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Morphosyntactic processes involving body-part nouns in Portuguese

Résumé

Dans cet article, nous examinons systématiquement l'ensemble (formé ?) des noms désignant les parties du corps (cœur, main, tête, etc.) et les mots morphologiquement associés, en particulier les adjectifs, par référence au portugais européen. Nous démontrons que le cadre harrisien général peut être utilisé pour cartographier la plupart des structures syntaxiques impliquant les noms désignant les parties du corps et leurs dérivés (crâne/cranium ‘cranium/crânien’), bien que dans certains cas, en raison de la nature technique de ce vocabulaire, certaines classes d'équivalence ne puissent être établies qu'en invoquant l'origine historiquement déterminée de ces termes (par exemple, coração/cardíaco ‘heart/cardíaco’). L'article rend compte de ces situations et présente certains cas particulièrement difficiles.

Mots-clés : Morphosyntaxe, nom partie-du-corps, adjectif, dérivation, portugais

Abstract

In this paper, we systematically investigate the (closed?) set of body-part nouns (hand, head, heart, etc.) and their related, morphologically associated forms, particularly adjectives, with reference to European Portuguese. We demonstrate that the general Harrisian framework can be used to map most of the syntactic structures involving body-part nouns and their related, derived counterparts (crâne/cranium ‘cranium/crânien’), though in some cases, due to the technical nature of this vocabulary, some equivalence classes can only be established invoking the historically determined origin of the terms (e.g. coração/cardíaco ‘heart/cardíaco’). The paper maps these situations, and shows some particularly difficult cases.

Keywords: Morphosyntax, body-part noun, adjective, derivation, Portuguese

1. Introduction

In this work, we focus on a specific class of nouns, human body-part nouns (from now on Nhp) in (European) Portuguese. This is a finite class of lexical items, that includes both simple (nariz ‘nose’) and compound (palma da mão ‘palm of the hand’) nouns; and also several other morphemic units, entering different word-formation processes, and eruditely derived from Greek (gaster ‘stomach’) or Latin (palma ‘palm’) roots. Besides, the lexicon of Nhp and related vocabulary is composed not only of commonly used designations (mão ‘hand’) but also many specialized technical-scientific terms from Anatomy (tumore ‘tumor’), Physiology (hematopoiesis ‘hematopoiesis’), or general Medical practice (appendicetomía ‘appendectomy’), which are used almost exclusively in those domains. Since it may be considered to be finite, the lexicon of Nhp (and related vocabulary) can be described in

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even if the possessive pronoun sua ‘his/her’ is combined with a definite determiner; the same lack of constraint on the Nbp coreference shown in (1) can also be found (notice that, in Portuguese, possessive pronouns do not agree with the antecedent in gender number, but are adjective like forms that agree with the noun they determine). Therefore, a careful consideration of several, apparently unrelated, syntactic and semantic constraints are in order.

In all these cases, the meronymic relation, if it exists, has to be established between the subject noun phrase and a complement, which are not necessarily contiguous. In the ambiguous sentences (1) and (3), the (meronymic) antecedent of the Nbp with the non-coreferent interpretation j is not even explicit in the sentence, and has to be found in a previous (eventually far away) moment of the discourse.

Several Nbp, especially simple nouns, are ambiguous to their meaning: this is the case of polio(a), which can represent both the Nbp ‘hair(s)’ and a contraction ‘by the; or the case of lebo, ‘a part of the brain’ or a ‘wolf’.

Another issue with Nbp is that these nouns can be used metaphorically: Nbp properly used for animals are commonly used for human Nbp, e.g. forco ‘snout’ instead of face ‘id’. In other cases, the human Nbp is actually metaphorically derived from an animal or vegetal literal meaning, e.g. tranco ‘trunk’ for torso ‘id’. However, one would like to have a part-whole relation be extracted even if these animal or vegetable Nbp are figuratively (and expressively) used instead of the ‘proper’ human Nbp.

(4) Tira as patas de cima do livro! ‘Take your paws from the book’

Furthermore, many idioms involve Nbp, but for the overall meaning of these expressions the part-whole relation is often irrelevant (Baptista et al., 2014).

