Head identification in binominal constructions*

Roberto Gomes Camacho and Monielly Cristina Saverio Serafim (São Paolo)

Abstract

Determining the head of complex noun phrases is in general not an easy task in Portuguese. In the case of *uma garrafa de vinho* 'a bottle of wine', in combination with *quebrou-se* 'broke' or *derramou* 'spilled', it is the selection restrictions of the verb that determine which noun functions as head. This paper deals with a specific type of Brazilian Portuguese NP, *aquele idiota do médico* 'that idiot of a doctor', called "binominal" by Aarts (1998). The two types of nominal elements, linked by the preposition *de*, are the first constituent, *idiota* 'idiot', which has an evaluative status, and the second constituent, *médico* 'doctor', which has a referential status. The hypothesis defended here is that the evaluative nature of the first constituent and the referential nature of the second consist in a conclusive criterion for the determination of headedness.

1   Introduction

In the grammatical tradition, the use of the term "head" to capture the linguist's intuitions about what constitutes the most important part of the noun phrase (henceforth NP) implies, in general, a semantic description (Jespersen 1924: 96). This notion of head as the most important idea or primary element is still present in many characterizations of the term (Dik 1997a: 134; Quirk et al. 1985: 60).

The operational tests defined to prove the reliability of this semantic notion of head require, on the one hand, that the head be distributionally equivalent to the whole construction and, on the other hand, that it be the obligatory constituent of the NP (Quirk et al. 1985: 60f.; Zwicky 1985: 11; Huddleston/Pullum 2002: 24). This position allows us to identify, for instance, *car* as the head of an NP like *the blue car*, since it is enabled to replace the NP as a whole, especially in anaphoric reference. However, when dealing with *de*-NPs,[1] a NP that contains two nominal elements linked by the preposition *de* 'of', as in a *uma garrafa de vinho* 'a bottle of wine', the

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[1] Eight different types of noun phrases are understood as *de*-NP: (i) appositions with *de* (*a cidade de São Paulo* 'the city of São Paulo'); (ii) binominals (*o idiota do médico* 'the idiot of a doctor'); (iii) pseudo-partitives (*uma garrafa de vinho* 'a bottle of wine'); (iv) NPs with *sorte/tipo/espécie* (*uma sorte/tipo/espécie de abelha* 'a sort/type/kind of bees'); (v) partitive (*um dos meus amigos* 'one of my friends'); (vi) head-modifier (*os mosaicos de Veneza* 'the mosaics of Venice'); (vii) head-qualifier (*um homem de honra* 'a man of honour'); (viii) head-complement (*a produção de café* 'the production of coffee'). For a detailed definition and analysis of these English NPs, cf. Keizer (2007).

task of defining the head may become complex. To ensure the success of this heuristic proce-
dure, it is possible to employ a third operational test, based on verb selection restrictions
(Akmajian/Lehrer 1976). Consider the examples in (1a–b):

(1)   a.   *Uma garrafa de <u>vinho</u> <u>derramou</u>.*
           'A bottle of <u>wine</u> <u>spilled</u>'.
      b.   *Uma <u>garrafa</u> de vinho <u>quebrou</u>.*
           'A <u>bottle</u> of wine <u>broke</u>'.

If, on the one hand, in (1a) it seems clear that *vinho* 'wine' is the head, on the other hand, in
(1b) it is clearly *garrafa* 'bottle' that heads the NP, so either of the two constituents may figure
as the semantic head depending on the type of entity referred to.

The determination of which element is the head is a question that affects all types of *de*-NPs,
but is especially problematic when it involves a specific subtype of NP, like *aquele idiota do
médico* 'that idiot of a doctor', called "binominal" by Aarts (1998) and Keizer (2007). It should
be noted that all types of *de*-NP are also binominal in principle, since they have a prepositional
link between the two nominal constituents; this designation, however, was restricted to the type
of combination in which one of the nominal constituents has an evaluative nature. The denom-
ination is preserved here because of its consensual meaning in the literature.

The hypothesis defended to elucidate this particular puzzle in Portuguese is that a pragmatic
criterion, related to the evocation of a referent, which occurs through the formulation of a Ref-
erential Subact, and the evaluation of this referent by the speaker through an interpersonal mod-
ifier, are capable to define with a high degree of certainty which constituent constitutes the head
of binominals, based on a complex approach of the NP provided by Hengeveld (2008) and
Hengeveld/Mackenzie (2008). It is expected that other complementary criteria of pragmatic,
semantic and morphosyntactic nature confirm the main hypothesis.

This paper is organized as follows: section 2 deals with the concept of NP from the Functional
Discourse Grammar viewpoint; section 3 gives a pragmatically-based description of binominal
NPs in Portuguese; section 4 shows other complementary criteria for the headedness of binom-
inals; finally, Section 5 takes up the main findings of the analysis and presents some generali-
zations and theoretical implications.

