Prefixed Relational Adjectives and Their Predicativity in English

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Abstract: It has been widely acknowledged that Relational Adjectives (RAdjs), one type of denominal adjectives, cannot occur in predicate position (e.g. Bisetto, 2010; Nagano, 2013). However, under some conditions revealed by Levi (1975, 1978) and Nagano (2016, 2018), they can. Moreover, as observed by Levi (ibid.), when numerical prefixes are attached to relational adjectives to form *Prefixed Relational Adjectives* (P-RAdjs), they also can (e.g. *monochromatic*, *binational*). On this basis, this paper first reviews what kinds of conditions are associated with RAdj predicativity. We then observe the conditions in detail in light of *ellipsis* and *contrast* (cf. Winkler, 2019; Molnár and Winkler, 2010). Finally, in terms of P-RAdjs, although Levi (ibid.) adduces only the case of numerical prefixes (e.g. *mono-*, *bi-*, *tri-*), we additionally show that predicativity holds in the case of non-numerical prefixes (e.g. *pre-*, *post-*, *extra-*; cf. Ishida, 2019).

Keywords: denominal adjective, predicativity, N-deletion, gapping, contrast, prefix

1. Introduction

It is well known that denominal adjectives in English can be divided into two types as in (1).

(1) a. Relational adjectives (RAdjs): *senatorial, polar, algebraic*
     b. Qualitative adjectives (QAdjs): *beautiful, picturesque, nervous*

(Plag, 2003, p. 94; Nagano, 2015, p. 3)

In comparison to QAdjs in (1b), whose main function is to *qualify* the referent of nouns, RAdjs in (1a) serve to *classify* a type of nouns (cf. Shimamura (2014)). These two distinct types of denominal adjectives can be considered parallel to the case of deverbal nominals. For example, there are two types: result nominals (e.g. *-ment*, *-tion*) and (complex) event nominals (e.g. *-ing*). Result nominals behave more like 'nouns' than event nominals, whereas event nominals behave more like 'verbs' than result nominals. Thus, they differ in how much they maintain their categorical status as 'verbs'. In this sense, since RAdjs inherit considerably more nominal properties than QAdjs, they are considered 'noun-like adjectives', while QAdjs are 'typical adjectives'.

RAdjs are formed by adding purely morphological suffixes derived from Romance languages, such as *-al*, *-ar*, *-ic*, and *-ical*, to the bases, and they directly modify nouns. Therefore, there is no semantic difference between RAdj-N expressions in (2) and N-N expressions in (3).

(2) a. industrial output   (3) a. industry output
     b. cellular structure   b. cell structure
     c. senatorial leadership   c. senate leadership
     d. budgetary item   d. budget item

(Beard, 1995, p. 188)

For example, the RAdj-N *industrial output* in (2a) means 'output of an industry'. This is the same as the N-N *industry output* in (3a) (see also (4a)). In addition, as mentioned above, the behaviour of RAdjs is almost equivalent to that of nouns in what follows (cf. Levi, 1978; Beard, 1995; Bisetto, 2010; Cetnarowska, 2013; Nagano, 2015; Nagano, 2018):

(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*

(Nagano, 2016, p. 44)

These behaviours are completely different from those of QAdjs. In this paper, we will pay particular attention to the property (4d). RAdjs are known to lack the possibility of predication (i.e. predicability). This property has long been controversial and is one of the issues concerning RAdjs, because, according to Levi (1975, 1978), there are many cases where RAdjs may occur in 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)

Indeed, all the RAdjs in (5) unproblematically occur in predicate position. Levi (1975, 1978) argues, based on her meticulous observations, that RAdjs' predicativity is conditioned by certain semantico-pragmatic factors. We will observe this in detail in the following section. Moreover, one of Levi's remarkable findings is that RAdjs with numerical prefixes can also unquestionably appear in predicate position, unlike the forms without prefixes, as in (6) to (8):

(6)　a.　*　That analysis is chromatic.　　　　(chromatic analysis)
　　b.　　　Those drawings are monochromatic.　(monochromatic drawings)
(7)　a.　*　Those exports are national.　　　　(national exports)
　　b.　　　Those agreements are binational.　　(binational agreements)
(8)　a.　*　That structure is consonantal.　　　(consonantal structure)
　　b.　　　Those roots are triconsonantal.　　(triconsonantal roots)

