Denominal Adjectives with an essive interpretation

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1 Characterizing Denominal Adjectives

Denominal adjectives (DAs) are adjectives morphologically correlated with a noun identified here as their base-noun (bse-N).

Formally, the nature of this correlation may be:
— totally transparent e.g. fra *industri-el* 'industrial' ← *industrie* 'industry',
— moderately transparent e.g. fra *triangul\aire* 'triangular' < lat *triangularis, triangle* 'triangle' < lat *triangulum*,
— totally opaque e.g. fra *municipal* 'municipal' < lat *municipalis* ∼ *commune* 'municipality' (Fradin, (to appear)).

A semantic classification of adjectives is given in Table 1. It shows that the way DAs semantically interact with the N they modify can be accounted for in an intersective manner for most of them. This holds true for
— classical 'relational' adjectives e.g. *presidential, thoracic* (McNally & Boleda, 2004)
— ethnic adjectives e.g. *Sicilian, Alpine* (Arsenijević *et al.*, 2014)
— some frequency adjectives e.g. *periodic*, provided they do not exhibit an adverbial reading as e.g. *occasional biker* (Gehrke & McNally, 2015).

Type	Simple A	Denominal A	French translation
Intersective	*blue car*	*mossy trunk*	*tronc moussu*
		thoracic surgeon	*chirurgien thoracique*
	Thai recipe	*Alpine biotope*	*biotope alpin*
	frequent breakdown	*periodic review*	*examen périodique*
Subsective	*swift player*		*joueur rapide*
Adverbial	*former biker*		*ex-motard*
	rare hiker	*occasional hiker*	*randonneur occasionnel*
Privative	*fake fur*		*fausse fourrure*

Table 1 – Compared classification of denominal and simple adjectives

The present contribution limits itself to the attributive use of denominal adjectives, whereby they modify their head-noun (henceforth hd-N). Noun phrases (actually incomplete noun phrases) with a DA will be abbreviated to DANPs.

The intersective account allows us to align the semantics of DAs with that of plain qualifying adjectives. For this account to work, the following general hypotheses have to be assumed (Gehrke & McNally, 2015):

(i) nouns denote properties of kinds: the numberless noun HORSE denotes the set of all kinds of horses (Arabian, Przewalski, etc.);

(ii) predicates apply to tokens ('o') or to kinds ('k'), which can be either objects or events;

(iii) a nominal phrase denotes tokens when it is inflected for Number: $horse_{sg}$ denotes the set of atomic tokens which instantiate some kind of horse, whereas $horse_{pl}$ denotes sets of token pluralities of some horse kind;

(iv) $\mathbf{R}$ is the realization relation introduced by (Carlson, 1977);

(v) deverbal participants e.g. *nomina agentis* have an event kind argument in their representation (Winter & Zwarts, 2012).

The derivation of *thoracic surgeon* is given in (1) (cf. Gehrke & McNally (2015)).

(1) a. $[[thoracic]] \equiv \lambda P_k \lambda x_k.[P_k(x_k) \wedge R(x_k, \mathbf{thorax})]$

b. $[[surgeon]] \equiv \lambda x_k \lambda e_k.[\mathbf{operate}(e_k) \wedge \mathbf{Agt}(x_k, e_k)]$

c. $[[thoracic\ surgeon]] = \lambda x_k \lambda e_k.[\mathbf{operate}(e_k) \wedge \mathbf{Agt}(x_k, e_k) \wedge R(x_k, \mathbf{thorax})]$

d. $[[_{Num}[thoracic\ surgeon]]] = \lambda y_o.\exists x_k \exists e_k[\mathbf{operate}(x_k) \wedge \mathbf{Agt}(x_k, e_k) \wedge R(x_k, \mathbf{thorax}) \wedge \mathbf{R}(y_o, x_k)]$

2 Varieties of denominal adjectives

DAs come in distinct varieties which are function of the relationship established between the bse-N and the hd-N. It has been argued that the semantic this relationship is exclusively the domain of pragmatics, on the ground that it is very often arbitrary and may exhibit a great variety of distinct realizations (Mezhevich, 2004).

However the variety of available relations, albeit large, is not infinite in each language and it differs from language to language (Rainer, 2013; Fradin, (to appear)).

Moreover, an approach based on context alone falls short of explaining why this relationship may directly determine the grammaticality status of the DANP cf. fra *visage très osseux* 'bony face' vs. **tuberculose très osseuse* lit. 'bony tuberculosis' (Fradin, 2007b,a). Contextual information only plays a role in the selection of the appropriate relation.