(5) Maria partiu o coração do Pedro ‘Mary broke Peter’s heart’

In this idiom, the overall meaning (‘be upset’) has little or nothing to do with the denotation of coração ‘heart’, let alone the potential meanings of partir ‘break’. Therefore, even though we may want to consider a part-whole relation between Pedro and coração, this has no bearing on the semantic representation of the sentence, which could be approximated as for a single-verb predicate – an operator, in the sense of Harris (1991): partir o coração (Maria, Pedro). In this case, the semantic relation should not, at least, be considered as an ordinary part-whole relation and should be excluded from the semantic parse.

In some cases, a part-whole relation is only implicit, and Nbp are involved even though they are not mentioned directly. These are the cases that involve indirect (or lexical) reference, where one can consider that Nbp are ‘hidden’ or underlie under certain Nbp-derived words. For example, the names of some medical procedures and diseases, where body-part nouns are involved even though not mentioned directly, are formed with (credit) morphemes directly taken from classical languages (mostly Greek and Latin), like gastrite:

(6) Pedro tem uma gastrite por isso não toma café, que dizem faz mal ao estômago

‘Peter has a gastritis so he doesn’t drink coffee, for [they] say it is bad for the stomach’.

The part-whole relation is not obvious; however, the coherence of the text relies on identifying that relation. The only reason why this sentence is coherent is because there is a relation between gastrite ‘gastritis’ and estômago ‘stomach’. We say that the noun estômago is ‘hidden’ under the noun gastrite, which is an adjective term, directly derived from the Greek root gaster ‘stomach’.

1.2. Related work

The existence of classes of adjectives derived from Nbp was already mentioned for Spanish (Cotena, 2006). In her work, the author produces a semantic classification of adjectives. Thus, she distinguishes adjectives related to physical appearance (toothless, leggy) and diseases (asthmatic, diabetic). However, the author does not distinguish other subclasses of adjectives, like adjectives related to

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1 Non-exhaustive lists of simple and compound Nbp, including many idioms involving Nbp, occurring in the Linguatext corpora have been produced and are now publicly available under Project Esqueleto (Freitas, 2014): http://www.linguatexto.pt/acesso/Linguatexto/esqueleto.html.

2 https://stringatp.dcc.unicamp.br/id-

3 The coreference indices ‘1’ and ‘j’ link the sentence’s constituents, when they refer to the same entity or not, respectively. A word-by-word translation of the examples is provided to highlight the phenomena, and their acceptability is irrelevant.
medical specialties (angiología ‘angiological’, cardiológica ‘cardiological’). Furthermore, the author is not concerned with the morphological derivation of these adjectives, but rather with their semantic taxonomy. To the best of our knowledge, these classes were not systematically studied for Portuguese, except from some brief remarks on adjectives made by Carvalho (2007).

In her work, Carvalho (2007) proposes a classification of human adjectives for Portuguese, that is, adjectives that select human common nouns. The author distinguishes a class of adjectives associated with diseases (arrítico ‘arrhythmic’) or symptomatic manifestations (agosto ‘sick/indisposed’). The author was not concerned with morphological processes involved in the formation of these adjectives (respectively, from arrítico ‘arrhythmic’ and agostra ‘agony’), nor was she addressing the issue of the semantic relation between them (if any). Still, most of the adjectives of this class are neither morphologically nor syntactically related to Nhp.

For a few cases, though, an appropriate Nhp (Harris 1976: 113-115) can be associated to the adjective. By appropriation, Harris (op. cit.) defines a word that has an exceptionally high likelihood of co-occurring with another given word, hence contributing with little or no information to the sentence, being easily zeronable. For example, the subject of arrepiado ‘goosebump-ed’ can either be a human noun or a Nhp like pele ‘skin’ or cabelo ‘hair’:

(O Pedro ficou todo arrepiado ‘Peter has goose bumps’)

A (pelo, os pelos) do Pedro ficou ficou ficou (ficaram) arrepiado ‘Peter’s skin/hair was all goose_bump-ed’

In fact, the special type of meronymy, a.k.a. inalienable possession, triggered by Nhp underlies the syntactic-semantic classification and description of some non-completive verb constructions of French (Boons, Guillet & Leclère, 1976), and has also been adopted for the description of Portuguese verbs (Baptista, 2012). Two main classes were set up, depending on the subject or object position of the Nhp. Besides the meronymic appropriate reduction, illustrated in (8a)-(8b), other syntactic transformations (Baptista 1992, Correia and Baptista 2007) are characteristic of this verbal construction, namely, the dative (8a)-(8c) (Leclère 1955) and the locative NP restructuring (8a)-(8d) (Guillet & Leclère 1981):