2   The NP in Functional Discourse Grammar

The pragmatic, semantic and morphosyntactic criteria for determining the head of *de*-NPs are
generally inconclusive when taken independently and open to more than one interpretation
(Keizer 2007: 185). As the aim here is to describe an already formally well-delineated construc-
tion, the binominal NP, it is of theoretical relevance to associate our analysis to a functional-
discourse approach to grammar, which, by operating at different levels and layers, provides a
complex treatment of NP. For this reason, the present work adopts the theoretical framework
of Functional Discourse Grammar (henceforth FDG), formulated by Hengeveld/Mackenzie
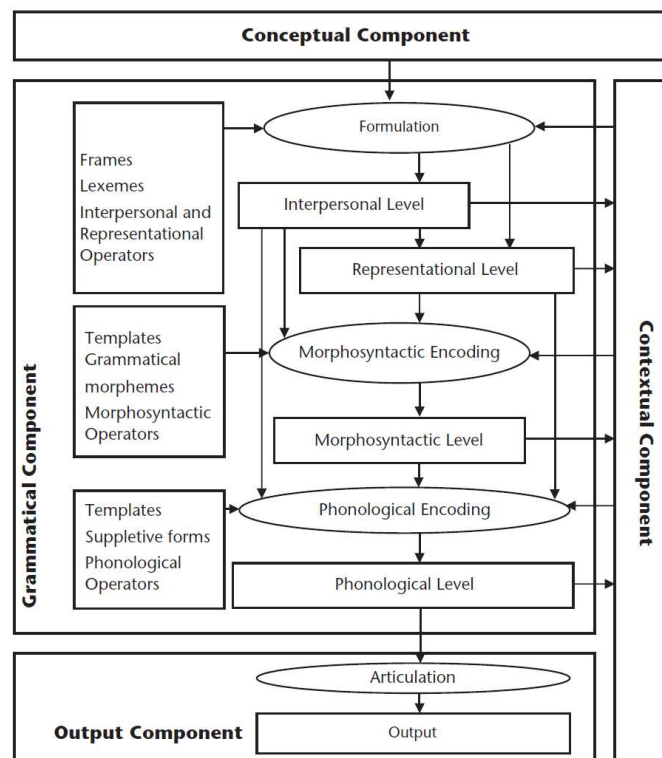(2008), whose general layout is displayed in Figure 1.

Figure 1: General layout of FDG (Hengeveld/Mackenzie 2008: 13)

The FDG consists of a top-down model, which means that the construction of an utterance begins in the Conceptual Component with a communicative intention; then the message moves on to the Grammatical Component, where it is translated into units of pragmatic and semantic content and encoded in formal units of a morphosyntactic and phonological nature.

The Conceptual Component is the driving force of the Grammatical Component since it is responsible for developing both the communicative intention relevant to the ongoing speech interaction and the conceptualizations associated with relevant extralinguistic events. The Output Component generates the acoustic, written or signed utterances based on the information provided by the Grammatical Component. The Contextual Component contains the description of the form and content of the preceding speech, the actual context of the speech event and the social relations between the participants.

The ellipses in Figure 1 represent the Formulation and Encoding operations and the rectangles, the structural levels. The squares on the left contain the primitives, i. e. the building blocks of each level. Every language has such primitives, but each language has its own inventory, so that although all languages contain lexemes, their inventory is different from one to another.

In the Formulation, the message, pre-linguistically constructed in the Conceptual Component, is converted into the primitives of the two higher levels, the Interpersonal and the Representational. A relevant set of primitives is involved with these two levels: Frames define the possible combinations of lexemes – the second set of primitives of these levels – which are, in turn, the content units distinguished by the FDG. Moreover, all levels, including the two highest, make use of Operators, i. e. grammatical elements.

In the Encoding operation, the primitives of the two levels involved in Formulation are converted into primitives of the two lower levels. Thus, morphosyntactic encoding converts units

of pragmatic and semantic content into formal units of a morphosyntactic nature; phonological encoding, on the other hand, converts morphosyntactic units into units of a phonological nature.

Since the notion of language adopted here is that of a non-autonomous system, it is possible to establish a dialogue between language and the more general cognitive faculties. The possibility of this dialogical relationship moves language into the context of human's interaction with their fellows and with wider social contexts. One way of looking at this relationship in the FDG architecture is to fix on the interface between the Conceptual and Grammatical Components and between the latter and the Contextual Component.

Each of the levels within the Grammatical Component has its own structure presented as hierarchically organized layers. The general structure of the layers within the levels is shown in (2).

(2) π v_1: [head (v_1) $_\Phi$]: [σ (v_1) $_\Phi$]) (Hengeveld/Mackenzie 2008:15)

In (2), v_1 represents the variable of a relevant layer of any level, which is constrained by a possibly complex head that takes the variable as its argument and which, in turn, can be optionally constrained by a modifier (σ), be specified by an operator (π) and have a function (Φ). While lexical strategies represent heads and modifiers, grammatical strategies represent operators and functions. A Function is always relational and occurs between units of the same layer, while an Operator specifies a single unit.

Having given an overview of the framework, next let us look at a definition of NP from an FDG perspective.

