

A structure-based approach to the predicativity of relational adjectives derived from combining forms

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Abstract: It has been observed that relational adjectives (hereafter, RAdjs) are attributive only (Shimada and Nagano, 2018; cf. Bally, 1944; Beard, 1995; Levi, 1978). However, they can be used predicatively in certain semantico-syntactic contexts of contrast (Levi, 1978; McNally and Bolenda, 2004). Moreover, as observed by Shimada and Nagano (2018), it can explain that the phenomenon is a result of a deletion of modified noun in terms of construction. On this basis, this paper first reviews what kinds of conditions is necessary to delete modified noun from Levi (1978). We then observe the deletion process to apply to Adger’s (2013) analysis of relational nouns. Finally, we indicate that some RAdjs derived from combining forms can be appear in the predicate position without semantico-syntactic contexts of contrast.

Keywords: denominal adjective; predicativity; N-deletion; functional head \bar{p} ; combining forms

1. Introduction

This paper addresses the question of why relational adjectives (hereafter, RAdjs) derived from combining forms (hereafter, CFs) behave differently from other types of RAdjs when used in the predicate position. It has been observed that RAdjs are attributive only (e.g. nuclear electricity, industrial output) but they can be used predicatively in certain semantico-syntactic contexts of contrast (Levi, 1978). For example, nuclear, a RAdj derived from the noun nucleus, occurs in the predicate position in (1a), where the subject is quantified by 75%, resulting in “a clear sense of contrast between nuclear electricity and other types of electricity that should account for the remaining 25%” (Shimada and Nagano. 2018, p.65).

- (1) 75 percent of French electricity is nuclear. (Bauer et al, 2013, p. 318)

Shimada and Nagano (2018) propose a structure-based approach to the predicativity of RAdjs. First, as with previous studies (e.g. Levi, 1978), they claim that the predicative use of RAdjs is a result of the deletion of the modified noun. Then, they propose, based on Adger’s (2013) analysis of relational nouns, that the phrase nuclear electricity has the structure in (2).

- (2) [$\sqrt{\text{nucleus}}$ [$\sqrt{\text{electricity}}$ \bar{p}] \bar{p}] \bar{p} (Shimada and Nagano, 2018, p. 83)

The head in (2) \bar{p} is a relation-denoting functional element proposed by Adger (2013). It takes electricity as its complement and is modified by the noun nucleus, denoting nuclear KIND OF electricity. According to Shimada and Nagano (2018, p. 84), the head \bar{p} denotes kind, its specifier $\sqrt{\text{nucleus}}$ takes the RAdj form nuclear while \bar{p} itself remains covert in English. Given this structure, when the complement of \bar{p} is deleted, the predicative RAdj occurs. Here, the deleted noun needs to be recoverable. Shimada and Nagano (2018) argue that if \bar{p} remains null, its recoverability depends on the context where the RAdj occurs. Therefore, contextual contrast is called for in (1).

The above analysis encounters a problem when we observe RAdjs derived from neo-classical compounds; they can appear independently in the predicate position without any help of semantico-syntactic contexts, as shown in (3).

- (3) This compound is insecticidal.

The paper is organized as follows. Section 2 outlines the concept of English RAdjs and their properties. It also provides an interesting problem concerning with RAdjs and a deletion analysis based on Levi's (1978) to account for the problem. Section 3 introduces Adger's (2013) and Shimada and Nagano's (2018) analysis to RAdjs' predicativity. Section 4 investigates RAdjs whose head is combining form. In addition, extending Shimada and Nagano's (2018) analysis, this chapter also proposes that English has two types of RAdjs when they are in the predicate position. One is in need of certain semantico-syntactic contexts of contrast, the other is not. Finally, section 5 summarizes this thesis and offers concluding remarks.