(Përo arranhou o pescoço do João ‘Peter clawed the neck of John’)

O Pedro arranhio o João ‘Peter clawed John’

O Pedro arranhou o pescoço do João ‘Peter clawed the neck to John’

O Pedro arranhou o João no pescoço ‘Peter clawed John in the neck’

Baptista (2005) also presents a small list of 39 predicative nouns constructed with support verb ser de ‘be of’. These nouns constitute, for the most part, nominalizations of adjectives, and their main feature is to have as their subject a particularly appropriated Nhp. Hence, corpulence ‘corpulence’ may be associated with corpo ‘body’ as a whole (9), or paladar ‘palate’ to pele ‘skin’ (10).

(O Pedro, o corpo do Pedro) é de uma certa corpulência ‘(Peter, the body of Peter) is of a certain corpulence’

(A Ana, a pele da Ana) é de uma certa paladar ‘(Ana, Ana’s skin) is of a certain palate’

These authors follow closely Meydan (1996) proposals on the particular distributional constraints and transformational properties of adjectival and adjectival constructions involving Nhp. Based on these works, we describe the patterns and morphophonological processes that we found in Portuguese.

The remaining of this paper is structured as follows: In the next section we present the main morphophonological processes involving Nhp, describing the derivation of disease nouns, morphological procedure and medical specializations, and discussing some complex or problematic cases. The paper concludes with general remarks on the phenomena here presented.

2. Morphosyntactic processes with Nhp

By morphosyntactic processes we consider not only the historically constraint word formation processes that yield the current vocabulary of the language, but also rather at discovering the transformational (paraphrastic) relations, in the sense they are conceived in the Harrisonian framework, namely, as syntactic and semantic equivalence relations between sentences. It is clear that many morphological processes involving Nhp result from modern terminological needs and these new terms are produced anew (and recently) by recycling Greek and Latin morphemes or roots. In some cases, the paraphrasic relation can only be considered analogically equivalent to other morphological processes, since the base structures do not exist in a synchronic perspective.

2.1. Diseases

Many nouns designating diseases are obviously related to Nhp, i.e. they derive from the part of the body affected by an illness. Specialized suffixes are used to denote different types of affections. We start with a relatively regular process, to illustrate the morphophonological phenomena and the complexities they may involve.

- Suffix -ite ‘itis’

The suffix -ite ‘itis’ expresses the meaning of inflammation' (or an inflammatory state), and may be attached to a number of Nhp. This is the case of the already mentioned case of gastrite ‘gastritis’ but also of several other nouns: artrite ‘arthritis’, from the Gr. artrhoo ‘joint’; bronquite ‘bronchitis’, from the Lat. bronchus ‘air;’ dermatite ‘dermatitis’, from the Gr. derma ‘skin;’ faringe ‘pharyngitis’, from the Gr. pharynx, phararc ‘throat, pharynx;’ hepatitis ‘hepatitis’, from the Gr. hepar ‘liver;’ otite ‘otitis’, from the Gr. oto ‘ear;’ rinite ‘rhinitis’, from the Gr. rino ‘nose;’ tracheite ‘tracheitis’, from the Lat. trachea ‘air;’ and so forth. Other recent forms can be derived from extant Nhp, without having to resource to classical etymons. For example gangiite ‘gángvitis’ (from gängiva, Lat. for ‘gum tissue’), which was formed upon the Portuguese form gängiva ‘gängiva’.

All these disease nouns are predicative nouns (M. Gross 1981) selecting the support verb ter ‘have’ (durative aspect) or estar com ‘be with’ (more punctual aspect):

(10) O Pedro, tem (está com) (artrite, faringite, gastrite, rinite, ...) ‘Pedro (has, is with) (arthritis, pharyngitis, gastritis, rhinitis, ...)