The aim of the present communication is (i) to investigate a variety of DAs that has been overlooked before, those expressing an essive relationship; (ii) to account for them in an intersective way, in keeping with recent proposals made for other denominal adjectives.

The relations that may exist between the hd-N and the bse-N fall in two categories:

Intrinsic relations The DA specifies a distinctive property e.g. *cône volcan-ique* 'volcanic cone' or the value of a dimension of the hd-N's referent e.g. fra *légume farin-eux* 'starchy vegetable': '**consistency**(vegetable) = **consistency**(flour)', *socle triangul-aire* 'triangular base': '**form**(base) = **form**(triangle)'.

Extrinsic relations The relationship is mediated by a predicate linked either with the hd-N or the bse-N (participant, origin relations) e.g. *bénédiction pap-ale* 'papal blessing' or with both (causal, spatial relations) e.g. *rivage insul-aire* 'island seashore', *virus apht-eux* 'aphthous virus'.

3 The essive interpretation

The essive interpretation is a sub-type of the extrinsic relations. It can be expressed by a copular sentence with an ascriptive use e.g. *prédicat verb-al* 'verbal predicate' = 'predicate (which) is a verb'.

In the ascriptive use, a property is ascribed to the subject-referent, whereas "the specifying use defines a variable and specifies its value" (Huddleston & Pullum, 2002, § 5.5.1.). The reverse order is possible with the specifying use only.

(2) a. His daughter was a highly intelligent woman. (ascriptive)
     b. The chief culprit was Kim. (specifying)

(3) a. *A highly intelligent woman was his daughter. (ascriptive)
     b. Kim was the chief culprit. (specifying)

(4) a. *Ce corps est un météorite.* (ascriptive)
        'This body is a meteorite'
     b. *Ce nombre est une fraction.*
        'This number is a fraction'
     c. *Cette ville est un port.*
        'This town is a port'

(5) a. **Un météorite est ce corps.* (ascriptive)
        'A meteorite is this body'
     b. **Une fraction est ce nombre.*
        'A fraction is this number'
     c. **Un port est cette ville.*
        'A port is this town'

Not all pairs of hd-Ns and bse-Ns allow an ascriptive use. In most cases, the result is completely non-sensical (cf. (6)). For that reason the ascriptive use is a reliable criterion to distinguish DAs with an essive interpretation from others. Examples of DANPs with this interpretation are given in Table 2.

(6) a. *cyclone tropical* (spatial relation)
        'tropical typhoon'

	N1 DA2 structure	Translation
(a)	*corps météoritique*	'meteoritic body'
(b)	*nombre fractionnaire*	'fractional numeral'
(c)	*prédicat verbal*	'verbal predicate'
(d)	*ville portuaire*	'portuary city'
(e)	*pêche industrielle*	'industrial fishing'
(f)	*sédiments alluvionnaires*	'alluvial sediment'
(g)	*nodule tumoral*	'tumoral nodule'
(h)	*hydrosystème lagunaire*	'lagoonal hydrologic system'
(i)	*industrie minière*	'mining industry'

Table 2 – Examples of essive interpretation (from frWaC)

b. *Ce cyclone est un tropique.*
   'This typhoon is a tropic'

c. *virus aphteux*   (causal relation)
   'aphthous virus'

d. *Ce virus est un aphte.*
   'This virus is an aphta'

e. *mesure angulaire*   (participant relation)
   'angle mesuring'

f. *Cette mesure est un angle.*
   'This measure is an angle'

4   Properties of the essive interpretation

As usual with DAs, the whole DANP denotes an entity which has all the distinctive properties of the bse-N's referent. This can be shown (i) through the positive / negative inferences that can be drawn from copular sentences where the DANP is the predicate. No such inferences are possible or even imaginable with DAs triggering other interpretations.