(Levi, 1978, p. 24)

Let us call these RAdjs with prefixes "Prefixed Relational Adjectives" (hereafter, P-RAdjs). Levi herself problematises the above asymmetrical behaviour between RAdjs (i.e. (a)-expressions) and P-RAdjs (i.e. (b)-expressions), though she clearly states that she does not have a convincing answer, whence the following question naturally rises: what kinds of factors make it possible for RAdjs and P-RAdjs to occur in predicate position? This paper aims to answer this question and to show that some P-RAdjs whose prefixes are not numerical can also occur in predicate position. The data were collected mainly from the OED (Oxford English Dictionary) and the COCA (Corpus of Contemporary American English).

　　　This paper is organised as follows. Section 2 reviews previous studies (Levi, 1978 (2.1); Nagano, 2018 (2.2)) and attempts to extract a factor common to them. The main purpose of Section 2

is to clarify why RAdjs can occur in predicate position. Section 3 focuses on this factor (i.e. *N-deletion*) (3.1) and discusses how it is related to *contrast* from a prosodic perspective (3.2). Along these lines, Section 4 presents data of P-RAdjs including both numerical prefixes (4.1) and non-numerical ones (4.2). Section 5 briefly provides concluding remarks.

2. Predicativity

2.1. Levi's (1978) Account

We should begin by observing how Levi (1978) attempts to explain the predicativity of RAdjs. According to her, the RAdjs in predicate position 'are derived by **ellipsis** from their usual prenominal position […]'[sic] (ibid., p. 255). In Levi's transformational analysis, the ellipsis (i.e. head noun deletion) is applied at a very surface level and, as the arrow indicates, the formation process can be sketched as follows:

(9)　　Her infection is an infection caused by a virus.
　　　　Her infection is a virus-caused infection.
　　　　Her infection is a virus infection.
　　　　Her infection is a viral infection.
　　　　Her infection is viral.

(Levi, 1978, p. 255)

Thus, the RAdjs maintain their prenominal modification even in predicate position and they 'are subsequently left stranded when their head nouns are deleted […]' (ibid., p. 255). Levi (ibid.) gives a detailed explanation, specifying the following three conditions for this phenomenon.

　　　　First, the subjects of the sentence and the RAdjs left stranded in predicate position should be well-established as a class name. For example, the RAdj *chemical* in (10a) has created an entrenched name with the noun *engineers* but not with others (i.e. ?*chemical agents*, ?*chemical relatives*). The same is true of *theatrical agents* in (10b) (i.e. ?*theatrical engineers*, ?*theatrical relatives*). Hence:

(10)　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)

Second, subjects should be definite; thus, all the examples in (11), whose subjects in their relative clauses are indefinite, are not acceptable.[1]

(11)　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 RAdjs in predicate position 'are consistently and markedly more acceptable when used in an explicit or implicit comparison than when they are used alone' (ibid.: p. 260). Let us observe the explicit case in (12) first. In the example of (12a), in terms of *infection*, *viral* is compared to *bacterial* in a *not* phrase. This overt contrastive relation between *viral* and *bacterial* contributes to inducing the ellipsis of the head noun (i.e. *infection*). This holds for the other examples in (12) as well; thus:

(12)　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)

Moreover, there are some cases where RAdjs show predicability without such an overt contrastive element (i.e. a *not*-phrase). For example, when the adverb *primarily* modifies the RAdj *musical* in (13a), the acceptability of the whole sentence is better than where the RAdj is in predicate position alone. Some other adverbial modifiers (i.e. *mostly*, *mainly*) can modify RAdjs also, as in (13b, c).

(13)   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)

However, the adverbials should not indicate gradability or scalarity because RAdjs are known as non-gradable adjectives (see (4c)). What these adverbials actually do is neither add semantically gradable information to RAdjs nor make RAdjs gradable adjectives (i.e. QAdjs), but *implicitly classify* what the combination of RAdjs and nouns indicates in context. Regarding (13a), thus, when there is a *primary* therapeutic remedy in his clinic and it is *musical* one, we can easily assume that there are other alternative means of therapy he performs, such as *musical*, *hormonal*, *animal*, *herbal*, and *aromatic*. Additionally, Levi (1978) points out that negation can imply contrasts.