The derivation of these nouns can be directly linked to the base sentence of inflamação ‘inflammation’, with the same support verbs and having the Nhp as a (locative) complement:

(11) O Pedro, tem (está com) uma inflamação (nas articulações, na faringe, no estômago, na nariz) ‘Pedro (has, is with) an inflammation (in the joints, in the pharynx, in the stomach, in the nose)”

Under the Harrisonian framework, the paraphrasic relation holding between (11) and (12) can be seen as a reduction of the predicative noun inflamação ‘inflammation’ to a suffix -ite ‘ites’. This is a process similar to the transformation called Fission (M. Gross 1981), though here it is not a verb and a complement but a predicative noun and a complement (the predicative noun inflamação and the locative complement with an Nhp) that are involved. In this process, the predicative noun alternates with the suffix -ite ‘ites’, which attaches itself to the Nhp, but the transformation keeps all the information of the base sentence. This explains the high redundancy of the sentences of the Nhp ‘Nhp-ites’ predicative noun (11), when a locative complement em Nhp ‘in Nhp’ is added to it, using the same Nhp or any other different Nhp than the one the Nhp-ite was derived from, as it is shown in (13):

(13) O Pedro (tem, está com) (artrite, faringite, gastrite, rinite, ...) (nas articulações, na faringe, no estômago, na nariz) ‘Pedro (has, is with) (arthritis, pharyngitis, gastritis, rhinitis, ...) (in the joints, in the pharynx, in the stomach, in the nose)
In the first case, with the \text{Nhp-ite} and a locative complement with the same source \text{Nhp}, the sentence is unacceptable for its high redundancy: the \text{Nhp} can not be added for it is already present in a derived form, as a predicative noun \text{Nhp-ite}.

\[ *\text{O Pedro tem uma faringite na faringe'} 'Pedro has a pharyngitis in the pharynx' \]

In the second case, with the \text{Nhp-ite} and a locative complement with a \text{Nhp} different from the source of the derived disease noun:

\[ *\text{O Pedro tem uma faringite no nariz'} 'Pedro has a pharyngitis in the nose' \]

The sentence is also unacceptable since no other \text{Nhp} can be added for the 'argument' position of the sentence's operator, the noun \text{nflamação} 'inflammation' in its reduced form as the suffix -ite 'itis', because that position has already been fulfilled by an form equivalent to a \text{Nhp}, as an erudite morpheme, faringite 'pharynx'.

This is a strong argument to link synchronically - and not just diachronically - the modern \text{Nhp} (e.g. faringite 'pharynx', nariz 'nose') and the erudite equivalent morpheme (e.g. faring(\text{\textdagger}), rib(\text{\textdagger})), irrespective of its formal and historical relation (or lack of), as well as the corresponding sentences, by way of a transformational process, thus also linking the predicative noun \text{nflamação} 'inflammation' and the suffix -ite 'itis'.

On the other hand, the locative complement in (12) hints at this not being a base sentence, particularly because of the contrast meritonomic congruence between the human subject and the locative prepositional phrase:

\[ *\text{O Pedro (cem, está com) uma inflamação nas articulações, na faringe, no estômago, no nariz'} do João' \]

\text{Pedro (has, is with) an inflammation (in the joints, in the pharynx, in the stomach, in the nose) of João'}

Hence, one can posit that (12) may itself not be the base form but the result of a *[locative NP restructurating] (Guillet and Leclère, 1981), and should thus be derived from a sentence like (14):

\[ (14) \text{As articulações, a faringe, o estômago, o nariz'} do Pedro (venem, estão com) uma inflamação' 'Pedro's (joints, pharynx, stomach, nose) has (has, is with) an inflammation' \]

Notice also that all the support verbs (ter 'have' and estar com 'be with', among others) selected by the 'generic' predicative noun \text{nflamação} 'inflammation' are kept in the derived \text{Nhp-ite} construction.

Like M. Grois (1981), we propose these type of paraphrasical relations be described by way of a *[fusion (or fusion-like) transformational process], which reduces the 'generic' predicative noun \text{nflamação} 'inflammation' to a suffix, -ite, binding it to its specialized locative complement with a \text{Nhp}, and yielding a new, equivalent sentence.