2. RAs' Predicativity

2.1 Relational Adjectives

Some authors gave criteria to define relational adjectives (e.g. Levi, 1978; Bally, 1944; Beard, 1995; Bisetto, 2010; Cetnarowska, 2013; and many others). As reviewed by Plag (2003, p. 94), denominal adjectives in English can be largely divided into two major groups: qualitative adjectives (QAdjs) and relational adjectives (RAdjs).^{[1] [2]} QAdjs indirectly modify the noun, or they occur in predicative position in a clause (Plag, 2003, p. 94). They express more specific properties or qualities of nouns as can be seen with *beautiful* in *a beautiful princess*, namely 'a princess who is beautiful,' (Plag, 2003; Nagano and Shimada, 2016, p. 221). RAdjs differ from QAdjs in that the former inherits the property from nouns (cf. Nagano, 2013). Here are the prototypical properties of RAdjs (Nagano, 2016, p.44; cf. Levi, 1978; Beard, 1995, p. 187–188, Raskin and Nirenburg, 1995; Bisetto, 2010):

- (4)
- a. In modifying a noun, the derivative expresses a relation between the base noun and the head noun rather than a quality/property of the head noun.
industrial output 'output of an industry'
 - b. In modifying a noun, the derivative requires strict adjacency to the modified noun in a unique position.
**wooden big table* vs. *big wooden table*
 - c. The derivative lacks gradability and comparativeness.
**a very industrial output, *more industrial*
 - d. The derivative lacks predication possibility.
**this output is industrial, *this decision is senatorial*
 - e. The derivative does not potentiate further nominal affixation.
??presidentialness, ??racialness

As (4d) shows, RAdjs are usually attributive only (Bally, 1944; Beard, 1995; Plag, 2003; MacNally and Bolenda, 2004; Rainer, 2013). However, there is the case that RAdjs may occur in the predicate position:

- (5)
- a. The process by which compounds are formed is transformational.
 - b. Her infection turned out to be viral.
 - c. His razor is electric.
 - d. Question formation in Finnish is morphemic.
 - e. The therapy David does is primarily musical.
 - f. That interpretation is presidential, not judicial.

(Levi, 1978, p. 254)

Let us review Levi's account of this case in next section.

2.2 Levi's (1978) Account

According to Levi (1978), RAdjs have the following derivation process from (6a) to (6d) when they appear in the predicate position:

- (6) a. a nuclear of electricity
- b. an of-electricity nuclear
- c. an electricity nuclear
- d. an electrical nuclear

(cf. Nagano, 2018)

In her view, the RAdj formation from (6c) to (6d) is adjusted morphologically as an attributive modifier. The RAdj-N (*electrical nuclear*) is semantically same to the N-N (*electricity nuclear*). That is, RAdj-N can be considered to be parallel with N-N. Since N-N also cannot be used predicatively (e.g. *this cake is *apple*), RAdj-N cannot normally.

In her analysis, the predicative use of RAdjs is a result of the deletion of the modified noun. Simply, “the adjective remains relational but occurs on its own because its modified NP can be deleted under identity with a noun in the subject position of a copular sentence (Shimada and Nagano, 2018, p. 63; cf. Levi, 1978),” like (7).

- (7) 75% of French electricity BELONG TO nuclear ~~electricity~~.
- 75% of French electricity is nuclear.

(Shimada and Nagano, 2018, p. 63)

In this sentence, the second occurrence *electricity* can be deleted in the underlying structure, because the RAdj indicate the relation with the noun (Shimada and Nagano, 2018). Note that the phenomenon is not accepted at any time. Levi (1978) gives a detailed explanation, specifying the following three conditions for this phenomenon.

First, the subject of the sentence and the stranded RAdjs should be established as a class name. :

- (8) Class Establishment
 - a. {Our engineers/*Those agents/*My relatives} are all chemical.
 - b. {Those agents/*Our engineers/*My relatives} are all theatrical.

(Levi, 1978, p. 256)

The sentence in (8a) shows that the RAdj *chemical* can occur in the predicate position with our engineers because *chemical engineer* is established as a name classifying engineers. When the combination is established, it is possible for RAdj-N to undergo the deletion process. That is, the deleted noun (i.e. *engineers*) can be recovered in situ (i.e., Our engineers are all chemical *engineers*.) since the adjective remains relational with the noun.

Second, subjects should be definite; thus, all the examples in (9), whose subjects in their relative clauses are indefinite, are not acceptable.

- (9) Definiteness
 - a. I wish I had some {musical talent / *talent that was musical}.
 - b. Rita wants to edit a {linguistic journal / *journal which is linguistic}.
 - c. We're tempted to press {criminal charges / *charges that are criminal}.
 - d. The prize money is for {regional novelists / *novelists who are regional}.

