wars
d' war-weary troops / *weary of war(s) troops

Transitive adjectives take a compounded A^0 form in the direct modifier position, as in (16a'-d'), because they must agree with the head NP in that position.[7] If their internal arguments are projected as PPs, as in the right-side forms in (16a'-d'), it obliterates the feature inheritance from the head NP, hence the ungrammaticality of these forms. By compounding the internal argument, transitive adjectives can occur adjacent to the head NP. Also significant for the feature inheritance is the fact that the Number distinction of their internal arguments is lost in compounded form; as in (16b'-d'), even count nouns occur in the default singular form. The same factor underlies the A^0 vs. AP alternation based on adjectives taking a measure phrase in (17) below, and the A^0 vs. VP alternation based on stative (or passive) verbs in (18) below ((17) and (18) from Nagano (2013: 117)):

(17)
a. a girl who is {ten years old / *ten-year-old}
a' a {ten-year-old / *ten-years-old} girl
b. a pole that is {three feet long / *three-foot-long}
b' a {three-foot-long / *three-feet-long} pole

(18)
a. packages that {look suspicious / *are suspicious-looking}
a' suspicious-looking packages
b. a company that is {based in Britain / * British-based}
b' a British-based company

The prenominal modifiers in (17a',b') and (18a',b'), which are all attributive-only compounded adjectives, exhibit forms fit for agreement with the head NP. For instance, the measure noun occurs in the default form in (17a',b'), and the toponymic noun occurs in the adjectival form in (18b').

[7] See Marchand (1969: 84) and Yumoto (2009) for further examples of this type of compounds. We do not discuss whether this compounding belongs to incorporation or not.

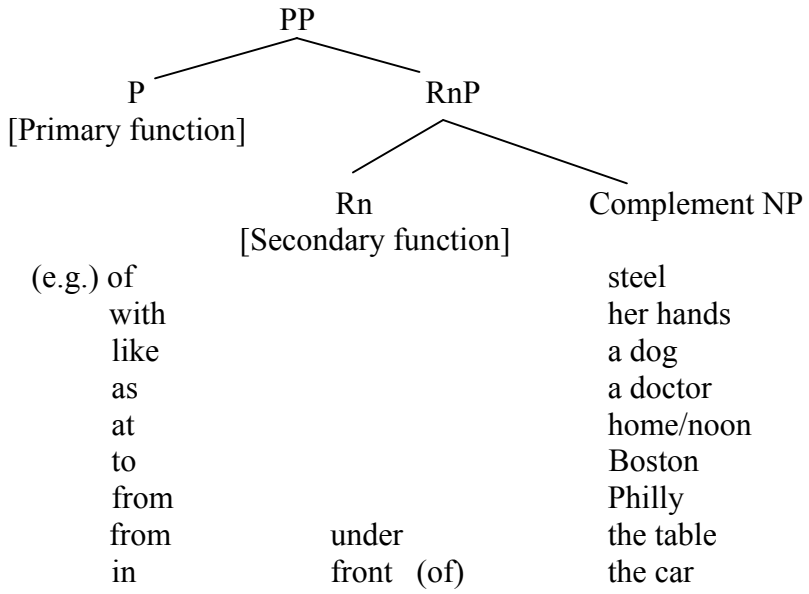
2.2. RA and PP as denominal direct and indirect modification

In the previous section, we have seen that canonical non-derived adjectives in English possess predicative and non-predicative usages due to the dual source of syntactic nominal modification: relative clause modification and direct merge modification. We have also seen that this syntactic distinction corresponds to the formal AP (or stative VP) vs. A^0 distinction due to the agreement condition on direct merge modification. As long as one and the same adjective exhibits the two usages based on its syntactic contexts, the distinction can be seen as a kind of inflection, contextual inflection in particular (Booij 1996).[8]

These facts provide a new perspective on non-canonical, denominal adjectives called RAs. The A^0 size and the limited syntactic occurrence of RAs suggest that RAs are direct-modifier forms of certain adjunct functions which take distinct phrasal forms in indirect modification. In their attempts to integrate Case systems and P (adpositions), Beard (1995: chapters 10-12) and Emonds (1985: 223-237 and 2000: section 7.4) propose a consistent treatment of two types of indirect modifier forms attested across languages: so-called semantic Case-marked NPs and adjectival/adverbial PPs. In particular, Beard (1995: 253) claims that "Case is present only to mark grammatical functions, where the means of marking may be affixational or adpositional".[9] Based on this view, we propose that the grammatical functions formally marked by semantic Case affixes or PPs in indirect modification are formally marked by A^0-forming morphology in direct modification, including compounded adjectives such as those we saw in (16a'-d'), (17a',b') and (18a',b') and RAs. In our view, RAs do not have a predicative usage because they are word-forms that adjunct PP structures take in direct modification; in the predicative, relative clause context, the same structures take full PP manifestations.

Following Beard (1995: 280), we assume that semantic Case functions correspond to PP base structures, in which the relationships between primary functions (i.e. obligatory nominal grammatical functions), secondary functions (i.e. optional nominal grammatical functions) and Case-bearing NPs are represented hierarchically:

(19)



[8] Indeed, Cinque (2010: Appendix) shows that inflection-rich languages formally distinguish canonical adjectives in direct and indirect modification.

[9] See Beard (1995: Appendix A) for the list of all the grammatical functions attested in Indo-European Case systems.

As formulated as the Grammatical Function Criterion (Beard 1995: 268), all NPs must bear one primary grammatical function; and NPs with a primary function may bear one additional secondary function. Semantically, secondary functions provide further specifications to primary functions. Morphosyntactically, Beard's (1995: section 10.4) empirical data show that the distinction between primary and secondary nominal functions is a case of the widely attested bipartition of functional categories into "purely" functional ones and "semi-lexical" ones (Emonds 1985, Corver and van Riemsdijk 2001, Corver 2008, among others).[10] Most tellingly, primary functions can be zero-marked (cf. fn. 14), whereas secondary functions need overt marking. Thus, in the spatial adjunct domain, primary functions such as Location and Goal may be zero-marked, as in (20a) below, but secondary functions such as Inession and Subession must be marked overtly, as indicated in (20b).

(20)
a. She stayed home. He went home.
b. The ball rolled from *(under) the table.

In order to capture this difference, we use the label "Rn" (relational noun) for the syntactic position accommodating secondary functions; the Rn head is a generalized version of the Axial Part head Svenonius (2006, 2010) posits for spatial PPs. The semi-lexicality of the relational noun *front* in (19) is demonstrated by the following contrast (Svenonius 2006: 49-50):

(21)
a. There were kangaroos in {front / *fronts} of the cars.
b. There were kangaroos in the {front / fronts} of the cars.

Compared to *front*, *under* is closer to a purely functional P in directly taking its complement, but its lexical character can be detected in allowing the following NP usage (Baker 2003: 304-305, fn.1):

(22)
a. Under the elm is a nice place for a picnic.
b. I prefer under the maple.