(7) a. *Ce corps est un corps météoritique.* ⊢ *Ce corps est un météorite.*
        'This body is a meteoritic body ⊢ This body is a meteorite'

     b. *Ce nombre est un nombre fractionnaire.* ⊢ *Ce nombre est une fraction.*
        'This is a fractional number ⊢ This number is a fraction'

(8) a. *Ce corps n'est pas un corps météoritique.* ⊢ *Ce corps n'est pas un météorite.*
        'This body is not a meteoritic body ⊢ This body is not a meteorite'

     b. *Ce nombre n'est pas un nombre fractionnaire.* ⊢ *Ce nombre n'est pas une fraction.*
        'This is not a fractional number ⊢ This number is not a fraction'

(9) a. #*Cette élection n'est pas une élection présidentielle* ⊬ *Cette élection n'est pas un président.*
        'This election is not a presidential election ⊬ This election is not a president'

     b. #*Ce virus n'est pas un virus aphteux.* ⊬ *Ce virus n'est pas un aphte.*
        'This virus is not an aphthous virus ⊬ This virus is not aphthous'

(ii) through the contradictions arising out of the impossibility of negating the ascriptive statement at the basis of the essive interpretation. Note however that this impossibility is gradual: categorical for some DAs, less so for others.

(10) a. *Ceci est un corps météoritique mais ce n'est pas un météorite.*
        'This is a meteoritic body but it is not a meteorite'

     b. *Ceci est un nombre fractionnaire mais ce n'est pas une fraction.*
        'This is a fractional numeral but it is not a fraction'

     c. *Ceci est une ville portuaire mais ce n'est pas un port.*
        'This is a port town but it is not a port'

d. *?Ceci est une insurrection révolutionnaire mais ce n'est pas une révolution.*
'This is a revolutionary uprising but it is not a revolution'

(11) a. *#Ceci est une élection présidentielle mais ce n'est pas un président.*
'This is a presidential election but it is not a president'

b. *#Ceci est un virus aphteux mais ce n'est pas un aphte.*
'This is an aphthous virus but it is not an aphta'

5   Triggering condition

For the essive interpretation to occur, the hd-N and the bse-N must denote an entity of the same type. Two cases can be been observed.

1) The hd-N denotes a hypernym of the bse-N. The hyperonymic / hyponymic relation is evidenced through copular sentences and the *sorte de* 'type of' test (Kleiber, 1994) as shown in (12). Examples illustrating this type are given in Table 3.

(12) a. *Une fraction est (un / une sorte de) nombre.*
'A fraction is a (sort of) number'

b. *Un minerai est une (sorte de) matière.*
'Ore is a (sort of) substance'

c. *La pêche est une (sorte d') industrie.*
'An industry is a (sort of) fishing'

(13) *Un port est une (sorte de) ville.*
'A port is a (sort of) town'

As shown by examples (13), not all DAs with an essive interpretation involve a hyponymic relationship.

The hyponymic / hyperonymic relation provides us with another criterion for testing the nature of the relationship between hd-N and bse-N. A term which is a semantic superordinate (hypernym) of another in a semantic network can be used as an associative anaphor of the latter (14). Applying this test to pairs hd-N / bse-N, where the hd-N is taken as the hyperonym, shows that only a subpart of the bse-Ns make the anaphoric relation possible (with a demonstrative). These are those where the bse-N is an hyponym of the hd-N.

(14) *Un **sanglier** traversa la route en courant. (Cet / l')**animal** était énorme.'*
'A wild boar ran across the road. (This | the) animal was huge'

Hypernym	Translation	Hyponym	Translation
corps	'(celestial) body'	*météorite*	'meteorite'
nombre	'number'	*fraction*	'fraction'
industrie	'industry'	*mine*	'mine'
prédicat	'predicate'	*verbe*	'verb'

Table 3 – Hyponym / hypernym relationship

(15)   a. *Au terme du calcul, on obtient une **fraction**. Ce **nombre** doit être ajouté au précédent.*
'At the end of the calculus, we get a fraction. This number has to be added to the preceding one'

   b. *Le **verbe** se place en tête de phrase. Ce **prédicat** n'est jamais accordé.*
'The verb appears in the sentence front position. No agreement takes place with this predicate'

   c. *La **pêche** a des rendements inquiétants. Cette (?**industrie** | **activité**) menace la vie marine.*
'The performance of fishing is a subject of concern. This (industry | activity) threatens life in the oceans'

   d. **Le **port** a de nouveaux bassins. Cette **ville** est très étendue.*
'The port has got new basins. This town is spread out'

Here too we observe that not all DAs with an essive interpretation pass the test. These DAs involve a distinct type of relation.