(Levi, 1978, p. 258)

Third, the predication of RAdjs “are consistently and markedly more acceptable when used in an explicit or implicit comparison than when they are used alone (Levi, 1978, p. 260)”:

- (10) Explicit contrast
 - a. Her infection turned out to be {viral, not bacterial / viral}.
 - b. The strongest drives toward pollution control have been {governmental rather than industrial / governmental}.
 - c. Our firm's engineers are all {mechanical, not chemical / mechanical}.

- d. That interpretation of the subpoena is {presidential, not judicial / presidential}.
(Levi, 1978, p. 260)

Firstly, let us observe explicit contrast in (10). In terms of *infection* in (10a), the comparison between *viral* and *bacterial* is concern with the noun ellipsis. The explicit comparison makes it possible to recover the deleted noun. Moreover, there are some cases where RAdjs show predicability without such an overt contrastive element (i.e. a not-phrase).

- (11) Implied contrast
- a. The therapy he does is {primarily musical / ?musical}.
 - b. The novelists we studied were {mostly regional / ?regional}.
 - c. The equipment they sell is {mainly culinary / ?culinary}.
- (Levi, 1978, p. 260)

The adverbs establish as implicit contrast between the class named by the adjective and other alternatives not overtly expressed. For instance, the adverb *primarily* in (11a) function to imagine other alternative means of therapy he does in addition to the musical therapy, such as hormonal, magnetic, animal. The implicit comparison makes it possible to recover the deleted noun as well as explicit comparison.

We have observed Levi's explanation of English denominal adjectives in predicate position.^[3] In particular, it is worth mentioning that the relationship between the head noun ellipsis and its recoverability. The recoverability is attributed to semantico-syntactic contexts of contrast. In other words, the recoverability of RAdjs depends on some condition in semantico-syntactic contexts of contrast as Levi presents.

3. Process of RAs' Predicativity

In this section, let us introduce Adger's (2013) and Shimada and Nagano's (2018) to explain why RAdjs can be used predicatively in semantico-syntactic contexts of contrast. Adger's (2013) analyze relational nominals, such as *an edge of the table*, using a relation-denoting functional head \bar{r} . Shimada and Nagano's (2018) apply Adger's (2013) analysis of relational nouns to RAdjs.

3.1 Adger's (2013) Account

It is traditionally known that a relational noun in a complex nominal take a complement as internal arguments. In complex nominals such as *edge of the table* and *photo of Lily*, Adger (2013) claims that it is not correct to state that the relational noun *edge* takes the *table* as its argument. Rather, the two nouns are related to each other by a relation-denoting functional head \bar{r} . The head \bar{r} , proposed by Adger, "is responsible for the argument structure that encodes relationality (Shimada and Nagano, 2018, p. 66)," such as PART, KIND, POSSESSION and REPRESENTATION. These subtypes of the functional head \bar{r} and their examples are following:

- (12) a. PART: an edge of the table
 b. REPRESENTATION: a photo of Lilly
 c. KIND: an uncle of John

(cf. Adger, 2013, p. 60, 78)

In the case of *edge of the table* in (12), the following process are intended to provide a basic idea of this analysis:

- (13) edge of the table
- a. [\bar{r} PART] of the table
 - b. [edge PART] of the table

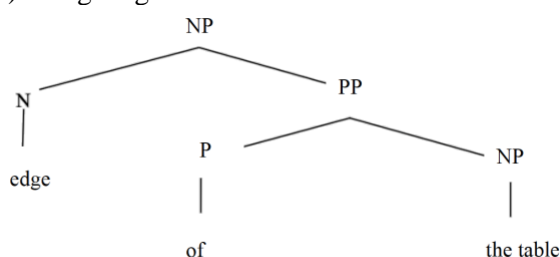
c. edge of the table

(cf. Shimada and Nagano, 2018, p. 66))

In (13a), PART, a subtype of ρ , takes the table as its argument. Then, it gets concrete content from the relational noun edge. In this analysis, edge is a specifier and a predicate modifier of the relational head. The change from (13a) to (13b) represents the process of the predicate modification. Finally, the head ρ is not pronounced and not realized in a morphological manner. In brief, a relational noun in a complex nominal does not take a complement as internal arguments, but rather, the head ρ plays an important role to show the relation between the two nouns in the argument structure (Shimada and Nagano, 2018).