In indirect modification, the base adjunct structure in (19) can be realized as a PP and/or as a Case-marked NP,[11] but direct modification requires its A^0 realization due to the agreement requirement discussed in (15b). This is made possible by conflating or incorporating the complement NP up to the P head in the structure (19). The conflation and incorporation result in representations like (23) and (24), respectively:

(23) Conflation in (19) leads to:
a. [NOUN + Primary function]
b. [[NOUN + Secondary function] + Primary function]

[10] Tănase-Dogaru (2011) surveys diagnostic criteria for semi-lexicality.
[11] We use the conjunction "and/or" here because the number of Case functions and the number of morphological exponents are not necessarily the same. As the structure (19) shows, Case functions that define adjuncts are maximally two, but "the maximum number of Case endings and/or Ps in a PP is the maximum number allowed by the MS component to mark two functions; this seems to be about four" (Beard 1995: 272). See also the discussion and data in Nikolaeva and Spencer (n.d.).

(24) Incorporation in (19) leads to:
a. [P [Noun]]
b. [P [RN-Noun]]

We do not go into the details of the distinction between conflation and incorporation (see, for example, Baker 2003: section 2.9 and 167-169). What is important here is that the base adjunct structure in (19) can give rise to syntacticosemantc representations for A^0 realizations through the widely-attested processes of conflation and incorporation. Beard and Volpe (2005), for example, utilizes a function-conflation process similar to (23) in order to derive the agent nominal *baker* from the same base structure as the indirect modification *a person who bakes*. In our case, the output syntactic category A comes from the P head, which is the AP-forming (or adjunct-introducing) functional category as discussed in Beard (1995: chapter 12) and Baker (2003: 324-325).[12] (23a) and (24a) represent cases when the base structure does not have a secondary function, while (23b) and (24b) come from cases when it does.

The following data show that English employs conflation for the A^0 realization of the base structure (19) ((25) and (26) from Nagano 2013: 123):

(25)

a.	*presidential* plane/election/lie	a’	plane/election/lie *of the president*
b.	*cellular* structure	b’	structure *of cells*
c.	*dental* disease	c’	disease *of teeth*
d.	*woolen* fabrics	d’	fabrics *of wool*
e.	*bearded* man	e’	man *with beard*
f.	*southern* exposure	f’	exposure *to the south*
g.	*Belgian* law	g’	law *of Belgium*

(26)

a.	*preadverbial* expression *pre-Chaucerian* literature	a’	expression *in front of an adverb* literature *before Chaucer*
b.	*postnominal* adjective	b’	adjective *after a noun*
c.	*intra-organismal* and	c’	struggle *within and between organisms* *interorganismal* struggle
d.	*sub-Saharan* Africa	d’	Africa *below the Sahara*
e.	*suprasegmental* phonemes	e’	phonemes *above segments*
f.	*a trans-global* expedition	f’	expedition *across the globe*

The RAs in (25a-g) are forms realizing the conflated representation in (23a); the underlined suffixes are realizations of Primary functions. The parasynthetic RAs in (26a-f) are forms realizing the conflated representation in (23b); the underlined suffixes realize Primary functions, while Secondary functions are realized by the spatio-temporal prefixes, bound forms of the relational nouns used in the corresponding indirect-modifier PPs (see Nagano 2013: section 3 for details). In the pairs in (26a/a’), for example, the suffix *-al* and the adposition *in* realize the same primary function of Location, while the prefix *pre-* and the relational noun *front* realize the same secondary function of Anteriority.[13]

[12] As an important ingredient of his semantic Case analysis, Beard (1995: chapter 12) advances the Defective Adjective Hypothesis, according to which PPs are a subclass of APs.

[13] In the PPs in (26b’-f’), the primary and secondary functions are fusionally marked by the prepositions. That is, underlying relational nouns for secondary functions (e.g. *after* in 26b’) are conflated into the P head in (19).

Because the primary function can be marked covertly,[14] the modifier-head combinations in (27) and (28) below can also be viewed as direct modifications realizing (23a,b), respectively.

(27)
a. *steel* bridge, *corduroy* suit, *duck* soup, *gold* medal, *iron* rod, *rubber* boots, *wood* floor
b. *autumn* leaves, *September* morning, *summer* palace, *Arab* policies/philosophy, *garage* door, *library* curtains, the *New Zealand* economy, *Tiffany* lamp, *US* ambassador

(28)
a. *pre-Easter* season, *pre-railroad* world, *post-lunch* coffee, *anti-tank* gun, *anti-trade* wind, *cross-border* traffic, *inter-island* steamer, *interstate* affairs, *pro-tariff* reform, *sub-bottom* echo, *subsurface* waters, *superstandard* risk, *trans-earth* orbit, *trans-world* airline
b. *after-dinner* mint, *before-tax* book profits, *between-class* break, *off-campus* extension courses, *on-base* military club, *on-board* modem, an *underground* passage

The primary function in (27a) is Material, which is overtly marked by an RA suffix in (25d). The primary functions zero-marked in (27b) and (28a,b) are Location and Temporal. The following additional example shows that even Possession function, which is usually marked by the RA suffix *-ed* as in (25e) and (29b), can be zero-marked in English:

(29)
a. In the other corner was the aforesaid *three-corner* table adorned with a fat, red velvet pin-cushion hard enough to turn the point of the most adventurous pin. (From *Anne of Green Gables* by Lucy Maud Montgomery (1908)).
b. a three-cornered table

The secondary functions in (26) and (28) are further specifications of the Location or Temporal primary functions, but the following data indicate that the preposition *of*, which realizes primary functions such as Possession, Measure, and Partitivity, can also take relational nouns to specify its secondary (sub-classificatory) functions (Schwarzschild 2006: 106):

(30)
a. an Iranian 16th century brass *boat-shaped* vessel (Feist 2012: 116),
her tawny, *almond-shaped* eyes (BNC), an *onion-shaped* dome
b. a *medium-sized* city, a *life-size* dinosaur, an *economy-size* package, a *pocket-size* dictionary, a *middle-size* bank, *bite-size* fried chicken
c. a *four-color* photograph, granular phosphatic limestone and *dove-colored* limestone, a *green*/*peach color* scheme, the thin *coffee-colored* dress (BNC)
d. a *three-foot* pole (cf. a *three-foot-long* pole), 5 *pound* paper

In sum, we have shown that RAs are direct-modifier realizations of the adjunct base structure in (19). RAs do not occur in indirect modification because in this syntactic context, the same structure is realized in PP forms. The prenominal positioning of RAs follows from the word-order property in (10a), while their kind-specifying semantics (McNally and Boleda 2004)

[14] The zero-marking of P in (19) may depend on the morphological typology of the language at issue. English is well known for its tolerance for zero derivation, and the zero-marking of the P head, the AP-deriving category, is also tolerated (especially when P = *of*, *at*, or *to*) (see e.g. Collins 2007). As we will see in the next section, Japanese does not allow the zero-marking of P.

belongs to Reference modification, the non-intersective, classificatory interpretation that section 2.1 attributed to the hierarchical relationship between the direct modifier and the indefinite d head.