It should be noted that this particular physiological process can only manifest itself in certain body organs or tissues. However, we consider that this issue falls outside the linguistic domain proper, as it describes the extra-linguistic nature of the world, its objects and the relations among them. However, though the morphological process is limited to this domain-specific constraints, it can be considered a *[productive process]. Here, productive is being used in the sense that any (knowledgeable enough) speaker would unequivocally interpret a newly coined word derived in such a way. For example, a nonexistent *"angula" from the (formerly known) Latin etymon angula 'naïl' is immediately interpreted as meaning 'an inflammation in the nail(s)' and (irrespective of that specific human tissue being able to undergo the inflammatory process).

The productivity of this morphological process is also attested by the ironic formation of words such as *"preguiçite" 'lazinessitis' and *"tensosite" 'staminaitis', derived from the predicative nouns *"preguiça" 'laziness' and *"tensão" 'tension', respectively. These words are not clear examples of the morphological process described above, as they do not derive from a predicative noun in the same way as *"angula" does from *"angula". Instead, they are examples of *[compounding], where two or more words are combined to form a new word. For example, *"angula" from the (formerly known) Latin etymon angula 'naïl' is immediately interpreted as meaning 'an inflammation in the nail(s)' and (irrespective of that specific human tissue being able to undergo the inflammatory process).

...
with the noun medicamento ‘medicine’ and prefix anti- can be further reduced, by an appropriate zeroing of the head noun, like in (16):

(16) O Pedro tomou um (E - medicamento) anti-gastrico, ‘Peter took a (medicine) anti-gastric’

Finally, let us note the use of these relation adjectives as a human nouns (Carvalho 2007), shown in (17):

(17) As acetomas são particularmente indicadas para gastricos

‘Olivas are particularly suited for gastrics’

This particular nominal use may be derived directly from the base form of the predicative noun NhP tech., illustrated in (18):

(18) Alguem tem gastrite – é (um) gastrico ‘Someone has gastritis = it (a) gastric’

preferably from the sentence with support verb ter ‘have’, due to the durative-permanence aspectual value associated to the de-adjectival noun. Many other human nouns with the -ico suffix, derived from disease nouns and not necessarily associated with NhP (at least in a synchronic perspective) are also observed, e.g. sífilis ‘syphilis’ < sífilis ‘syphilis’, diabético ‘diabetic’ < diabete ‘diabetes’, homofílico ‘hemophilic’ < hemofilia ‘hemophilia’, estrofílico ‘strabismic’ < estrabismo ‘strabismus’, etc.

Turning now our focus to the NLP modeling problem of representing and processing the semantic relations, namely the extraction of meronymic or whole-part relations involved in this processes, it is evident that sentences ter gastrite = ter uma inflamação no estômago should yield the same semantic representation. Hence, in the case of the sentence with the predicative disease noun inflamação ‘inflammation’, this requires the adequate identification of the support verb construction, and should yield the semantic dependency:

\[
\text{WHOLE-PART}(<\text{subject}>,<\text{body-part}>)
\]

like, for example:

\[
\text{WHOLE-PART}(\text{Pedro,estômago})
\]

On the other hand, for the derived predicative noun, such as gastrite ‘gastritis’, etc., the (not always obvious) relation between this noun and the NhP estômago ‘stomach’ must be made available to the system, so that the same dependency can be extracted. Therefore, extensive lists of disease nouns have been produced, for Portuguese, associating each predicative noun with the NhP it is associated with (and eventually derived from), so that the adequate whole-part relation could be extracted. The same type of association is required for adjectives or nominal use of adjectives such as artróico ‘arthritic’.

NhP-ese

Another example of derived disease noun is osteoporose, ‘osteo porous’ (from the Gr. osteon ‘bone’ and poros ‘pore’), which could be said to mean, literally, ‘pores in the bones’. This word form involves the suffix -ose ‘-osis’, taken from the Greek and meaning ‘illness or morbid state’. The base structure of the disease predicative noun is illustrated in the next sentence (19):

(19) O Pedro tem osteoporose ‘Peter has osteoporosis’

Though this is an eruditely derived word form, it could also be associated with a base sentence with the noun poros ‘pores’ and a locative complement with the NhP osso ‘bones’, such as (20):

(20) O Pedro tem poros nos osso ‘Peter has pores in the bones’

We ignore here the fact that NhP is in the plural, and that the singular form exists, but cannot enter a structure like (20):

\*[O Pedro tem um poro no osso ‘Peter has a pore in the bone’ at least not without a particularizing modifier on poro;]