Before we observe a structure using the functional head ρ , let me introduce a structure of N-PP, such as edge of the table.

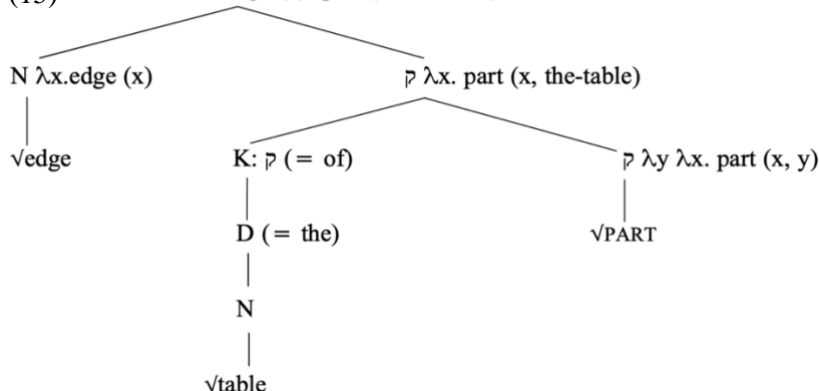
(14) Eng. edge of the table



This is composed of the noun and the prepositional phrase (i.e. [N-PP]). Regarding the structure, edge establishes a sister relation with of the table, and edge dominates the PP. This apparently confirms the idea of that relational nominals can take complements as transitive verbs do.

In Adger’s view, a relational noun and its seeming complement are not in a sisterhood configuration in contradiction to the structure of (14). Rather, “their relationship is negotiated by a third element, which is a real head of the DP structure building (Shimada and Nagano, 2018, p. 80).” The structure of the head ρ adopted by Adger is represented as follows:

(15) $\rho \lambda x. \text{edge}(x) \wedge \text{part}(x, \text{the-table})$



(Adger, 2013, p.78; cf. Shimada and Nagano, 2018, p. 81)

In this structure, the distance between the PP and the NP is slightly farther than that in (14). Additionally, the PP is selected by ρ , not by the NP, as compared with the structure of (14). The head in

(15) “is rooted by a light root (Shimada and Nagano, 2018, p.81),” such as PART, KIND, POSSESSION, REPRESENTATION, and others. These are not pronounced and not morphologically realized as mentioned above. They are “purely abstract functions (Shimada and Nagano, 2018, p. 81).” The other roots, non-capitalized ones, are referred to heavy roots, and they correspond to lexical items. According to this analysis, edge is a specifier, which semantically enriches the content of the light root PART, and it modifies the relational head as in $\lambda x. \text{edge}(x) \wedge \text{part}(x, \text{the-table})$.

3.2 Shimada and Nagano's (2018) Account

Based on Adger (2013), Shimada and Nagano (2018) analyze the construction of RAdjs in the predicate position. They claim that some RAdjs possess the same structures as relational nominals and that RAdj stranding can be seen as the deletion of the element in the complement position of the \bar{p} head. Then, they indicate that Adger's DP theory provides an approach to RAdj stranding in much more general terms than Levi (1978) used, namely deletion head noun. The following example is RAdjs + noun combination, based on the basic idea of Adger's analysis.

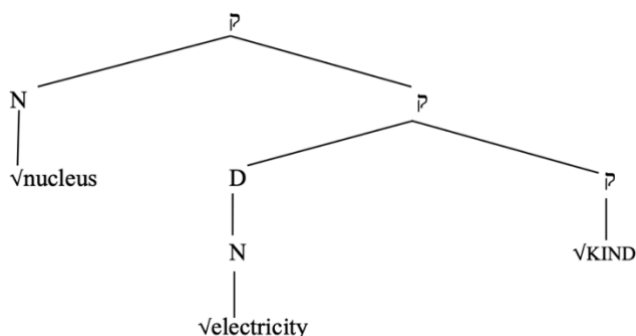
- (16) nuclear electricity
 a. [\bar{p} KIND / TYPE] of electricity
 b. [nuclear KIND / TYPE] of electricity
 c. nuclear KIND of electricity
 d. nuclear electricity

(cf. Shimada and Nagano, 2018, p. 66)