3. The *no* modifiers in Japanese

The aim of this section is to confirm the analysis of English RAs in section 2 from a cross-linguistic point of view. We have claimed that RAs should be viewed not as lexemic members of an independent subclass of the category A but as grammatical word-forms that adjunct PPs take in direct modification contexts. This view is strongly supported by the total lack of RAs in Japanese; in this language, direct modifiers are formed not by an adjectival suffix but by a nominal Case morpheme, as mentioned in section 1. If RAs were lexemic word-formations, their preponderance in European languages in contrast to their total absence in Japanese would remain a puzzle. However, if RAs are word-forms, their presence and absence in a language are a matter of morphological typology. Because different languages use different morphological realization patterns for common grammatical functions, it is plausible that Japanese morphologically realizes the adjunct PP base structure (19) in a distinct way from English and other RA languages. Below, we will show that the choice of the *no* forms (instead of RA forms) for the realization of direct modifiers is closely related to the morphology of Japanese adjectives.

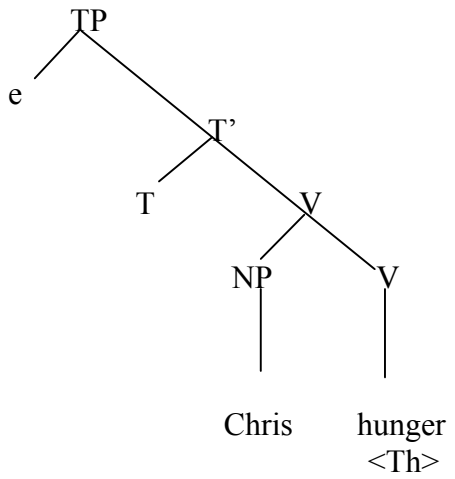
3.1. Morphology of Japanese adjectives in predication and its correlation to indirect vs. direct modification

The syntactic category of A is well known for exhibiting a typological partition into two morphological types in the predicative function: verb-like adjectives and non-verb-like adjectives in Dixon's (2004) terms (see also Stassen 1997, 2009: 140-141). Verb-like adjectives behave like intransitive verbs in allowing the predicative use by themselves, without a copular verb. Non-verb-like adjectives, on the other hand, behave like predicate nominals in needing an independent copula to occur in the predicative function. In Baker's (2003) theory of lexical categories, this typological difference can be described as a difference of the realization pattern of the function Pred (Bowers 1993). In this theory, verbs can take a subject and thus function as predicates by themselves, while adjectives and nouns cannot take a subject and hence need the support of Pred to introduce a subject and function as predicates (see Baker 2003: chapter 2). Thus, the verbal predication in (31a) is given a structure like (32a), whereas the non-verbal (adjectival and nominal) predication in (31b,c) is given a structure like (32b). Crucially, the structures in (32a,b) show Baker's view that the category V is equivalent to the composite category Pred+A(P); verbs realize Pred and A in one-word forms. English canonical adjectives, on the other hand, need the copular verb *be* (or copulas such as *as* in small clauses) as a morphological bearer of Pred. As indicated in (31b,c), they cannot morphologically realize Pred in and of themselves, just as nouns cannot ((31) and (32) from Baker 2003: 35).

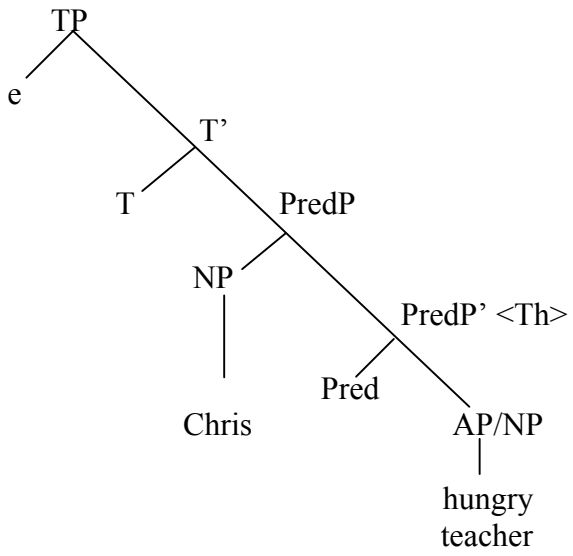
(31)
a. Chris hungers.
b. Chris *(is) hungry.
c. Chris *(is) a teacher.

(32)

a.



b.



If English canonical adjectives, which belong to the "non-verb-like" type, correspond to A(P) in (32b), then, verb-like adjectives should be morphological realizations of the composite category Pred+A; in this case, Pred in (32b) is fusionally realized on the lexical category A. What is crucial here is the fact that Japanese canonical adjectives, which characteristically have the non-past *-i* ending, belong to the latter type. As indicated below, they can take a subject like verbs and do not need the copular verb *de-aru* or its contracted form *da*.

(33) Canonical adjectives

a. yama-ga takai
mountain-NOM high.PRES
'The mountain is high.'

b. yama-ga takakatta
mountain-NOM high.PAST
'The mountain was high.'
(Nishiyama 1999: 183)

(34) Intransitive verbs

a. John-ga karuk-u warau
John-NOM light-ADV laugh.PRES
'John laughs lightly.'

b. John-ga karuk-u waratta
John-NOM light-ADV laugh.PAST
'John laughed lightly.'

If the structure in (32b) underlies the adjectival predication in (33), the adjectives within should correspond to the composite category Pred+A, hence their parallelism to the intransitive verbs in (34). In fact, Nishiyama (1999, 2005) confirms the Pred status of the root-final morpheme *k* of canonical adjectives, which manifests itself overtly in all of their inflectional forms except the present-tense form (33a); as underscored, *k* occurs in the past form in (33b) and also in the predicative-adverb forms in (34a, b). In the Fukuoka dialect, the Pred morpheme *k* appears in all the word forms including the present-tense form:[15]

(35) Canonical adjectives in the Fukuoka dialect

a. yama-ga takaka
mountain-NOM high.PRES
'The mountain is high.'

b. yama-ga takakatta
mountain-NOM high.PAST
'The mountain was high.'

[15] The Fukuoka dialect is spoken in northern parts of the Kyushu region in Japan. One of the present authors is a native speaker of this dialect.

In brief, Japanese canonical adjectives morphologically differ from English canonical adjectives in realizing not only A but also Pred.

Furthermore, as discussed by Kageyama (1993), the predicative copula (Pred copula) *de* (Nishiyama 1999) exhibits distinct morphological properties in so-called nominal adjectives (36) and predicate nominals (37).