2) The hd-N and the bse-N denote entities sharing a core semantic content: location, activity type, eventuality, substance, etc., or performing / exhibiting similar functions cf. Table 4. The definitions given in the online New Oxford American Dictionary can help us to grasp what is at stake. The DANPs are given in French but the corresponding hd-Ns and bse-Ns are given and glossed in English.

sédiment alluvionn-aire:
— *sediment*: 'matter that is carried by water or wind and deposited on the surface of land or the bottom of a body of water. . . '
— *alluvium*: 'deposit of clay, silt. . . left by flowing streams in a river or delta'

ville portu-aire:
— *town*: 'area, with defined boundaries and local government, where people live. . . '
— *port*: 'town or city where ships load and unload'

pêche industri-elle:
— *fishing*: 'activity of catching fish'
— *industry*: 'economic activity concerned with the processing of raw materials. . . '

nodule tumor-al:
— *nodule*: 'a small swelling or aggregation of cells (. . .) especialy the abnormal ones'
— *tumor*: 'swelling of a part of the body (. . .) cause by abnormal growth of tissue'

The meaning overlap between the two Ns is indisputable and makes possible the ascriptive use, allowing thereby the essive interpretation.

6   Additional test

DANPs with an essive interpretation can never be substituted with a *de* 'of' PP embedding the bse-N, although this possibility is common for many DAs.

Hd-N	Translation	Bse-N	Translation
sédiment	'sediment'	*alluvion*	'alluvium'
ville	'town, city'	*port*	'port'
pêche	'fishing'	*industrie*	'industry'
nodule	'nodule'	*tumeur*	'tumor'

Table 4 – Equivalence relationships

(16)   a.   *Corps météoritique / *corps de météorite*
           'meteoritic body'

         b.   *nombre fractionnaire / *nombre de fraction*
           'fractional number'

         c.   *ville portuaire / *ville de port*
           'port city'

         d.   *prédicat verbal / *prédicat de verbe*
           'verbal predicate'

(17)   a.   *bénédiction papale / bénédiction du pape*'
           'papal benediction'

         b.   *cône volcanique / cône de volcan*
           'volcanic cone'

         c.   *son critallin / son de cristal*
           'sound of crystal'

This can be used as a test to eliminate cases such as *ferronnerie artistique* 'wrought-iron craft' from those belonging to the essive interpretation: although this DANP can give rise to an ascriptive predication, somehow awkwardly presumably because *art* is a mass noun, it does not pass the test.

(18)   *ferronnerie artistique*
      'artistical wrought-iron craft'

(19)   *ferronnerie (qui) est de l'art*
      '(piece of) wrought-iron craft (which) is art'

(20)   *ferronnerie d'art*
      'artistical wrought-iron craft'

7   Proposed account

(i) When the requirement of semantic similarity between the hd-N and the bse-N is satisfied (cf. examples in Tables 3 or 4), the essive interpretation of N DA is given by rule (21), where P, Q correspond to the parts of meaning relevant to this interpretation for the hd-N and bse-N respectively.

(ii) the **isa** predicate is used although the relationship between the hd-N and bse-N is no always a superordinate relation (in contradistinction to what happens in semantic networks). The formulas and requirements involved in this account are similar to those expressed in the accounts proposed for other types of DAs (Gehrke & McNally, 2015; Arsenijević *et al.*, 2014; McNally & Boleda, 2004).

(21)　$[[\text{N DA}]] = \lambda P_k, \lambda Q_k, \lambda x_k.[\textbf{isa}(x_k, y_k) \wedge \textbf{P}(x_k) \wedge \textbf{Q}(y_k)]$

(22)　a.　$[[\textit{ville}]] \equiv \lambda x_k.[\textbf{town}(x_k)]$

　　　b.　$[[\textit{port}]] \equiv \lambda y_k.[\textbf{port}(y_k)]$

　　　c.　$[[\textit{ville portuaire}]] = \lambda x_k.[\textbf{isa}(x_k, y_k) \wedge \textbf{town}(x_k) \wedge \textbf{port}(y_k)]$

　　　d.　$[[_{Num}[\textit{ville portuaire}]]] = \lambda y_o, \exists x_k, \exists y_k.[\textbf{isa}(x_k, y_k) \wedge \textbf{town}(x_k) \wedge \textbf{port}(y_k) \wedge \textbf{R}(y_o, x_k)]$

In words: if Num = sg: 'The set of atomic tokens which instantiate some kind of town which is (also) a kind of port'. If Num = pl: 'the set of tokens pluralities instantiating some town kind which is (also) a kind of port'.

It should be noted that the essive interpretation can be established on the basis of the semantic information carried by the hd-N and the bse-N, which is an argument against the view according to which the relation they have can be founded only pragmatically.

FIRST DRAFT, COMMENTS WELCOME

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