(14)   Negation (implied contrast)
    a.   I wish I had some talent that wasn't musical.
    b.   Rita wants to edit a journal which isn't linguistic.
    c. ? The prize money is for novelists who are not regional.

(Levi, 1978, p. 261)

Accordingly, Levi's (1978) analysis of the ellipsis of head nouns can be reduced to the above three conditions (i.e. (i) class-establishment; (ii) definiteness; (iii) contrast). Nagano (2018) also focuses on this phenomenon and further summarises the above three conditions as one from a pragmatic point of view, which will be shown in the next subsection.

2.2. Nagano's (2018) Account

Nagano (2016, 2018) also has an awareness of the issue involved. She points out that the example in (15) may also be a case of head noun ellipsis. Specifically, the subject of the sentence *75 percent of French electricity* can be considered to yield an implied contrast.

(15)   75 percent of French electricity is nuclear.   (cf. Bauer, Lieber & Plag, 2013, p. 318)

In this case, the quantifier *75 percent* functions just like adverbials such as *primarily* and *mainly*. Thus, we can infer that the remaining *25 percent* of French electricity may be based on different energy sources (e.g. *hydraulic*, *wind*, *terrestrial*, *thermal*, *solar*). Nagano (2018) attempts to show how the above three conditions can be reduced to a more theoretical explanation. She suggests D(iscourse)-linked *wh*-questions (i.e. *Which type ~?*; cf. Harada, 1973; Pesetsky, 1987). The sentences in question are seen as answers to the given questions (Nagano, 2018, p. 194). Thus:

(16)   a.   Which type of infection was her infection?
            — Her infection turned out to be viral.   (= (5b))
        b.   Which type of razor does he favour?
            — His razor is electric.   (= (5c))

As Nagano summarises, 'a D-linked question is posed based on a presupposition of a set of specific alternative candidates for the question item, and the respondent picks one from the set in giving an

answer' (ibid., p. 194). This can be applied to the case of class-establishment (see (10)). For example, when the sentence *Our engineers are all chemical* in (10a) is used as an answer to the question *What kind of engineers does your company already have?*, it sounds quite natural (ibid., p. 194). According to Nagano (2018), the speaker answers this question by choosing one of the alternative set of *engineers* (e.g. *mechanical*, *chemical*, *electrical*, *sanitary*).

Hence, the three conditions advocated by Levi, which allow RAdjs to occur in predicate position, can be reduced to D-linked questions according to Nagano (2018); namely, the adjectives in question can be left stranded in predicate position as an answer to a given D-linked question. What we should do next is consider the mechanism of the omission of nouns in detail (cf. Sleeman, 1996; Bouchard, 2002; Alexiadou and Gengel, 2012, amongst others). We will delve into this issue in the following section.

3. N-Deletion and Contrast

In the preceding section, we observed how previous studies have analysed the predicativity of RAdjs. A common factor is the deletion of nouns (henceforth, N-deletion). We will observe how N-deletion, under some conditions, can be implemented (3.1) and identify the relevant factors. As claimed by Levi (1978), we will discuss how such factors dictate the realization of a certain contrast by N-deletion, considering Winkler's (2019) study (3.2).

3.1. N-Deletion

First of all, let us recall that to the extent that stranded adjectives are not established as QAdjs, they basically maintain their prenominal modification (see Levi, 1978, §7.2); namely, the head nouns are phonetically null, or rather, more precisely, they are deleted in a very late step of derivation (cf. Nagano, 2016, 2018; Shimada and Nagano, 2018). This can be roughly sketched as follows:

(17) X *be* RAdjs N̶.

The motivation for the N-deletion analysis derives from the recoverability of the head nouns (based on Nagano, 2016, p. 45). For example, regarding the sentence in (15), nominals such as *electricity*, *type*, or *one* can be recoverable following the RAdj *nuclear*, as shown in (18).