(36) Nominal adjectives

a. hon-ga kiree-de-aru
book-NOM pretty-PRED-PRES
'The book is pretty.'

b. hon-ga kiree-de-atta
book-NOM pretty-PRED-PAST
'The book was pretty.'

(37) Predicate nominal

a. John-ga sensee-de-aru
John-NOM teacher-PRED-PRES
'John is a teacher.'

b. John-ga sensee-de-atta
John-NOM teacher-PRED-PAST
'John was a teacher.'

At the first sight, nominal adjectives look like English canonical adjectives, exhibiting the same syntagmatic pattern as nouns. Yet, Kageyama (1993) and Shimada (2004: chapter 5) argue that the Pred copula *de* constitutes an inflectional ending with respect to its lexical host in (36) but does not in (37). As the following data indicates, *kiree-de* in (36) exhibits lexical integrity while *sensee-de* in (37) does not:

(38)

a. hon-ga kiree *(de) tana-ga gooka-de-aru
book-NOM pretty-(PRED) shelf-NOM gorgeous-PRED-PRES
'The book is pretty and the shelf is gorgeous.'

b. John-ga sensee (de) Tom-ga seito-de-aru
John-NOM teacher-(PRED) Tom-NOM student-PRED-PRES
'John is a teacher and Tom is a student.'

Significantly, independent evidence shows that nominal adjectives form a natural class with canonical adjectives rather than with predicate nominals. For example, Nishiyama (1999: section 1) points out the contrastive possibilities of the abstract noun deriving *sa*-suffixation and the *soo* ('seem') complementation between canonical and nominal adjectives on one hand and predicate nominals on the other. As a stronger piece of evidence for the categorial identity between canonical and nominal adjectives, the Fukuoka dialect uses not *de* but *k* for the realization of Pred in nominal adjectives:

(39) Nominal Adjectives in the Fukuoka dialect

a. hon-ga kiree-k-a
book-NOM pretty-PRED-PRES
'The book is pretty.'

b. hon-ga kiree-k-atta
book-NOM pretty-PRED-PAST
'The book was pretty.'

Thus, given the categorial identity of canonical and nominal adjectives,[16] it seems to be safe to conclude that Japanese adjectives morphologically conflate A and Pred.

[16] See also Baker (2003: section 4.6.1) for arguments against the view that Japanese has two kinds of adjectives (e.g. Backhouse 2004).

Now turning to nominal modification, we propose that the morphological property of Japanese adjectives discussed above is closely related to the long-standing observation that direct modification is difficult with Japanese adjectives. First, Sproat and Shih (1988, 1991), Morita (2010), and Watanabe (2012) show that they do not follow the ordering restriction in (11) in modifying nouns. As the data below show, canonical adjectives, which modify a noun in the same form as their present-tense *i*-ending form (see (33a)), and nominal adjectives, which take the *na* ending instead of *de* (see (36a,b)) in nominal modification, occur in a free syntactic order irrespective of their semantic classes. Compare the adjectival ordering in (40a, b) with the one in the English translation (Sproat and Shih 1991:582):

(40)

a. chiisana shikakui ie
small square house
'small square house'

b. shikakui chiisana ie
square small house
'small square house'

Next, Hoshi (2002: section 6.1) points out that Japanese adjectives lack the semantic ambiguity that English adjectives can exhibit in nominal modification. Thus, the ambiguity of *a beautiful dancer* discussed in (7a) does not obtain in the Japanese translation; the Japanese translation of this phrase can be interpreted only intersectively (Hoshi 2002: 15):

(41) Kanozyo-wa utsukushi-i dansaa-da
she-TOP beautiful dancer be
'She is a dancer who is beautiful.'
= someone who is beautiful and who is a dancer (= intersective)
= ?*someone who dances beautifully and who is a dancer (= non-intersective)

According to Hoshi, the not-completely-unacceptable status of the non-intersective interpretation comes from the independent fact that Japanese allows for zero pronominals.[17]

Thirdly, Morita (2010) shows that both canonical and nominal adjectives are gradable adjectives. They accept modification by degree adverbs such as *motto* 'more,' *totemo* 'very,' and *kanari* 'fairly,' which is shown for canonical adjectives by her data in (42) and for nominal adjectives by her data in (43). Notice that Morita explicitly indicates the existence of the *k* morpheme in the canonical adjective modifiers in (42). Also, these data show that the non-gradable modifiers, which cannot be modified by the degree adverbs, all take the *no*-ending form (Morita 2010: 110-111):[18]

---

[17] Thus, according to Hoshi (2002: 16-17), the modifier in (41) has the following relative-clause structure with the zero pronominal:

(i) Kanozyo-wa [*e* utsukushi-i] dansaa-da
she-TOP beautiful dancer-PRED

In his view, the very subtle ambiguity arises because the zero pronominal can be interpreted as the counterpart of either of the two overt relative subjects in (iia, b).

(ii)

a. Kanozyo-wa [yooshi-ga utsukushi-i] dansaa-da.
she-TOP figure-NOM beautiful dancer-PRED
= someone whose figure is beautiful and is a dancer

b. Kanozyo-wa [odori-ga utsukushi-i] dansaa-da.
she-TOP dance-NOM beautiful dancer-pred
= someone whose dance is beautiful and is a dancer

[18] The QA status of the *na* form is clearly shown by toponymic modification:

(42)
a. totemo {maru(k)-i/*maru-no} teeburu
very round round table
'a very round table'
b. totemo {shikaku(k)-i /*shikaku-no} teeburu
very square square table
'a very square table'

(43)
a. motto {wazuka-na / *wazuka-no} okane
more a little-NA a little-NO money
'lesser amount of money'
b. kanari {koosiki-na / *kooshiki-no} kaigi
fairly formal-NA formal-NO conference
'a fairly formal conference'

Based on these facts, we assume that Japanese adjectives (both canonical and nominal adjectives) modify nouns as indirect modifiers (i.e. relative clauses), adjoined to the DP-internal domain above the small d head in (14). We claim that this syntactic restriction to indirect modification is a consequence of these adjectives morphologically conflating Pred, for the direct Merge between A(P) and N(P) without the mediation of Pred is the very definition of direct modification (see section 2.1). One might worry about the *de-na* ending alternation exhibited by nominal adjectives. The allomorphic relationship between *de* and *na*, i.e. the fact that *na* is an allomorph of the Pred copula *de*, is confirmed by the inflection of nominal adjectives in the Fukuoka dialect. As shown below, nominal adjectives take *k* for Pred not only in predication but also in modification (see also (39) for predication):

(44) Modification and predication by nominal adjective in the Fukuoka dialect
a. kiree-k-a hon
pretty-PRED-PRES book
'a pretty book'
b. hon-ga kiree-k-a
book-NOM pretty-PRED-PRES
'The book is pretty.'