The study of headedness of the binominals requires looking at the NP from an interpersonal point of view, as units that have an evaluative and a referential role, the latter corresponding, at the Representational Level to the designation of a first-order entity. Figure 2 presents the formalization of the interface between the levels of analysis for a prototypical NP, such as *the intelligent girl*, proposed by Hengeveld (2008).
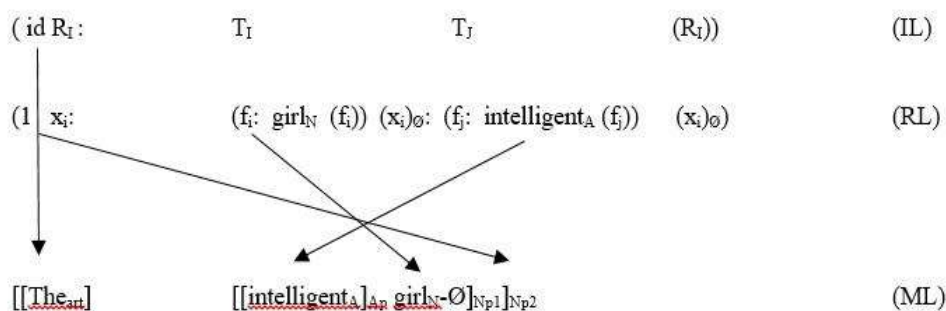

Figure 2: Representation of the standard NP (Hengeveld 2008: 46).

Figure 2 shows that it is the referential status at the Interpersonal Level that identifies the prototypical NP. What represents this pragmatic status at the Interpersonal Level (IL) is the Referential Subact (R_I), which contains, in turn, two instances of Ascriptive Subacts (T_I and T_J). An Ascriptive Subact (T) expresses the evocation of a property that may or may not apply to an entity, while the Referential Subact (R) is responsible for the evocation of a referent. These two Subacts correspond to two Lexical Properties (f_i and f_j), respectively, in terms of denotation at

the Representational Level (RL). At this level, (x_i) indicates that Np_2[2] denotes a first-order entity, *girl*, modified by *intelligent,* which corresponds respectively to the lexical category noun (N) acting as head and to the lexical category adjective (A), acting as modifier.

This information coming from the two higher levels of the Formulation is encoded as an NP at the Morphosyntactic Level (ML), where the adjective in the modifier position precedes the nominal head according to English grammar. It is therefore at the Morphosyntactic Level that the constituent ordering rules apply.

As can be seen, the prototypical NP is a morphosyntactic category that evokes a Subact of Reference at the Interpersonal Level and denotes, at the Representational Level, an Individual (x), a first-order entity that can be located in space and be evaluated in terms of its existence. Formally, the Np_2 has a definite article that encodes at the Morphosyntactic Level the identifiable and specific features of the referent at the Interpersonal Level. The Np_2 also contains the Np_1, constituted by a noun (N), the head, and by an Adjective Phrase (Ap), which is, in the example, represented by the adjective (A) *intelligent*.

It is worth noting that FDG (Hengeveld/Mackenzie 2008) updated the morphosyntactic formalization in Hengeveld (2008) to the one shown in (3).

(3) $(Np_i: [(Gw_i: the (Gw_i)) (Ap_i: (Aw_i: intelligent (Aw_i)) (Ap_i)) (Nw_i: girl (Nw_i))] (Np_i))$

In (3) the Np_i consists of a Grammatical Word (Gw_i) representing the definite article and an Np_j containing, in turn, an Adjectival Word (Aw_i) representing *intelligent*, and a Nominal Word (Nw_i) representing *girl*.

Hengeveld (2008) identifies other types of NP that are not central members of the category. These are non-nominal NPs (*I saw <u>what you did</u>*); non-first order NPs, such as states-of-affairs (the <u>*production of milk*</u>) and propositions (*the <u>belief in change</u>*); NPs with proper nouns and pronouns (<u>*Peter is coming right now/<u>he</u> is coming right now*</u>), which lack denotation at the Representational Level; vocatives (*Hey, <u>girl!</u>*); NPs with *x-incorporated* in languages that contain them; and finally Ascriptive NPs (*Mary is <u>a smart girl)</u>*.

Regarding the modifiers of an NP, Hengeveld (2008) postulates the existence of three possible types: modifiers of subjective attitude (4), modifiers of referent (5) and modifiers of reference (6):

(4)   Oh my god, the **poor** (Σ^R) doctor was going to just tell me the results! (Hengeveld 2008: 49)

(5)   Had I run into the rarest of species, one most people would have thought was extinct in the western world: a **poor**(σ^x) doctor? (Hengeveld 2008: 49)

(6)   A **poor** (σ^f) doctor, dentist or nurse can cause huge harm to a patient in 16 minutes let alone 16 weeks. (Hengeveld 2008: 49).

In (4), the speaker expresses sympathy for the doctor by means of a subjective evaluation modifier. In (5), *poor* restricts the denoted category by specifying entities that are doctors and poor.

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[2] Although we have used the consensual abbreviation NP for Noun Phrase, in the morphosyntactic formalizations based on FDG framework the use of Np is preferred.

In (6), on the other hand, the adjective *poor* as 'incompetent' is assigned not to a specific individual denoted, but to the general property *being a doctor*. These modifiers have different scopes in FDG, as shown in (7), (8) and (9):

(7)   IL: $(R_I: (T_I) (R_I) : poor (R_I))$

(8)   RL: $(x_i: (f_i: doctor (f_i)) (x_i) : (f_j: poor (f_j)) (x_i))$

(9)   RL: $(x_i: (f_i: doctor (f_i) : (f_j: poor (f_j)) (f_i)) (x_i))$

In (7) the scope of the modifier[3] *poor* is the Referential Subact (R), given its clearly interpersonal nature. In (8) and (9), on the other hand, the scope of the modification falls on different layers of the Representational Level: in (8), it falls on the Individual (x) and, in (9), on the property (f), considered a reference by Bolinger (1967).