(18) 75 percent of French electricity is nuclear {electricity / type / one}.   (cf. (15))

We may well consider the concept of *partitivity* (Sleeman, 1996, p. 34) with respect to the recoverability of the head nouns. According to Alexiadou and Gengel (2012, p. 204), *partitivity* requires an element included within a particular set. They then argue that English NP Ellipsis is licensed by means of *classifiers* such as *one* (e.g. *Talking about cars, I prefer a red *(one)*)) (Alexiadou & Gengel, 2012, p. 191). Without *one*-insertion, on the other hand, '(inherent) plural seems a crucial factor' (e.g. *Talking about wine, I prefer Australian* (**one*)) and '*one*-insertion in English is not always obligatory with adjectives' (ibid.). Therefore, quantifiers, possessives, or demonstratives will function to license English NP Ellipsis. This indicates, as contended by Alexiadou and Gengel (2012, p. 197), that 'all NP Ellipsis environments contain a Classifier phrase'.[2]

The N-deletion analysis is also morpho-syntactically motivated by the different behaviours of the two forms of Russian adjectives (Short Form (SF), Long Form (LF)). First, SF adjectives in Russian cannot be used prenominally as in (19a), whereas LF ones can as in (19b):

(19) a. * SF: vkusn-o   vino   b.   LF: vkusn-oe   vino
                good_{SF.NOM.N} wine   good_{LF.NOM.N} wine
                                                                    (Babby, 2010, p. 58)

Therefore, SF adjectives represent only a qualitative meaning as in (20a), whereas LF adjectives maintain their *classifying function* (see (4a)) even in predicate position as in (20b):

(20)	a.	SF:	Vino	bylo	vkusn-o.	'Wine was good / the wine was good.'
			wine$_{NOM.N}$	was	good$_{SF.NOM.N}$	
	b.	LF:	Vino	bylo	vkusn-oe.	'This / the wine was a good wine / one.'
			wine$_{NOM.N}$	was	good$_{LF.NOM.N}$	

<div align="right">(Babby, 2010, p. 75)</div>

Although English does not have such a distinction in forms of adjectives as Russian does, RAdjs in predicate position are normally considered to maintain their prenominal use. Ishida (2019) argues, based on this fact, that N-deletion can be a factor in implementing a contrast. In the next subsection, we will consider how N-deletion is concerned with contrast.

3.2. N-Deletion as Contrastive Ellipsis

This section attempts to answer the following question in particular: if the above N-deletion analysis is correct, what status do the stranded adjectives have as remnants and how do they relate to the contrast? As argued by Winkler (2019), based on the prosodic and information-structural literature on ellipsis, there are mainly two types of ellipsis: *contrastive ellipsis* in (21a) and *givenness-marking ellipsis* in (21b). Note that the capital letters highlight the accent:

| (21) | a. | MANNY plays the PIANO and ANNA ~~plays~~ the FLUTE. | (Gapping) |
| | b. | Manny plays the piano but Anna DOESN'T ~~play the piano~~. | (VP-Ellipsis) |

<div align="right">(Winkler, 2019, p. 360)</div>

The sentence in (21a) consists of a coordinate structure with parallel information structure. The verb *play* in the second conjunct is deleted and the remnants *Anna* and *flute* are given a contrastive pitch accent; thus, it is an instance of *gapping*. As for (21b), the redundant VP *play the piano* in the second conjunct, already given in the antecedent clause, is deleted; namely, this is an instance of VP-ellipsis. Winkler (2019) explains the relationship between deletability and ellipsis by combining the information-structural notion of *givenness* and *contrastive focus*:

(22)	a.	*Givenness-Marking Hypothesis* (GMH):
		Given material is deaccented or deleted at Phonological Form.
	b.	*Contrastive Remnant Condition* (CRC):
		Given information licenses a contrastive focus interpretation of the remnant(s). The contrastive remnant(s) must be assigned a strong contrastive pitch accent.

<div align="right">(Winkler, 2019, p. 363)</div>

The GMH states that syntactic material is deaccented or deleted at PF, in which case the material is either given or redundant. This seems to correspond to the N-deletion analysis in the previous section. The CRC plays an introducing role for PF and demands that contrastive remnants bear a strong contrastive pitch accent (cf. *Gap-Hypothesis*; Molnár and Winkler, 2010, p. 1398). Accordingly, as emphasised by Winkler (2019, p. 363), 'the CRC is functionally dependent on the GMH'. Given the fact that the adjectives in question are left stranded in predicate position, we can assume that they can be considered 'remnants' and they are thus expected to receive a strong pitch accent. According to our informant, this expectation follows from the following prosodic patterns exemplified in (23) and (24).