On the other hand, direct modifiers, i.e. modifiers that are directly merged with the head noun in the DP-internal domain below the small d head, take the *no* ending, as indicated by (1), (2), (42), and (43). Thus, our hypothesis about nominal modification in Japanese is that canonical and nominal adjectives are always indirect modifiers, while direct modifiers always take the

---

(i)
a. Tsukuba-na omise
Tsukuba-NA shop
'a shop that reminds one of Tsukuba'
b. Tsukuba-no omise
Tsukuba-NO shop
'a shop in Tsukuba'

Based on the toponym *Tsukuba*, the name of the largest academic town in Japan, the modifier in (ia) denotes properties characteristic of people in academia and their ways of living (e.g. "practical", "not fashionable", "economical", "geeky"); hence, it can be modified by a degree adverb. The shop in (ia) does not have to be in Tsukuba. In contrast, the *no*-modifier in (ib) denotes a location, so that the shop in (ib) has to be in Tsukuba. Incidentally, the modifier in (ia) can be augmented by the suffix *-teki* (e.g. *Tsukuba-teki-na omise*), expressing the same meanings. This is a piece of evidence on which we argue against Bisetto's (2010) analysis of *-teki* as an RA suffix.

no form.[19]This is in line with Morita's (2011) morphology-based analysis of nominal modifiers in Japanese. In the next section, we will confirm the proposed formal property of Japanese direct modifiers by looking at how the direct modifiers in English, both canonical adjectives and RAs, are translated into Japanese; what we will see presently is the use of *no* modifiers (and modificational compounds) rather than canonical and nominal adjectives.

3.2. Comparison to English direct modifiers

Let us start with the translation data of English attributive-only adjectives:

(45)

a.	an alleged miracle	a'	mayutsuba(-mono)-no kiseki fake(-thing)-NO miracle
b.	a fake pistol	b'	nise(-mono)-no pisutoru fake(-thing)-NO pistol
c.	a total stranger	c'	aka-no tanin red-NO stranger
d.	the mere child	d'	hon-no kodomo mere-NO child
e.	the sole/only survivor	e'	yuiitsu-no seozonsha sole-NO survivor
f.	sheer delight	f'	mattaku-no yorokobi complete-NO delight
g.	a junior/senior bureaucrat	g'	kakyuu-no/jyookyuu-no yakunin junior-NO/senior-NO bureaucrat
h.	a stricken deer	h'	teoi-no shika wounded-NO deer
i.	a drunken brawl	i'	sake-no ue-no kenka alcohol-no over-NO brawl

In these data, attributive-only or unambiguously direct-modifier adjectives in English are translated into Japanese by *no*-form modifiers. In some cases, not only the *no*-form modification but also modificational compounding can be employed. In the following pairs, the second translation exhibit the one-word form [bound modifier + free or bound nominal].

(46)

a.	the uppermost floor	a'	ichiban ue-no kai / saijoo-kai most above-NO floor uppermost-floor
b.	the former mayor one time-NO mayor	b'	mae-no sichoo / zen-sichoo former-mayor

[19] We do not go into the details of the remaining possibility, i.e. the *no* form used for indirect modification, as in the following example (Shimada 2004: 124):

(i) [gakusei-ga asu fuzai-no] kenkyuushitsu
student-NOM tomorrow absent-NO laboratory
'a lab from which students will be absent tomorrow'

For the non-predicative use of canonical and nominal adjectives such as the one in (ii) below, see section 3.2 and Hoshi (2002: section 5):

(ii) furui yuujin
old friend
'an old friend'

c. late Prof. Smith

c' onakunari-no sumisu kyoojyu /
deceased-NO Smith professor
ko-sumisu kyoojyu
deceased-Smith professor

It is very difficult to find Japanese adjectives that could replace the modifier forms in (45a'-i') and (46a'-c').

Next, cases of ambiguous adjectival modification in English, such as (7a, b), are formally disambiguated in Japanese via the distinction between adjectival modifiers and *no*-modifiers. In (41), we saw that the ambiguity of *a beautiful dancer* does not obtain in the Japanese adjectival translation form. Similarly, when we translate the English ambiguous phrases in (47a, b) by adjectival modifiers, as in (47a') and (47b'), their non-intersective readings disappear. In contrast, if we use *no*-modifiers as in (47a'') and (47b''), only those readings remain. The Japanese NP in (47a''), for example, refers to a dog which is characterized by a small dog-size, i.e. a small-size dog.

(47)

a. *a small dog*

a' chiisai inu
small dog

a'' ko-gata-no inu
small-size-NO dog

b. *a safe driver*

b' anzen-na/buji-na untenshu
safe driver

b'' anzen-daiichi-no untenshu
safety-first-NO driver

The ambiguity of the adjective *old* (e.g. (7b)) is also formally disambiguated:

(48)

a. *an old friend*

a' nenpai-no/ toshiyori-no yuujin
aged-NO friend

a'' furui yuujin / furuku-kara-no yuujin
old friend/ old.time-from-NO friend

b. *old wine*

b' furui wain
old wine

b'' nendai-mono-no wain
age-thing-NO wine

c. *(Britain's) old families*

c'

c'' (igirisu-no) kyuuka /furuku-kara-no kakei
Britin-gen old.family/old.time-from-NO family

Notably, (48a'') indicates that not only *no*-forms but also adjectival forms can be used for the non-intersective readings of (48a). Yamakido (2000) claims that the adjectival modification *furui yuujin* 'an old friend' in (48a'') constitutes a strong piece of evidence against the traditional (and also our) view that Japanese adjectives are barred from direct modification. Although we do not go into the question of why *furui* can be exceptionally used in the direct modification, we need to notice that the Japanese adjective *furui* 'old' is antonymous to *atarashii* 'new' but not to *wakai* 'young,' so that the predicative sentence **Kono yuujin-wa furui* 'This friend is old' is totally out. In other words, the AP + NP in (48a'') is not ambiguous like the English counterpart in (48a); the 'not young' sense of *old* corresponds to the *no*-forms *nenpai-no* and *toshiyori-no* 'aged,' as shown in (48a'). When the head noun brings forth the 'not new' sense of *old*, as in (48b), the intersective reading is translated by the adjectival form, as in (48b'), and the non-intersective reading by the *no*-form, as in (48b''). When the English *old* phrase is unambiguously a direct modification, as in (48c), we do not have adjectival translation, so (48c') is left open. In a nutshell, the data in (48) also show that

Japanese adjectives differ from English adjectives in formally disambiguating direct and indirect modification.

Finally, section 2.2 showed that RAs in English are direct modifiers. Using data such as (1), cited again as (49) below, Watanabe (2012) shows that material and nationality RAs correspond to *no*-modifiers in Japanese:

(49)

a.	wheaten bread	a’	komugi-no pan wheat-NO bread ‘wheaten bread’
b.	Chinese {vase / cooking}	b’	chuugoku-no {kabin / ryoori} China-NO {vase / cooking} ‘Chinese vase/cooking’

The following translation pairs in (50) show that the correspondence is not limited to material and nationality. RAs of shape (50a), weather (50b), body part (50c), location (50d-g), time (50h), and status (50i,j) also correspond to *no*-modifiers.