The next section shows how this model provides methodological tools capable of properly identifying the noun playing the role of the head of the binominal NP.

3   The interpersonal status of the binominal heads

As already mentioned, unlike all types of *de*-NPs, binominals are characterized by containing a nominal element in their first position with an evaluative assessment of the second. As shown in (10) and (11), it allows either negative or positive assessments respectively.

(10)   *Um idiota de um médico.*
       'An idiot of a doctor'.

(11)   *Um anjo de menina.*
       'An angel of a girl'.

Quirk et al. (1985: 1284–1285) postulate that these NPs allow copulative paraphrases in English, which can also be attested in Portuguese, as shown in (12) and (13) respectively.

(12)   O médico é um idiota.
       The doctor is an idiot.

(13)   A menina é um anjo.
       The girl is an angel.

The paraphrases in (12) and (13) show that it is the first noun of binominal NPs that predicates over the second, already showing that the head is the second noun of the NP. From this viewpoint these binominals have the same semantic behaviour as other NPs containing two nominal elements linked by *de* 'of', for instance the head-complement NP in (14); the copulative sentence (14b), formulated as a paraphrase of (14a) represents a State-of-Affairs, as shown by the semantic representation in (14c).

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[3] In FDG, the modifiers at the Interpersonal Level present a particularity in formalization, since they are not assigned to a relevant layer. Thus, the formalization in (7) shows the modifier *poor* related to (R_I) without assigning a layer corresponding to *poor*. At the Representational Level, modifiers are represented as lexical heads of a property, (f_j) in (8–9). It is relevant to note that, in a recent work, Giomi (2020) proposes a new layer for the Interpersonal Level, the layer of Deeds (D), which would allow a formalization in which *poor* appears as lexical head: $(R_I (T_I) (R_I): (D_I: poor (D_I)) (R_I))$. While acknowledging the validity of Giomi's (2020) work, this paper assumes Hengeveld/Mackenzie's view (2008) as illustrated in (7).

(14) a. A tranquilidade do menino
          The peacefulness of the boy.
      b. O menino é tranquilo.
          The boy is peaceful.
      c. RL: $(e_i: [(f^c_i: [(f_i: tranquilidade (f_i)) (x_i: menino (x_i))_{Ref} (f_i))] (f^c_i)) (e_i))$

We read in (14c) that a State-of-Affairs (e_i) has as its head a Configurational Property (f^c_i), semantically filled, in turn, by a Lexical Property (f_i), *tranquilidade* 'peacefulness', ascribed to an individual (x_i), *menino* 'boy', which is an argument of the nominal head playing the function of Reference ($_{Ref}$).

The comparison between binominals and the head-dependent NP in (14a) has the purpose of showing that, although they can be paraphrased as copular sentences, they are in fact not similar constructions. On the one hand, the modifier of the binominal NP allows it to predicate over the referential entity in copular sentences as (12) and (13) due to its pragmatically evaluative nature. On the other hand, the argument of a head-dependent NP as (14a) cannot predicate over an entity in the copular paraphrase in (14b), in fact it is exactly the opposite: the nominal head of the NP in (14a) becomes an adjectival predicate in (14b). Consequently, the heuristic procedure of paraphrase applied to binominal NPs must take into consideration its interpersonal status, whereas the one applied by Quirk et al. (1985) to Configurational Properties such as that in (14a) has a representational status.

The possibility of paraphrasing binominal NPs is due to the lexical properties of the lexemes *idiota* 'idiot' and *anjo* 'angel' in Portuguese, halfway between the denotation of a referential entity, feature ascribed to a noun, and that of a modifier, feature ascribed to an adjective, which corroborates the pragmatically evaluative interpretation of (12) and (13). In other words, it is precisely the ambiguous categorical nature of the nominal elements in Portuguese that allows a modifier of evaluative nature be a noun in binominal NPs, not necessarily an adjective.

However, not all categorically ambiguous constituents of an NP are allowed to occupy the first position of a binominal. See, for instance, the lexeme *politician*: although it can either evoke a referent (15a) or assign a property (15b), it is not allowed in the first position of the binominal NP as shown in (15c). In fact, evaluative modifiers with pejorative content are preferred, such as *analfabeto* 'illiterate' in (15a) and *avarento* 'stingy' in (16a).

(15) a. O analfabeto daquele político.
          The illiterate of that politician.
      b. Aquele homem é um político.
          That man is a politician.
      c. ? Aquele político do analfabeto
          That politician of the illiterate.
(16) a. O avarento do gerente
          The stingy of a manager.
      b. O gerente é avarento.
          The manager is stingy.

It is exactly for this reason that, according to Aarts (1998: 121), the nature of the first constituent of the binominal NP is not only evaluative, but also mostly pejorative. In FDG, they constitute

modifiers of a Referential Subact, in which the speaker's attitude towards some negative feature of the referent evoked by the second constituent stands out. For this reason, the Referential Subact is assigned an Emphasis operator (Emph), which in Portuguese is formally encoded by an intonational prominence at the Phonological Level.