(23)	a.	*	That analysis is chromatic.	(= (6a))
	b.		That analysis is CHROMATIC ~~analysis~~ (, {but not/rather than} achromatic).	
(24)	a.	*	Those exports are national.	(= (7a))
	b.		Those exports are NATIONAL ~~exports~~ (, {but not/rather than} governmental).	

Although the sentences in (23a) and (24a) were unacceptable according to Levi's observations, after we provided the informant with contrastive context, he read them as in (23b) and (24b). Each remnant (i.e. *chromatic* and *national*) receives a strong pitch accent, as expected from Winkler (2019). This leads us to safely conclude that the N-deletion analysis can be associated with contrast. Furthermore, we investigated the case of P-RAdjs. As a result, interestingly, we confirm that P-RAdjs show much the

same prosodic pattern as RAdjs; however, there is a slight difference from (23) and (24). The informant puts the highlighted accents on prefixes only, as indicated in (25).

(25) a. Those drawings are MONOchromatic.
     b. Those agreements are BInational.

On the basis of this prosodic pattern, it can be argued that prefixes *per se* are important to guarantee the GMH and to satisfy the CRC. As suggested by Ishida's (2019) analysis of P-RAdjs, there are certain prefixes which evoke a set of alternatives and yield a contrast (cf. Ishida, 2019). For example, the numerical prefix *mono-* of *monochromatic drawings* means *drawings* using *one* colour, implying other supposed alternative types of *drawings* (e.g. *dichromatic*, *trichromatic*, or *multichromatic*). This can also be applied to other cases such as (7) and (8) as follows:

(26) a. Those drawings are {mono- / di- / tri- / multi-}chromatic.   (cf. (6b))
     b. Those agreements are {bi- / mono- / uni- / tri- / quadr- / multi-}national.   (cf. (7b))
     c. Those roots are {tri- / mono- / bi- / quadr-}consonantal.   (cf. (8b))

Interestingly, the RAdj *monochromatic* establishes a qualitative meaning: *drab, unvarying* (*OED*, s.v. *monochromatic*). The prosodic pattern in this case is different from that of RAdjs as follows:

(27) Those drawings are monochromátic.

As shown, the prefix *mono-* generally does not receive a strong accent.

In summary, as suggested by Winkler's (2019) analysis of the relationship between the ellipsis and contrastive focus, we have clarified that the deletion of head nouns of RAdjs in predicate position (i.e. N-deletion) is followed by the GMH. As a result, by applying the CRC, the stranded RAdjs receive a strong pitch accent which results in a contrastive focus. In this way, we are now in a position to argue that N-deletion and contrast are closely related to each other in licensing the predicativity of RAdjs. Moreover, this analysis can be further applied to the case of P-RAdjs. In this case, however, the prefixes *per se* play a crucial role in yielding a contrast by evoking a set of alternatives. I will note in passing that what we have called P-RAdjs so far seem to be limited to the case of 'numerical prefixes'. Are there any other prefixes that can be analysed in the same way? We will show in the next section, based on Ishida's (2019) argument, that some non-numerical prefixes can.

4. Data on P-RAdjs

This section focuses mainly on presenting data. On the basis of the above discussions, we will show not only numerical prefixes (4.1) but also non-numerical prefixes (4.2) attached to RAdjs in what follows. The data have been collected from the *Oxford English Dictionary* (OED) and the *Corpus of Contemporary American English* (COCA).

4.1. The Case of Numerical Prefixes

First of all, we begin by observing the case of numerical prefixes, adding other data cited from Levi (1975, p. 323).