(50)

a.	triangular room	a’	sankaku-no heya triangle-NO room
b.	rainy season	b’	ame-no kisetsu rain-NO season
c.	bearded man (cf. 25e)	c’	hige-no otoko beard-NO man
d.	marine life	d’	umi-no {seikatsu / seibutsu} sea-NO {living state / living thing}
e.	local wine	e’	jimoto-no wain home-NO wine
f.	the dream of global peace	f’	sekai(-no) heiwa-no yume world(-NO) peace-NO dream
g.	prenominal adjectives (cf. 26a)	g’	{meisi(-no) mae-no/ meishizen-i-no} keiyooshi noun(-gen) front-NO/ noun-front-NO adjective
h.	pre-Chaucerian literature (cf. 26a)	h’	choosaa izen-no bungaku Chauser before-NO literature
i.	vice-presidential caliber	i’	fuku-daitooryoo-no utsuwa vice-president-NO caliber
j.	her presidential term	j’	kanojyo-no daitooryoo-no ninki her-gen president-NO term

Let us check the direct-modifier status of these *no*-modifiers, starting with the syntactic ordering restriction. Watanabe (2012) confirms the direct modifier status of material and nationality no-modifiers like (49a’,b’) by their relative ordering to adjectival modifiers. Compare the following data with the free ordering of multiple-adjectival modification in (40) (Watanabe 2012: 507):

(51)

a.	chiisana ki-no hashi small wood-GEN bridge ‘small wooden bridge’	a’	??ki-no chiisana hashi wood- GEN small bridge

b. chiisana chuugoku-no kabin
small China-GEN vase
'small Chinese vase'

b' ??chuugoku-no chiisana kabin
China-GEN small vase

Most of the Japanese phrases in (45), (46), and (50) do not allow the insertion of an adjective or a Possessor-denoting genitive noun between the *no*-modifiers and the head nouns, as follows:

(52)

a. chiisana nise-no pisutoru
small fake-NO pistol

a' ??nise-no chiisana pisutoru (cf. 45b')
fake-NO small pistol

b. takai jimoto-no wain
expensive home-NO wine

b' ??jimoto-no takai wain (cf. 50e')
home-NO expensive wine

However, we notice that when the host of *no* is headed by a semi-lexical, relational noun, with the complex internal structure [modifier/complement+relational noun], the *no*-modifier allows for the intrusion of an adjectival modifier:

(53)

a. kuroi nise-mono-no pisutoru
black fake-thing-NO pistol
'a black fake pistol'

a' nise-mono-no kuroi pisutoru (cf. 45b')
fake-thing-NO black pistol

b. idaina furuku-kara-no kakei
great old.time-from-NO family
'a great old family'

b' furuku-kara-no idaina kakei (cf. 48c'')
old.time-from-NO great family

c. marui nendai-mono-no chiizu
round age-thing-NO cheese
'round old cheese'

c' nendai-mono-no marui chiizu (cf. 48b'')
age-thing-NO round cheese

The *no*-modifiers in these examples differ from those in (51) and (52) in their internal morphosyntactic complexity; the hosts of *no* in (51) and (52) are purely lexemic nouns, while *no* in (53) attaches to multi-word complexes headed by semi-lexical relational nouns. The contrast between (52a) and (53a) makes this point clear; as we saw in (45b'), the adjective *fake* corresponds to the *no*-modifiers with and without the light noun *mono* 'thing,' *nise-mono-no* and *nise-no*. The latter form observes the ordering restriction, but the former form does not. Below, we will use the term "complex *no*-modifier" to refer to *no*-modifiers based on the headed internal structure [lexeme+overt relational noun].[20]

Curiously, *no*-modifiers of this type differ from the simple type in allowing the predicative use:

(54)

a. kono pisutoru-wa nise-mono-da
This pistol-TOP fake-thing-PRED
'This pistol is a fake one.'

b. *kono pisutoru-wa nise-da.
this pistol-TOP fake-PRED
'This pistol is a fake one.'

[20] This type excludes *no*-modifier whose hosts are morphologically complex lexemes formed by bound elements, such as *komugi-no* in (49a) and *chuugoku-no* in (49b).

We need to hasten to add, however, that from the viewpoints of semantics and degree modification, the *no*-modifiers observed in this section, whether complex or simplex, qualify as direct modifiers.[21] Semantically, they name specific subtypes of the kinds denoted by the modifiee nouns. For example, the formal difference between the modifiers in (47a') and (47a'') clearly corresponds to the semantic distinction between referent vs. reference modification although both of the modifiers can occur in the predicative usage:

(55)
a. kono inu-wa chiisai. (cf. 47a')
this dog-TOP small-PRES
'This dog is small.'
b. kono inu-wa kogatada. (cf. 47a'')
this dog-TOP small-size-PRED.PRES
'This dog is a small-size dog.'

The direct-modifier status of the no-modifier with RN *kogata-no* is also suggested by the fact that unlike the canonical adjective *chiisai* (or the nominal adjective *chiisana*), it cannot be modified by a degree adverb:

(56)
a. motto chiisa-na/-i inu
more small dog
'a smaller dog'
b. *motto kogata-no inu
more small-size-NO dog

For the gradability difference between adjectives and *no*-modifiers, see also the data in (42) and (43).

Although we have no explanation for the ordering property of the complex *no*-modifiers in (53), their predicative usage (54a) can be seen as a kind-specifying type of predication discussed by McNally and Boleda (2004). According to these authors, RAs in European languages are kind-specifying adjectives, and as long as this interpretation is explicit, with the subject denoting a kind rather than an ordinary individual, RAs can be used predicatively. They provide the following Catalan example (McNally and Boleda 2004: 189):

(57) La tuberculosi pot ser pulmonar.
'Tuberculosis can be pulmonary.'

The predicative usage of RAs is restricted because they select kind-denoting subjects, as predicates such as *be extinct* and *exist* (e.g., *This kind of dog is extinct.*/**Fido is extinct.*). Based on this finding about RAs, we tentatively propose that the complex *no*-modifiers allow for the predicative usage, as in (54a) and (55b), because the overt relational noun guarantees the kind-specification interpretation.[22]

[21] The complex modifier *furuku-kara-no* in (48a'') and (48c''), however, allows for degree modification.

[22] In Japanese linguistics, the kind-specifying predication is called property-description and distinguished from the event-description type of predication (Kageyama 2006, 2009). Significantly, the syntactic frames for property description utilize the same semi-lexical relational nouns as we observe in the complex *no*-modifiers. Witness the use of the light noun *mono* (and the pronoun *no*) in the following sentence:
(i) Inu toiu-{**no**/**mono**}-wa kamu **mono**-da

In sum, this section has shown that direct modifiers in English consistently correspond to *no*-modifiers in Japanese. Formally, the *no*-modifiers come in simplex and complex types, depending on whether the host of *no* has a semi-lexical relational noun or not. They qualify as direct modifiers in light of their kind-specifying semantics, lack of gradability, syntactic closeness to the head noun, and potential to participate in kind-denoting predication, with the last two properties showing a variation between the two formal types.