O Pedro tem um poro infectado no osso ‘Peter has an infected pore in the bone’

This last type of sentences have been analyzed before (Laporte, 1997) as complex sentences, involving an operator-verb (M. Gross, 1981) on a adjectival sentence. The analysis starts from:

Um osso tem poros e um desses poros este infectado

‘A bone has pores # one of those pores is infected’

The first sentence is considered to be part of the kernel of language, but from the type of sentences that describe the state of the world, that is, the base information that is involved in the description of sublanguages. It is also responsible for the part-whole relation between poros and osso. On the other hand, the part-whole relation between Pedro and poro seems to be established on the complex sentence after the reduction of the relative:

O Pedro tem um osso tem um poro [que está] infectado

‘Peter has a bone that has a pore that is infected’

The status of poros in this sentence is not clear, as it is a NhP and not a clear-cut predicative noun. In fact, this is not an entirely adequate paraphrase of sentence (19), lacking the specific semantic component that is yielded by the disease noun, which could be located in the suffix -ose ‘-osis’. It could, nevertheless, be taken as the source for the designation (designatio), though not of the actual meaning, since in the process of forming this newly coined word some metaphorical process seems to have taken place. This metaphor can be said to be something like ‘the bones have too much/surge pore like structure as the skin has pores’). A more likely paraphrase would be a sentence like (21):

(21) O Pedro tem uma doença nos ossos! Esta doença caracteriza-se por uma excessiva porosidade dos osso

‘Peter has an illness in the bones’ # ‘This illness is characterized by excessive porosity of bones’

Notice, on one hand, that porosidade ‘porosity’ is clearly a predicative noun, and that it is derived from the NhP poros ‘pores’. This predicative noun selects both the support verb ter ‘have’ and estar com ‘be with’.

Os ossos têm/estão com uma certa porosidade ‘The bones have/are with a certain porosity’

while the verb estar com can not appear in (20):

\*[O Pedro está com poros nos ossos ‘Peter is with pores in the bones’]

In the same way, sentences like:

(22a) Os ossos têm poros ‘The bones have pores’

(22b) Os ossos são porosos ‘The bones are porous’

(22c) Os ossos têm uma determinada porosidade ‘The bones have a certain porosity’

6 www.del-cia.blogspot.pt/2010_01_01_archive.html
The adjectives carotidoclerético 'carotidoclerético' or arterioloclerético 'arterioloclerético' follow the same process described above.

Notice, on the other hand, that the noun aterosclerose 'atherosclerosis', ending with the same disease noun, esclerose 'sclerosis' is formed of ateroma 'atheroma', that is, a lipid formation in the blood vessels. As part of the distributional variation of the subject esclerose 'sclerosis', a similar process should then apply in this case, as ateroma 'atheroma' can also be analyzed as an Nhp.

The observations above could be extended to other suffixed forms, for example Nhp-ia, as in pleurastia 'pleurisy' and derived adjective pleurastico 'pleuritic', an inflammation of the pleura 'id.', miastenia 'myasthenia' (from gr. mias 'muscle' and asthenia 'weakness'). With the necessary adaptations, this could also be an adequate analysis for several compound disease nouns, like câncro do (pele, Nhp, ...) 'cancer of Nhp', for which the derivation seems more straightforward. Some of these compounds may have an erudite alternative designations (e.g. melanoma 'id.', ateroma 'id.', meningioma 'id.', infecção 'lymphoma', apendicite 'id.'), with an erudite underlying Latin or Greek body-part noun as their base.

2.2 Other derivational processes

It would be fruitless to list all the derivational processes that can be found in the language, involving body-part nouns in a more or less direct way. We conclude this section by concentrating some examples (and their related morphemes), which can undergo a similar analysis, based on the paraphrastic relations that can be established between sentences involving Nhp.