(28) Prenominal form; Predicative form
     a. *mono-*: monochromatic drawings;   Those drawings are monochromatic.   (= (6b))
     b. *bi-*:   binational agreements;   Those agreements are binational.   (= (7b))
     c. *tri-*:   triconsonantal roots;   Most Semitic roots are triliteral.
     d. *quadr-*: quadraphonic recordings;   The newest recordings are quadraphonic.
     e. *poly-*: polyphonic music;   Music that is polyphonic must be hard to write.
     f. *multi-*: multiracial population;   The population of Hawaii is multiracial.
     g. *omni-*: omnidirectional transmitter; The best transmitter is omnidirectional.
                                                              (Levi, 1975, p. 323)

Furthermore, it should be noted that these numerical forms can be coerced into QAdjs as follows:

(29) P-RAdjs as QAdjs
    a.   Although the Variation are almost <u>monochromatic</u> in their harmony, Ashton whisked them through a full range of colour and texture.   (*OED*, s.v. *monochromatic*)
    b.   The Divine Nature is revealed as <u>bi-polar</u>, or of double aspect.   (*OED*, s.v. *bipolar*)
    c.   Husband, wife and female lodger involved in a <u>triangular</u> relationship.   (*OED*, s.v. *triangular*)
    d.   What I have called the Situation was <u>multiplex</u>, <u>multipolar</u>, or <u>multisiliquous</u>.   (*OED*, s.v. *multisiliquous*)

The P-RAdjs in (29) are used *figuratively*. For example, the P-RAdj *triangular* in (29c) means not the shape of a triangle itself but a situation or a human relationship involving three persons. The process of how P-RAdjs are coerced into QAdjs remains undecided (see the discussion by Nagano, 2018).

4.2. The Case of Non-Numerical Prefixes

Let us now turn to the case of non-numerical prefixes. According to Ishida (2019), lexical prefixes such as Numerical (e.g. *mono-*, *bi-*, *tri-*), Spatio-temporal (e.g. *pre-*, *post-*, *ante-*, *extra-*, *intra-*), and Contrastive (e.g. *pro-*, *anti-*, *contra-*, *counter-*), and negative prefixes (e.g. *a-*, *non-*) can be inputs for creating P-RAdjs. The following P-RAdjs show their predicativity.[3]

(30)   a.   The consideration of Fallacies is <u>extralogical</u>.   (*OED*, s.v. *extralogical*)
    b.   A new business philosophy is emerging–a philosophy demanding that utilities shall be <u>prosocial</u> and brought forth ...   (*OED*, s.v. *prosocial*)
    c.   This is why classic Australian fiction, which at its best is <u>anti-colonial</u> and antiestablishment, is little read today.   (*The Guardian*)
    d.   The patient subsequently regained his preoperative weight, is <u>nondiabetic</u>, and requires pancreatic supplements (Viokase).   (Owens & Wolfman (1973))

The other non-numerical prefixes can be summarised in the following. The (a)-examples show the prenominal use and the (b)-examples the predicative use.

(31)   *ante-*
    a.   He [sc. Lyell] is concerned to attack the belief that these volcanic rocks can be sharply divided into <u>antediluvial</u> and <u>postdiluvial</u> categories.
    b.   Given that the hyenas were living in the cave before the flood, the cave itself must be also <u>antediluvial</u>.
    (*OED*, s.v. *antediluvial*)

(32)   *pre-*
    a.   Most of these errors stem from entrenched <u>predigital</u> habits of microphone placement and mixing the total balance at the studio controls.
    b.   The recording, from around 1964, is not only <u>pre-digital</u> but even <u>pre-Dolby</u>.
    (*OED*, s.v. *predigital*)

(33)   *post-*
    a.   The head is derived from...a number of <u>post-oral</u> segments.
    b.   Ontogenetically, the molluscan foot develops as a specialization of the gastrotroch area... and is thus <u>postoral</u> and not <u>circumoral</u>.
    (*OED*, s.v. *postoral*)

(34)   *extra-*
    a.   There are at least three important forms of <u>extra-somatic</u> sense-perception, viz., hearing, sight, and touch.
    b.   While referential meanings are <u>extralinguistic</u>, <u>extrasomatic</u>, and situational..., emotive meanings are <u>extralinguistic</u>, <u>somatic</u> and behavioral.
    (*OED*, s.v. *extrasomatic*)

(35) *sub-*
- a. Insects are essentially <u>sub-aerial</u> species.
- b. These <u>Sub-marine</u> Regions are as well stock'd with Variety of Animals and Vegetables, as the Surface of the Earth, which is only <u>Sub-aerial</u>.

(*OED*, s.v. *subaerial*)

(36) *contra-*
- a. <u>Contrafocal</u> ellipsoids, the sums of whose squared axes are the same in all three directions.
- b. The momental ellipsoids of these bodies are <u>contrafocal</u>, i.e. have the sum of the squares of any two principal diameters the same in each ellipsoid.