3.3. The *no*-modifier as the incorporated form of the adjunct PP structure

In section 2.2, we argued that the adjunct base structure in (19) is morphologically realized as PPs and/or NPs with semantic Case affixes in indirect modification but as RAs in direct modification. Specifically, RAs are morphological realizations of the representation in (23). RA languages, including English, have the morphological resources for this option, i.e. A-deriving affixes, to spell out (23) because their non-derived adjectives belong to the non-verb-like type discussed in section 3.1; they do not morphologically conflate Pred. Our present assumption, which is tacitly assumed in the literature, is that word-formation and inflection in a language cannot produce lexemes or word-forms of the type absent from its non-derived basic vocabulary. To put it simply, English can produce adjectives that does not conflate Pred (i.e. RAs) because their canonical adjectives do not conflate Pred.

Under the same assumption, if Japanese canonical adjectives always conflate Pred (section 3.1), this language should not have morphological resources that give rise to adjectives that do not conflate Pred. In our view, this is why Japanese totally lacks RAs (or morphological affixes that realize (23) as RAs); and it is also the reason why Japanese opts for the incorporation path in (24), cited below again as (58), to produce direct modifiers.

(58) Incorporation in (19) leads to:
a. [P [Noun]] e.g. (49a') *komugi-no* (*pan*)
b. [P [RN-Noun]] e.g. (47a'') *ko-gata-no* (*inu*)

It is clear that the simple *no*-modifier corresponds to (58a) while the complex *no*-modifier to (58b), with *no* being the exponent of P, the adjunct-introducing category. To use the base structure in (19), *no* realizes a primary function while relational nouns (e.g. *kata* 'size') realize a secondary function; and Noun and RN are incorporated into the functional head P.

One may notice that the relational nouns of the complex *no*-modifiers we have seen in section 3.2 do not necessarily combine with a noun as suggested by the inner bracket of (58b); the *no*-modifier in (47a''), for example, has the internal structure [[[ko]$_{\text{A stem}}$+[kata] $_{\text{RN}}$]no]. A similar observation holds true of some of the English direct modifiers in (30) (e.g. *a middle-size bank*). First, although we cannot go into details, we assume that the complement of the Rn head in (19) is an instance of Rheme (Ramchand 2008) and hence its syntactic category is not limited to NP or DP (see Ramchand 2008: chapter 2).[23]

Second, we do have a number of examples in which the complex *no*-modifier has a nominal complement, exhibiting the exact manifestation of the internal structure in (58b). In fact, as mentioned in section 1 (see (3)), simple *no*-modifiers with the internal structure in (58a) can be expanded by the insertion of a relational noun, which yields complex *no*-modifiers with the internal structure in (58b). For example, the simple *no*-modifiers in (49) and (50) can be turned into the complex type by relational nouns that specify the semantic relationship between the modifier noun and the modified noun:

Dog called-thing-TOP bite thing-PRED
'Dogs bite.'

[23] See also Adger (2013) for the syntactic status of the complement of relational nouns.

(59)

a. Chuugoku-{siki/ fuu}-no ryoori (cf. 49b')
China-{style/ type}-NO cooking
'Chinese-style cooking/ Chinese-type cooking'

b. komugi-{sei/iro}-no pan (cf. 49a')
wheat-{made/ color}-NO bread
'wheat-made bread/ wheat-color bread'

c. sankaku-kei-no heya (cf. 50a')
triangle-form-NO room
'a triangular-form room'

d. kai-{chuu/joo}-no seikatu (cf. 50d')
sea-{in/on}-NO living state
'life inside the sea/ life on (or above) the sea'

e. jimoto-san-no biiru (cf. 50e')
home-grown-NO beer
'locally brewed beer'

f. sekai-kibo-no heiwa-no yume (cf. 50f')
world-scale-NO peace-NO dream
'the dream of world-wide peace'

g. fuku-daitooryoo-toshite-no utsuwa (cf. 50i')
vice-president-as-NO caliber
'(one's) caliber as a vice-president'

h. kanojyo-no daitooryoo-toshite-no ninki (cf. 50j')
her-gen president-as-NO term
'her term as a president'

As these data suggest, Japanese is rich in relational nouns that can be used for the secondary function realization, i.e. the Rn head in (19). Witness the following non-exhaustive list of the Rn formatives:

(60) Representative RNs used in the *no*-modifier:

a. **Material**: *sei* 'made by,' *iri* 'added'
b. **Origin**: *sei* 'made in,' *kei* 'descended from,' *shussin* 'coming from,' *umare* 'born in'
c. **Shape/Size**: *kei* 'shape,' *kata/gata* 'shape, size'
d. **Taste**: *aji*/ *mi* 'taste,' *fuumi* 'taste'
e. **Type**: *sei* 'type, nature,' *gata* 'type,' *kei* 'type'
f. **State**: *joo* 'state,' *jootai* 'state,' *sugata* 'wearing'
g. **Belonging**: *kumi* 'group,' *ha* 'group, school,' *shugi* 'ism,' *syozoku* 'belonging to'
h. **Similarity**: *fuu* 'like,' *ryuu* 'like, in the style of'
i. **Possession/Ingredient**: *tsuki* 'with,' *mochi* 'with,' *iri* 'added'
j. **Purpose/Target**: *yoo* 'for,' *muke* 'meant for,' *senyoo* 'exclusively for'
k. **Location**: *mae*/ *zen* 'front,' *shita/ ka* 'under,' *naka* 'in, inside,' *ue/ joo* 'on, above,' *chuu* 'inside,' *kan* 'between,' *iki* 'bound for,' *hatsu* 'departing from,' *muki* 'toward, faced to,' *kake* 'hanged on'[24]
l. **Time**: *mae* 'before,' *go* 'after,' *chuu* 'during'
m. **Status/Profession**: *jin* 'nationality,' *shi* 'specialist,' *fu* 'female,' *kan* 'official,' *ko* 'worker,' jo 'female,' *toshite* 'as'
n. **Level**: *kyuu* 'level,' *reberu* 'level,' *do* 'degree,' *i* 'level'

[24] This class of Rn formatives are discussed under the term Axial Part in Svenonius (2006, 2010).

The semi-lexical nature of the formatives in (60) is indicated by their morphological boundness; most of them need a host to attach to.