Although the first constituents of binominal NPs are more often pejorative, it is possible to find positive subjective evaluation such as the construction in (11), *um anjo de menina* 'an angel of a girl'. The positive evaluation, based on an essentially metaphorical interpretation, indicates that the NP is derived from the non-metaphorical interpretation of binominal NPs with negative and essentially denotative nature, such as *o avarento do gerente* 'the stingy of a manager'. In fact, Aarts' (1998) restriction can be interpreted more broadly as not applied to lexical items with a pejorative reading, but to neutral lexical items, as *politico* 'politician' in (18b), with no negative or positive reading.

It is possible to find other occurrences of binominal NPs with metaphorical reading, where the first position of the NP reflects the evocation of either a referent or a property at the Interpersonal Level, as illustrated by (17).

(17)   Acorde e deixe seus olhinhos bem abertos. Ou volte a acreditar em duendes (quer dizer, médicos bonzinhos) e depois não se surpreenda se acordar com *uma bela de uma cicatriz* na barriga (Clarissa 2012).
Wake up and keep your eyes wide open. Or go back to believing in leprechauns (I mean, nice doctors) and then don't be surprised if you wake up with *a beauty of a scar* on your belly.

In (17), the evaluative reading, coming directly from an ambiguous lexical item, receives a negative and dysphoric interpretation in (18a–b), which shows its ironic nature.

(18)   a.   ?A cicatriz é bela.
The scar is beautiful.
b.   A cicatriz é feia.
The scar is ugly.

The denotative and more usual meaning of *bela* 'beautiful' implies, however, a positive, euphoric interpretation, as illustrated by (19a) and its copulative reading (19b).

(19)   a.   Uma bela de uma modelo sempre surpreende os fotógrafos.
A beauty of a model (= a beautiful model) always surprises photographers.
b.   A modelo é bela.
The model is beautiful.

The ironic reading of (18a) does not allow a paraphrase with copulative sentence, as shown in (18b), unless the modifier *bela* 'beautiful' is ironically interpreted as "ugly", when applied to the Referential Subact headed by *cicatriz* 'scar'.

As a reinforcement to this characterization, we agree to den Dikken's (2006: 162) proposal, which distinguishes these two types of binominal, identifying them as comparative-qualitative (20a–b) and (21a–b) and as attributive-qualitative (22a–b).

(20) a. Uma joia de cidade.
          A jewel of a city.
      b. A cidade é tão bonita quanto uma joia.
          The city is as beautiful as a jewel.
(21) a. Uma bela de uma cicatriz.
          A beauty of a scar.
      b. A cicatriz é feia.
          The scar is ugly.
(22) a. O idiota do médico.
          The idiot of a doctor.
      b. O médico é idiota.
          The doctor is an idiot.

In both types of binominal NPs, the first element conveys an evaluation regarding a referent, but only (20a) allows a comparative value to be inferred, in that the beauty of the city is compared to that of a jewel; from (22a) it is possible to interpret the binominal NP as a communicative contribution from the Speaker to the Addressee that any inference is based on a negative evaluation without appeal to any comparative parameter.

The binominal NP in (21a–b) is also included in the comparative-qualitative type, but its interpretation implies a more complex degree of connotation, which involves not only a metaphorical reading, as in (20a), but also an ironic reading capable of intensifying the dimension and severity of the injury. In this situation, it is a semantically ambiguous noun that emerges, which allows a typically ironic interpersonal interpretation for the first constituent of the NP. Because of its ironic reading, this type of construction deviates considerably from the most prototypical case of binominal construction.[4]

Although semantically and morphosyntactically acceptable, the positive assessment in the denotative interpretation of (19a), involving the beauty of a model, is not the same as that involving the metaphorical interpretation of (20a), nor the markedly ironic interpretation of (21a) and, for that very reason, especially intensifying the default reading of *bela* 'beauty' in the opposite direction. The interpretation of (21a), *uma bela de uma cicatriz* 'a beauty of a scar', is based on the assumption that it is not common to attribute beauty to a scar; therefore, the Addressee needs to decode the content in another interpretative key, a connotative and markedly ironic modulation through the inference that we are concerned here with an injury of great size and therefore very ugly and serious.

In FDG viewpoint, the construction of the type shown in (19a) and (21a) has a close relation to the order of constituents, which may differ when the modifiers involved belong to different levels. The evaluative and interpersonal meaning of *o pobre médico* 'the poor doctor' (see (4)) and the referential and representational meaning of *o médico pobre* 'the poor doctor' (see (5–6)) is a difference foreseen in the organization into levels and layers postulated by FDG

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[4] An example of using *bela* 'beautiful' as a noun in Portuguese is the title *A Bela e a Fera* for 'The Beauty and the Beast', a traditional French fairy tale (Beaumont [1756] 1982).

(Hengeveld/Mackenzie 2008), which may therefore lead to two categories involved with the analyzed data being one pragmatic and the other semantic.