(*OED*, s.v. *contrafocal*)

Accordingly, as suggested in the preceding section, we can say that Levi's remarkable observations may be extended to the case of non-numerical prefixes.[4] Moreover, it is interesting to note that this type of P-RAdjs can also be used in a qualitative manner. The data are confirmed in (37).

(37) P-RAdjs as QAdjs
- a. The notion is <u>antediluvian</u>, and long ago exploded: no one thinks of following such advice now. (i.e. hyperbolical; very antiquated, ridiculously old-fashioned)

(*OED*, s.v. *antediluvian*)
- b. The graves are <u>prehistoric</u>. (i.e. hyperbolically; very old, primitive, out of date) (COCA)
- c. The <u>postmeridian</u> degrees of civilization (to preserve the author's metaphor) are less favourable to the popularity of the drama.   (*OED*, s.v. *postmeridian*)
- d. During the Night...we saw a perfect Rainbow, which was <u>extraordinary</u>. (i.e. emotional sense, expressing astonishment, strong admiration or the contrary)

(*OED*, s.v. *extraordinary*)
- e. The temperature was practically <u>sub-arctic</u>. (i.e. very cold)   (*OED*, s.v. *subarctic*)
- f. Their actions are supernatural, but not unnatural, or <u>contranatural</u>. (i.e. contrary to nature)

(*OED*, s.v. *contranatural*)

In this way, although we have shown a part of the data, non-numerical prefixes that are attached to RAdjs can also show predicability as well as numerical ones. The P-RAdjs in the above examples, except for the use of QAdjs, all involve N-deletion and contrast; thus, the non-numerical prefixes receive a strong pitch accent, as we have observed in the case of numerical ones in Section 3.2.

5. Concluding Remarks

This paper has mainly discussed previous studies and the relationship between *N-deletion* and *contrast* in terms of RAdj predicativity. In addition to Levi's (1975, 1978) observations, we have shown that some P-RAdjs whose prefixes are not only numerical but also non-numerical can also occur in predicate position. We are now in a position to answer the following question: what kinds of factors make it possible for RAdjs and P-RAdjs to occur in predicate position? First, RAdjs in predicate position can be observed to maintain their prenominal modification (i.e. N-deletion). Second, as argued by Winkler (2019), N-deletion is one of the crucial factors licensing contrast. In terms of contrast, the limited number of prefixes uniquely function to yield contrast by themselves. In other words, even if there are no additional modifiers such as adverbials (e.g. *primarily*) or quantifiers (e.g. *75 per cent*), prefixes *per se* contribute to evoking the set of other alternatives with ease.

Notes

[1] Note that the term 'definiteness' seems slightly puzzling because it sometimes includes such classes as articles, demonstratives, and quantifiers. If this condition were quite strong, how could we explain the examples in (3d) (e.g. *the output is industrial*)? In relation to a deictic expression, the timing of when RAdjs' *classifying function* is observed may play a role here. This idea was provided by Nobuhiro Kaga (University of Tsukuba). A detailed account of the exact reason why RAdjs cannot be used in a predicative manner, however, should be left for future research.

[2] Note that Alexiadou and Gengel (2012) focus on 'NP' ellipsis, which differs from our interest, 'N' ellipsis. However, they argue that 'an element specified for [+partitive] and [+focus] identifies an element that is included within a set' (ibid., p. 204). We assume that this element corresponds to *classifiers*; thus, along with their arguments, we refer to N-deletion as one of the types of NP ellipsis.

[3] Concerning the categorial status of *pro-* and *anti-*, please see the discussion by Naya and Ishida in this volume.

[4] However, as argued by Ishida (2019), prefixes such as Evaluative (e.g. *pseudo-*, *super-* (*sur-*), *sub-*, *hyper-*, *hypo-*), Negative (e.g. *mal-*, *un-*, *de-*, *dis-*, *in-* (*il-* / *ir-* / *im-*)), and Aspectual (e.g. *be-*, *en-*, *re-*) cannot serve as the input to create P-RAdjs because of their gradable and aspectual characteristics (see Nagano, 2013, for more detailed explanation).

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