Our analysis of *no*-modifiers as word-forms based on the base structure (19) is confirmed by the fact that inalienable possession nominals and simple event nominals can be used as the Rn formatives (Shimada 2004: chapter 5). Ogawa (2001) observes that relational nouns constitute a natural class with inalienable possession nouns and simple event nominals in morphosyntactic contexts independent of direct modification. (61) exemplifies inalienable possession nominals realizing secondary functions, while (62) exemplifies the realization by simple event nominals (see also Yumoto 2009 for the latter type):

(61)
a. choo-hatsu-no gakusei
long-hair-NO student
'a long-haired student'
b. chika-ba-no hoteru
near-place-NO hotel
'a nearby hotel'

(62)
a. ishi-zukuri-no ie
stone-make-NO house
'a stone-made house'
b. kata-yude-no tamago
hard-boil-NO egg
'a hard-boiled egg'

Crucially, the nominalizations used in (62a, b), V-to-N conversions (e.g. *tsukuru* 'to make' > *tsukuri* '(a) make, making,' *yuderu* 'to boil' > *yude* '(a) boil, boiling'), belong to the simple event nominalization (Sugioka 2011; see also Tagawa 2013 for this type of nominalization).

Lastly, let us close this section by presenting evidence for the process of incorporation itself. First, all the complex *no*-modifiers have indirect-modifier counterparts; similarly to the correspondences in (25) and (26), the base adjunct structure in (19) has phrasal and morphological realizations, as follows:

(63)

a.	sankaku-kei-no heya triangle-form-NO room 'a triangular room'	(cf. 59c)	a'	sankaku-no katachi-no heya triangle-NO form-NO room 'a room of a triangular form'
b.	choo-hatsu-no gakusei long-hair-NO student 'a long-haired student'	(cf. 61a)	b'	nagai kami-no gakusei long hair-NO student 'a student with long hair'
c.	ishi-zukuri-no ie stone-make-NO house 'a stone-made house'	(cf. 62a)	c'	ishi-no tsukuri-no ie stone-NO make-NO house 'a house made of stone'

The direct modifiers in (63a-c) are formed by incorporating the complement and the relational noun in (63a'-c') successively into the uppermost *no*. Notice that this process is accompanied by morphophonological alternation (i.e. allomorphic alternation) of the incorporated elements; for example, in (63a/a'), the free Rn formative *katachi* alternates with its bound form *kei*, while in (63b/b'), the complement adjective *nagai* alternates with its suppletive

bound form *choo*. The free-bound allomorphy occurs due to the XP vs. X^0 difference between indirect and direct modifiers (section 2.2), so that similar changes can be observed in English pairs of direct and indirect modifiers as well (see (26)).

Next, *no*-modifiers exhibit general properties of the incorporating patterns (Dahl 2004: chapter 10; see also Baker 2003: section 4.6.3). We have already seen that *no*-modifiers denote permanent, classificatory properties and that the incorporated complement and relational noun form a single morphological word occurring in their bound forms. Additionally, the incorporated nominal complements cannot take a D element, cannot be modified by an indirect modifier,[25] or cannot take the plural marker *-tachi*, as the following data for simple *no*-modifiers (64) and complex *no*-modifiers (65) indicate:

(64)
a. kono ki-no tsukue
this wood-NO desk
'this wooden desk,' # 'a desk made of this wood'
b. *oji-no-sumu Chuugoku-no kabin
uncle-Nom-live China-NO vase
'a vase made in China, where my uncle lives'
c. {kodomo/*kodomotachi}-no hon
{child/*children}-NO book
In the sense 'a children's book'

(65)
a. ookii ichigo-iri-no keeki
large strawberry-RN ('added')-NO cake
#? 'cake with large strawberries,' 'strawberry cake which is large'
b. genkina ko-mochi-no otokotachi
high-spirited child-RN ('with')-NO men
'men with a high-spirited child or children,'
'high-spirited men with a child or children'
c. {kodomo/*kodomotachi}-yoo-no hon
{child/*children}-RN ('for')-NO book
'a book written for children'

4. Concluding remarks

This paper has shown that RAs in English are a type of direct modifiers and their syntactic, morphological, and semantic properties can be better understood in light of the distinction of two types of nominal modification: direct and indirect modification. Specifically, adopting the

[25] The possibility of expanding the incorporated nominal complement by direct modifiers cannot be addressed in this paper (see Nikolaeva and Spencer (n.d.)). For example, comparison between (65a,b) with the following data speaks for the expansion possibility:
(i)
a' ko-gata-no ichigo-iri-no keeki
small-size(-NO) strawberry-RN('added')-NO cake
'cake with small strawberries', 'strawberry cake which is small'
b' sannin-no ko-mochi-no otokotachi
three-RN ('person')-NO child-RN ('with')-NO men
'men with three children', 'three men with a child or children'
This fact might raise certain complications for our assumption that (63 a'-c') represent indirect modification. We leave this issue for further research.

separation hypothesis, we have proposed that the base adjunct structure is realized as PPs in indirect modification while as RAs in direct modification. In the sense that this formal alternation is forced by syntactic contexts of modifiers, RA formation is closer to inflection than to lexeme formation.

Our separationist approach to RAs in English has been supported by the fact that Japanese uses a distinct form, the incorporated PP form, to realize the same base structure in direct modification. Japanese opts for this path of realization because RA forms, or adjectives without Pred, run afoul of the morphological typology of non-derived canonical adjectives in this language.

What we have seen in this paper is a cross-linguistic competition of two morphological realizational processes: incorporation and affixation. For the realization of PP-based direct modifiers, English opts for affixation while Japanese opts for incorporation. Because this option is crucially dependent on the grammar of each particular language, it is quite natural that the realizational competition is observed within one language. Notably, Rainer's (2013) data, (5a,b) in particular, indicate that Spanish uses both affixation and incorporation for PP-based direct modifiers; in some cases, this language uses (23) like English to yield RAs, but in other cases, it uses (24) like Japanese to give rise to the N+P+N direct modification.[26] Why does Spanish differ from English and Japanese in the availability of the two realization processes? If our analysis is on the right track, the answer to this question should be sought in morphosyntax, and we tentatively suggest that one factor comes from word-order properties of direct modification. Specifically, Spanish differs from English and Japanese in the flexibility of the order between direct modifiers and modified nouns. As we saw in (10a, b), direct modifiers in Romance languages occur both prenominally and postnominally, while direct modifiers in English occur only prenominally. In Japanese, both indirect and direct modifiers occur only prenominally. Although both RAs (5a) and incorporated PPs (5b) occur postnominally in Spanish, word order is one of the defining syntactic properties of direct modification and therefore, its variation is worth exploring as a possible factor underlying the morphological variation between the languages at issue. Finally, as for the question of how Spanish distribute the two realization processes in each instance of PP-based direct modification, a very careful scrutiny of various aspects of Spanish grammar is the central task.[27]

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[26] See Moyna (2011: chapter 1) for the incorporation analysis of the N+P+N construction in Spanish. Also, Fradin (2009) and Masini (2009) for parallel modification constructions in French and Italian, respectively.

[27] One can find an in-depth exercise along this line in Feist (2012) for direct modification in English.

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