First, the head \bar{p} takes electricity as its complement, and consequently the component of \bar{p} and its complement denotes 'kind of electricity', as shown in (16a). Second, the head \bar{p} , which is rooted as KIND or TYPE, gets concrete content from the specifier nuclear in (16b). The process of the predicate modification is represented from (16a) to (16b). Note that there is a significant difference from Adger (2013), in that "nuclear is NOT a modifier with respect to electricity. Rather, it is a modifier of KIND, which then connects it to electricity (Shimada and Nagano, 2018, p. 82)." This view is apparently reasonable to consider that a RAdj + noun combination can be rephrased as RAdj + type/kind + of + noun as shown in (16c). In this connection, the head \bar{p} neither enters into pronunciation nor appears as a word.

The following represents the construction of a RAdj extending Adger's analysis of relational nouns.

- (17) Eng. nuclear electricity



(Shimada and Nagano, 2018, p. 83)

In this structure, a heavy root electricity is selected by \bar{p} , which is rooted by a light root KIND. The specifier nucleus semantically enriches the content of the light root KIND, and it modify the relational head KIND of electricity (i.e. nuclear [KIND of electricity]).

4. Application to My Data

In this section, let us consider the predicative use of RAdjs from combining forms (CFs).^[4]

- (18) a. insecticide 'killer of an insect'
 b. hydrophobia 'fear of water'

(Nagano, 2016, p. 61; cf. Scalise and Bisetto, 2009, p. 47)

These instances are composed of two components, which can be free or bound forms, while RAdjs we have observed are denominals. CF-headed RAdj + noun combinations can be equivalent to RAdj +

noun combinations because they both combinations present an adjectival suffix such as -al, -ic, and -ous, which changes the base noun's syntactic category but causes no semantic change. Thus, in our view, the CF-headed RADjs are considered as the same as RADjs. With this in mind, let us observe the data of CF-headed RADjs as follows:

- (19) a. mesophilic and thermophilic conditions, thermophilous fungi
- b. insecticidal activity, pesticidal genes
- c. carcinogenic substance
- d. herbivorous birds

(Nagano, 2016, p. 62; Odagiri et al., 2019, underlining mine)

These data also show that RADjs from CFs can be used as attributive modifiers like RADjs.

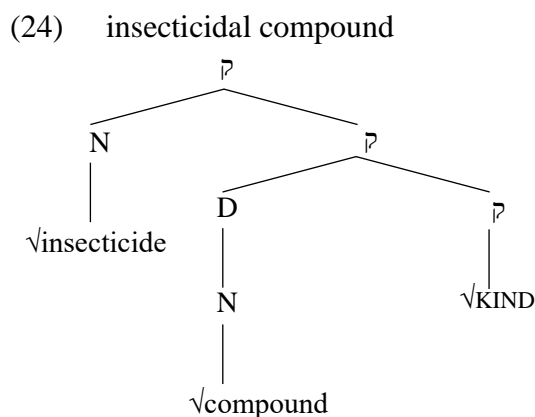
Returning to the predication of denominal adjectives, it is a result of the deletion of modified nouns, and the noun ellipsis is licensed by the involvement of the \bar{p} -headed structure. In English, its recoverability of the \bar{p} head is enhanced by certain semantico-syntactic contexts of contrast since the \bar{p} head is covert. However, CF-headed RADjs behave differently from this evidence.

- (20) a. This compound is insecticidal.
- b. This compound is insecticidal, not rodenticidal.
- (21) a. These bacteria are thermophilic.
- b. These bacteria are thermophilic, not cryophilic.
- (22) a. This substance is carcinogenic.
- b. This substance is carcinogenic, not ulcerogenic.
- (23) a. These birds are herbivorous.
- b. These birds are herbivorous, not carnivorous.

(Odagiri et al., 2019; cf. Lasserre and Montermini 2015)

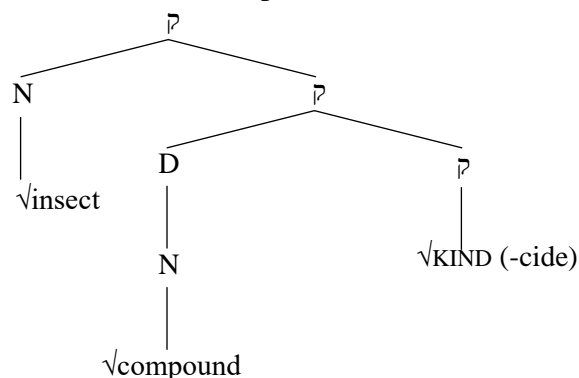
The CF-headed RADjs appear in the predicate position. Moreover, there is no difference about accessibility between the (a) sentences and the (b) sentences (Odagiri et al., 2019). This indicates that the CF-headed RADjs can appear in predicate position without semantico-syntactic contexts unlike non-CF-headed RADjs.