Indeed, modifiers of the Referential Subact (R^Σ), such as *bela* 'beauty' em *uma bela de uma modelo* 'a beauty of a model' (19a), inherent to Interpersonal Level, activate the elocution of a Discourse Act in which the Speaker expresses her/his attitude towards the evoked referent, which ends up even being ironic as in *uma bela de uma cicatriz* 'a beauty of a scar' (21a). Associated with this reading, there is also the assignment of an Irony operator (IRON) to the Discourse Act, which is encoded at the Phonological Level by a tonal movement together with a stress on a non-focal element, in this case, *bela* 'beauty'. On the other hand, the modifiers of entities (x^σ), such as *bela* 'beautiful' in *a modelo bela* 'a beautiful model' at the Representational Level, specify a property of the entity denoted as a whole, being identified, therefore, as a referent predication in Bolinger's (1967) and Hengeveld's (2008) interpretation.

Along these lines, what *bela* 'beauty' in *uma bela de uma cicatriz* 'a beauty of a scar' has in common with the standard pejorative binominal construction *o idiota do médico* 'the idiot of a doctor' is that the modifier conveys a subjective evaluation with scope over the Referential Subact at the Interpersonal Level.

Compare now the NPs of (23) and (24).

(23)   A droga do cigarro é a nicotina.
        The drug of cigarettes is nicotine.
(24)   A droga do cigarro me queimou o dedo!
        The shit[5] of a cigarette burned my finger!

Although the two instances are provided with homonymous lexical items and the same morphosyntactic organization in Portuguese, the NPs are completely different from each other in their Formulation. Head-modifier NPs, like the one in (23), have their Formulation not derived from the Interpersonal Level, like the binominal NP in (24), but from the Representational Level, where a relation is established between the first-order referential entity (x) *droga* 'drug' and its modifier *cigarro* 'cigarette'. This formulation is morphosyntactically encoded in (25b) as an Np with a Nominal Word (Nw) as head and an Adpositional Phrase (Adp) linked by the preposition *de* 'of' (Gw) indicating alignment between the Representational and Morphosyntactic Levels. See the representation of (23) in (25a, b and c) at the Interpersonal, Representational and Morphosyntactic Levels, respectively.

(25)   a.   IL: (+id + s R_I) (+id + s R_J)
        b.   RL: (x_i: (f_i: droga (f_i)) (x_i) : (f_j cigarro (f_j)) (x_i))
        c.   ML: (Np_i: [(Np_j (Gw_i: a (Gw_i)) (Nw_i: droga (Nw_i)) (Np_j)] [Adp_i: (Gw_j: de (Gw_j)) (Gw_k : o (Gw_k)) (Nw_j: cigarro (Nw_j)) (Adp_i))] (Np_i))

Binominal NPs, on the other hand, have as their head at the Interpersonal Level the referent being evoked, whose correspondence at the Morphosyntactic Level is a constituent placed in

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[5] The word *droga* in this utterance is a euphemistic reading of *merda,* best translated into English as 'shit'. We chose to preserve the form *N of N* in the English translation, however it is also possible to translate it to more common constructions, such as 'the shitty cigarette' or even 'the bloody/frigging cigarette'.

the second position as a Nominal Word (Nw), introduced by the preposition *de* 'of' in an Adpositional Phrase (Adp).

This typical distribution of binominal NPs shows a clear case of mismatch between Formulation and Encoding, more specifically, between the Interpersonal and the Morphosyntactic levels. This lack of alignment implies an inversion of functions: the element introduced by a preposition, which occupies a hierarchically lower position in the NP formal organization, is, in fact, the NP head. In this regard, consider the formal representation of (24) in (26a, b and c) at the Interpersonal, Representational and Morphosyntactic levels, respectively.

(26)   a.   IL: $(R_1: (T_1) (R_1) : droga (R_1))$
       b.   RL: $(x_i: (f_i: cigarro (f_i)) (x_i))$
       c.   ML: $(N_i: [Np_j (Gw_i: a (Gw_i) (Nw_i: droga (Nw_i))] [Adp_i: (Gw_j: de (Gw_j))]$
             $(Gw_k: o (Gw_k)) (Nw_j: cigarro (Nw_j)) (Adp_i))] (Np_i))$

Binominal NPs can be represented at the Interpersonal Level in (26b) as a Referential Subact (R_1), specified by the identifiability (+id) and specificity (+s) operators and modified by *droga* 'shit', which instantiates a subjective evaluation of the Speaker regarding the referent.

The formalization at the Representational Level in (26b) implies that the Subact of Reference in (24) is aligned to a first-order entity (x_i), an individual, and the underlying Ascriptive Subact corresponds to a lexical property (f_i), layer headed by the lexeme *cigarro* 'cigarette'. The modification is not duplicated at this Level: since *droga* 'shit' is a subjective attitude modifier, it should be represented only at the Interpersonal Level without any need to be expressed again at the Representational Level.