Several medical exams and chirurgical procedures are designated by predicative nouns formed on Nhp with suffixes such as -scopia (from Gr. scopos 'see/observe') or -lana (from Gr. ida 'to cut'):

endoscopia 'endoscopy', from endo- 'inter/inside';
lobotomia 'lobotomy', from lobo 'part of the brain';

A similar derivation can be proposed for this type of nouns, involving the predicative nouns observação/imposição 'observation/impediment' and ablação/exclusão 'ablation/exclusion, removal':

O médico fez uma endoscopia ao Pedro 'The doctor made an endoscopy to Pedro'

O médico fez uma inspeção [ao interior do corpo do] o Pedro 'The doctor made an inspection to [the interior of the body of] Pedro'

O médico fez uma lobotomia ao Pedro 'The doctor made a lobotomy to Pedro'

O médico fez a ablação de um lobo (cerebral) ao Pedro 'The doctor made an ablation of a (cerebral) lobe of Pedro'

In Portuguese, the predicative nouns designating medical exams and chirurgical procedures feature two distinct constructions (Dias de Barros 2014): (i) one, with an agentive subject, as in the sentences with médico 'medical doctor' as a subject, illustrated above; this construction selects support verbs such as fazer 'do', realizar 'do', proceder a 'do'; (ii) another one, where the subject is the patient, but the set of support verbs is different, including sofrer 'suffer/undergo':

O Pedro fez/sobreu uma endoscopia/lobotomia 'Pedro did/did underwent an endoscopy/lobotomy'

We do not address here the eventual (transformational) relations between these two support verb and predicative noun constructions. Since verbs like fazer 'do' and realizar 'do' (but not proceder a 'do') can appear in both constructions, without any additional information it is not possible to determine which is being used in the sentence with fazer 'do' above (though a preferential reading may exist).
Notice that, irrespective of this double construction, the same morphosyntactic description, with the necessary adaptations, may apply.

Another interesting class of sentences is the case of the nouns designating professions and medical specialties. One group of suffixes that is used to denote professions and specialties is -isto 'ist' and -ologia 'logia', respectively, the latter formed from Gr. -logia 'knowledge, science'. These suffixes can be attached to a certain number of NpHs. For example, cardiológista 'cardiologist'; cardiológia 'cardiology' (from Gr. καρδία 'heart'). As transformations are non-oriented processes, it may be hard to establish which form may constitute a base sentence, but we reason that the name of the specialty could be a good candidate for such derivation:

P Pedro faz/exerce/pratica cardiologia 'Peter does/exercises/practice cardiology'
= Pedro é um cardiologista 'Peter is a cardiologist'

A hint on for the name of the scientific specialty as the source would be a declarative sentence such as A Cardiologia é a ciência que estuda (as doenças de) o coração 'Cardiology is the science that studies (the illnesses of) the heart' or A cardiology é a especialidade médica que trata (das doenças do) coração 'Cardiology is the medical specialty that deals with (the illnesses of) the heart'. Notice that producing new words by this same process is still very much possible, as the recently related word podologista (variant: podología, from Gr. podos, pod 'foot'), a therapist of the feet diseases, demonstrates.

Besides these suffixes, one finds only some few forms ending in -sitra (-sitra 'psychiatrist', fisiatra and podiatra), their compounds, and the corresponding nouns designating the medical specialty. Considering psiquia- (from Gr. psyche, for 'mind' or 'soul') the base Nph, the origin of the suffix -sitra (for the profession noun) and -sitra (for the medical specialty) is not obvious. The -sitra suffix is considered to be derived from Gr. ψυχέω 'the healer, or the physician'. The prefix pod-., from the Gr. 'child', is not related with Nph and does not belong to our study set, though we expect the derivational process to be similar.

Interestingly, for the paradigm of terapeuta 'therapist', one does not find any professions involving Nph, except perhaps psicoterapeuta and fisioterapeuta.

3. Conclusions

The Harrisian transformational grammar can help to adequately relate the syntactic properties of the Nph-derived predicative nouns like disease nouns to the base sentence, where the syntactic-semantic relations between the disease, the body-part and the human possessor, are all verbally expressed. These paraphrastic relations could apply not only to this particular type of predicate, but also be extended to other classes of words, further structuring the lexicon of the language. All these networks of sentences yield the information conveyed in discourse, and confirm the validity of Harris linguistic-theoretical proposals.

These relations are general in nature (e.g., support verb reduction/variation, etc.), but for these classes of nouns, they have limited lexical coverage and are highly constrained for historical/etymological processes. Therefore, they can only be reasonably considered because of their generality – in the sense that they have been observed with many other types of nouns and predicates.

References