Let us apply the Adger's DP theory to the instance insecticidal compound



Taking the parallel with RADjs into account, the combination insecticidal compound is seemingly represented in the above, but this cannot explain the predicativity of CF-headed RADjs. The observation suggests that this difference is attributed to the CFs. Its genuine structure can be expressed in the following manner.

(25) insecticidal compound



(25) provides the hypothesis that CFs are realization of the $\bar{\rho}$ head just like classifiers of expanded modifiers. First, *compound* is selected by $\bar{\rho}$ (i.e. *KIND of compound*). The representation *KIND of compound* stands for *X-cide compound* ‘X-killing compound’. It is interpreted with the head-complement relationship. Further, the specifier *insect* semantically enriches the content of the light root *KIND* and it modify the relational head *KIND of compound*. In other words, the specifier fills the variable X in *X-cide compound*. This account for CFs is parallel to that for classifiers. Both CFs and classifiers are bound morphemes, and they have specific meanings. CFs in English, in a sense, may morphologically function to recover the deleted complement in the same way as classifiers in Japanese and (cf. Nagano, 2016; Shimada and Nagano, 2018).

5. Concluding Remarks

This paper has been the predicative use of denominal adjectives in English. As previously mentioned, though the predicative use of RADjs is a result of the deletion of the modified noun, the difference may be attributed to how to recover the deleted element. In English, the deleted complement is semantico-syntactically recovered, while the deleted complement is recovered without contrast in semantico-syntactic context (i.e. CFs).

Acknowledgements

I would like to thank the chairs, Yuichi Ono and Masaharu Shimada. I am also grateful to all the people who gave me helpful comments. Needless to say, all errors and shortcomings in this thesis are naturally my own.

Notes

[1] The definition of the term ‘adjective’ in the grammatical classification of words (e.g. noun, verb, adjective, adverb) has been argued for many years (Jespersen, 1924; Lyons, 1977; Crystal, 1985; Baker, 2003; among many others). However, in this paper, note that it is required RADjs and QADjs to be ‘derived from nouns by means of suffixes (Quirk et al., 1985, p.432; cf. Plag, 2003)’.

[2] The other type of adjective is excluded, for example, the derived adjectives with the adjectival suffixes such as *a-*, *-s*, *-ward(s)*, and *-wise* in this paper (Nagano, 2015; cf. Beard, 1995).

[3] According to Nagano, these Levi’s conditions “can be seen as answers to an implicitly or explicitly posed D(iscourse)-linked wh-question for classification, such as *Which type of infection was her infection?* and *Which type of razor does he favor?* (Nagano, 2018, p. 194)”

- (i) a. Which type of infection was her infection?
–Her infection turns out to be viral.
- b. Which type of razor does he favour?
–His razor is electric

(Levi, 1978, p. 254)

This Q&A perspective appropriately capture Levi's three conditions.

[4] The concept is difficult to define, and the definitions often diverge. See Amiot and Dugas (2020) for highlighting the fact that the notions of CF and affixoid actually cover a large number of heterogeneous phenomena.