The preposition *de* 'of' in binominal NPs, which has no entry at the two higher levels, is encoded at the Morphosyntactic Level (ML) in (26c) as a Grammatical Word (Gw), whose function is linking the two nouns involved. The items corresponding to the identifiability and specificity operators at the Interpersonal Levels are also encoded as Grammatical Words. Furthermore, from a morphosyntactic viewpoint, *a droga do cigarro* 'the shit of a cigarette' is a Noun Phrase (Np_i), which is, in turn, recursively constituted by another Noun Phrase (Np_j) functioning as the head of an Adpositional Phrase (Adp_i) in (26c) with two instances of Noun words, (Nw_i) and (Nw_j), *droga* 'shit' and *cigarro* 'cigarette' respectively.

The first position of an NP in Portuguese is the preferred slot for assigning an evaluative modifier to the nominal head; however, this first position is filled by a Noun Word (Nw) and not by an Adjective Word (Aw) at the Morphosyntactic Level. Therefore, the formal representations in (26a–c) makes it clear that this lack of alignment between the levels of formulation and encoding is the most characteristic feature of binominal NPs in Portuguese.

The sequence of the elements in a head-modifier construction, like *a droga do cigarro* 'the drug of the cigarette' in (23), shows perfect alignment between the Representational and the Morphosyntactic Level, as shown in (25a–c). This type of construction may be considered the cognitive basis for deriving more complex types of NPs attached to the FDG's Conceptual Component. It is this cognitive basis for derivation that opens the grammatical possibility for the Speaker to activate the more complex formal structure of the binomial type reflecting the inser-

tion of modifier with lexical input at the Interpersonal Level. This interpersonal modifier assigns an evaluative reading to the first element of the Referential Subact in a Discourse Act with exclamatory illocution, as in (26). This second type of *de*-NP has a degree of complexity higher than that of head-modifier specified in (23), just for encoding the pragmatically determined head as a preposition-governed Nominal Word (Nw) into an Adpositional Phrase (Adp) slot at the Morphosyntactic Level.

Therefore, two types of mismatch can be seen between constructions (23) and (24): a semantic-pragmatic and a morphosyntactic one. The referential element in (24), *cigarro* 'cigarette', playing simultaneously the function of NP head, is in fact a modifier in (23) governed by the preposition *de* 'of'; in (24), the original head element of (23), *droga* 'drug' takes on the function of a pragmatic evaluative modifier preferably interpreted as "shit". The simultaneous referential and evaluative nature of binominal constructions is possibly the key to the cognitive processing of this mismatch and consequently the grammatical allowance for this type of construction.

Where the morphosyntactic constitution of the NPs is identical, as seen in in (23) and (24), the phonological encoding assumes the task of establishing the difference between them. In many languages, including Portuguese, emphasis can be iconically expressed by means of an extra-intonational prominence (Hengeveld/Mackenzie 2008: 441). The resulting effect is the assignment of both a rising operator to the Intonational Phrase (IP) and an additional reinforcement in the stressed syllable of the Phonological Phrase (PP) involved (*droga*), as shown in (27), a phenomenon that does not apply in the same way to a Head-Modifier type of *de*-NP like the one in (23).

(27)   A droga do cigarro
        IL: (emph R_1: (T_1) (R_1) : droga (R_1))
        PL: (rIP$_i$: (rPP$_i$ / a'drɔgadusi'gaRʊ/ (PP$_i$) (IP$_i$))

The formal representation given in (27) shows that the Emphasis Operator at the Interpersonal Level (IL) is encoded, at the Phonological Level (PL), by an Intonational Phrase (IP) with a rising pitch operator (r), reinforced by a stronger stress on the tonic syllable of /'drɔga/ transcribed as /ɔ / in the Phonological Phrase (PP). This use of both intonational reinforcement and stress shows that grammar is always able to provide a difference of pragmatic and/or semantic formulation with an adequate formal encoding; in the specific case of the *de*-NPs shown in (23) and (24), it is the Phonological Level that counterweighs the absence of a distinguishing morphosyntactic encoding in the Portuguese grammar.

The path of analysis covered so far had the clear aim of demonstrating how the interpersonal and morphosyntactically complex character of the binomial NP is dealt with within FDG. In the next section, we will see how the interpersonal status of binominal NPs is confirmed by applying other semantic and morphosyntactic criteria for head identification.

4   Complementary criteria for head identification

In prototypical binominal NP, it is the subjective evaluation nature of the first noun that already points to its status as a modifier and not as a true head, a function reserved to the second noun, which also has the task of providing the NP reference and introducing the focal or topical entity.

The entity in a binominal construction is often not completely new: when referring to a person as *aquele/este/o idiota do médico* 'that/this/the idiot of a doctor', the Speaker identifies the referent mentioned as a cognitively accessible entity; as such, it should be already retrieved in the Addressee's mental state. Alternatively, the reference to a person by means of a construction as *um idiota de um médico* '*an idiot of a doctor*' implies introducing a new entity into the discursive flow, which motivates the Addressee to construct an entity in her/his mental state. Furthermore, the Referential Subact involving the use of a binominal NP may evoke a non-specific entity, as illustrated in (28).

(28)   Estou esperando <u>um idiota de um médico</u> que venha me atender.
       I'm waiting for <u>an idiot of a doctor </u>who comes to see me.

In dealing with Referential Subacts, Hengeveld/Mackenzie (2008) warn about the need for a theoretical distinction previously postulated by Dik (1997a: 130) between the construction and the identification of a referent. The first case concerns the situation where the Speaker expects the referent evoked by her/him to be introduced into the Addressee's mental state; the second case concerns the situation where the Speaker instructs the Addressee to simply identify a referent already cognitively available; an entity, therefore, not completely new.