References

- Adger, David (2013) *A syntax of substance*, Cambridge, MA, MIT Press.
- Amiot, Dany, and Edwige Dugas (2020) "Combining Forms and Affixoids in Morphology," *Oxford Research Encyclopedia of Linguistics*, Retrieved 4 Nov. 2020.
- Baker, Mark C. (2003) *Lexical Categories*, Cambridge University Press, Cambridge.
- Bally, Charles (1944) *Linguistique générale et linguistique française*, 2nd edition, A. Francke, Berne.
- Bauer, Laurie, Rochelle Lieber, and Ingo Plag (2013) *The Oxford Reference Guide to English Morphology*, Oxford University Press, Oxford.
- Beard, Robert (1995) *Lexeme-Morpheme Base Morphology: A General Theory of Inflection and Word Formation*, State University of New York Press, Albany.
- Bisetto, Antonietta (2010) "Relational Adjectives Crosslinguistically," *Lingue e Linguaggio* 9(1), 65–85.
- Cetnarowska, Bożena (2013) "Polish and English Denominal Adjectives: Lexical Ambiguity and Alternate Syntactic Configurations," *Ambiguity: Multifaceted Structures in Syntax, Morphology and Phonology*, ed. by Anna Bondaruk and Malicka-Kleparska Anna, 91–109, Wydawnictwo KUL, Lublin.
- Crystal, David (1985) *A Dictionary of Linguistics and Phonetics*, 2nd edition, Basil Blackwell, Oxford/Lodon.
- Jespersen, Otto (1924) *The Philosophy of Grammar*, George Allen & Unwin, London.
- Lasserre, Marine and Fabio Montermini (2015) "Neoclassical Compounds as Relational Adjectives," *MMM 9 Online Proceedings*, 64–76.
- Levi, Judith N. (1978) *The Syntax and Semantics of Complex Nominals*, Academic Press, London.
- Lyons, John (1977) *Semantics*, 2nd edition, Cambridge University Press, Cambridge.
- MacNally and Bolenda (2004) "Relational Adjectives as Properties of Kinds," *Empirical Issues of Formal Syntax and Semantics* 5, ed. by Patricia Cabredo Hofherr and Olivier Bonami, 179–196, Université Paris VII, Paris.
- Nagano, Akiko. (2013) "Morphology of Direct Modification," *English Linguistics* 30(1), 111–150.
- Nagano, Akiko. (2015) "Eigo-no Kankei-Keiyooosi (Relational Adjectives in English)," *Gendai-no Keitairon to Onseigaku · On'inron-no Siten to Ronten (Present-day Morphology and Perspectives and Argument of Phonetics · Phonology)*, ed by Tesuo Nishimura and Shin-ichi Tanaka, 2–20, Kaitakusha, Tokyo.
- Nagano, Akiko (2016) "Are Relational Adjectives Possible Cross-Linguistically? The Case of Japanese," *Word Structure* 9(1), 42–71.
- Nagano, Akiko (2018) "A Conversion Analysis of So-Called Coercion from Relational to Qualitative Adjectives in English," *Word Structure* 11(2), 185–210.
- Nagano, Akiko and Masaharu Shimada (2015) "Relational Adjectives in English and Japanese and the RA vs. PP Debate," *MMM Online Proceedings 2015*, ed. by Jenny Audring, Nikos Koutsoukos, Francesca Masini, and Ida Raffaelli, 105–133.
- Nagano, Akiko and Masaharu Shimada (2016) *How poor Japanese is in adjektivizing derivational affixes and why*, *Word-Formation across Languages*, Cambridge Scholars Publishing, 219–240.
- Odagiri, Nana, Yuri Togano, Takashi Ishida, and Ryohei Naya (2019) "Niti-Eigo-ni okeru Kankei-Keiyooosi-no Keisei-Syudan to Zyutugo-iti-eno Seiki-Kanoosei (The Formation of Relational Adjectives and Their Predicability in English and Japanese)," paper presented at Morphology and Lexicon Forum 2019, 1st September, Kobe University.
- Plag, Ingo (2003) *Word-Formation in English*, Cambridge University Press, Cambridge.
- Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech, and Jan Svartvik (1985) *A Comprehensive Grammar of the English Language*, Longman, London.
- Rainer, Franz (2013) "Can relational adjectives really express any relation? An onomasiological approach," *SKASE Journal of Theoretical Linguistics* 10 (1), 12–40.
- Raskin, Victor and Sergei Nirenburg (1995) "Lexical Semantics of Adjectives: A Microtheory of Adjectival Meaning," Computing Research Laboratory, New Mexico State University.
- Scalise, Sergio and Antonietta Bisetto (2009) "The Classification of Compounds," *The Oxford Handbook of Compounding*, ed. by R. Lieber and P. Štekauer, 34–53, Oxford University Press, Oxford.
- Shimada, Masaharu and Akiko Nagano (2018) "Relational Adjectives Used Predicatively (But Not Qualitatively): A Comparative-Structural Approach," *Lexique* 23, 62–89.