So, the issue of identifiability can be viewed from two perspectives. "The first concerns the Speaker's assumptions about the identifiability of the referent for the Addressee: this will be reflected in operators {+id, -id} for identifiable and non-identifiable respectively. The second concerns the Speaker's indication of the identifiability of the referent for him/herself; this will be reflected in the operators {+s, -s} for specific and non-specific respectively" (Hengeveld/Mackenzie 2008: 122).

The binominal NP in (28) *um idiota de um médico* 'an idiot of a doctor', said when waiting impatiently for medical assistance in an emergency room of a hospital, indicates that the Speaker knows that a doctor is going to attend to him, but is unaware of his specific identity; Portuguese grammar encodes this lack of specificity by the use of a Grammatical Word (Gw) at the Morphosyntactic Level.

These pragmatic distinctions involving identifiability and specificity further shed light on the inference that the Nominal Word (Nw) of the Adpositional Phrase (Adp) is the head of the Np as a whole. On the one hand, when what is involved is the process of constructing a reference, as illustrated with *um idiota de <u>um medico</u>* 'an idiot of a doctor', the respective Referential Subact consists of evoking a non-identifiable entity for both participants; on the other hand, when what is involved is the process of identifying the reference, which is illustrated by the construction *aquele/este/o idiota do médico* 'that/this/the idiota of a doctor', the only task of the Addressee is simply recovering the evoked referent, *doctor*, in order to agree or disagree with the evaluation attitude modifier uttered by the Speaker in the ongoing discourse.

Let us now turn to the Representational Level, from where the semantic motivations of head-edness emerge based on the obligatoriness or possible omission of one of the constituents and on the selection restrictions of the verb.

As already seen, attributive-qualitative binominal constructions are characterized by a pragmatic relation in which the first nominal element acts as a pragmatic modifier with scope over

the second, a Referential Subact at the Interpersonal Level; therefore, in most cases, the semantic criteria of obligatoriness, omission and selection restriction are only available for the second element of the NP, as shown by the constructions contained in (29a–c).

(29) a. A única eleição majoritária que tinha na ditadura era pro senado. E o MDB fez 16 senadores, e *aquele louco do Sebastião Nery* escreveu "As 16 derrotas que abalaram a ditadura" (Collares 2011).
The only majoritarian election in the dictatorship was for the Senate. And the MDB elected 16 senators, and *that crazy Sebastião Nery* wrote "The 16 defeats that shook the dictatorship".

      b. A única eleição majoritária que tinha na ditadura era pro senado. E o MDB fez 16 senadores, e *aquele louco* escreveu "As 16 derrotas que abalaram a ditadura".
The only majoritarian election in the dictatorship was for the Senate. And the MDB elected 16 senators, and *that crazy* wrote "The 16 defeats that shook the dictatorship".

      c. A única eleição majoritária que tinha na ditadura era pro senado. E o MDB fez 16 senadores, e *o Sebastião Nery* escreveu "As 16 derrotas que abalaram a ditadura".
The only majoritarian election in the dictatorship was for the Senate. And the MDB elected 16 senators, and *Sebastião Nery* wrote "The 16 defeats that shook the dictatorship".

At first sight, it is possible to replace the NP as a whole by any of its two nominal constituents; however, in situations where the referent is introduced into the discursive flow, a case of reference construction, only the second noun can be a single nominal constituent. In addition, the evaluative element alone is not able of sustaining the reference, unless the situation involved is one of a textual reiteration by a lexical device. In this case, the referential element plays the role of a noun, insofar as it is provided with a description by means of which an entity may be designated. Let us see in this regard the examples contained in (30a–b).

(30) a. A única eleição majoritária que tinha na ditadura era pro senado. E o MDB fez 16 senadores, e <u>Sebastião Nery</u> escreveu "As 16 derrotas que abalaram a ditadura" (Collares 2011)
The only majoritarian election in the dictatorship was for the Senate. And the MDB elected 16 senators, and <u>Sebastião Nery</u> wrote "The 16 defeats that shook the dictatorship".

      b. A única eleição majoritária que tinha na ditadura era pro senado. E o MDB fez 16 senadores, e <u>aquele louco</u> escreveu "As 16 derrotas que abalaram a ditadura".
The only majoritarian election in the dictatorship was for the Senate. And the MDB elected 16 senators, and <u>that crazy </u>wrote "The 16 defeats that shook the dictatorship".

It is perfectly possible to identify *Sebastião Nery'*s reference (29a) without the interpersonal modifier *aquele louco* 'that crazy', but the opposite is not allowed in the same context. A possible condition would be a situation of textual reiteration, as in (30b), in which it is sufficiently clear that *aquele louco* 'that crazy' recovers *Sebastião Nery*. However, as far as (31a–b) is concerned, the inverse is not true.

(31) a. <u>O jornalista Sebastião Nery</u> é o pai do folclore político brasileiro. A única eleição majoritária que tinha na ditadura era pro senado. E o MDB fez 16 senadores, e *aquele louco* escreveu "As 16 derrotas que abalaram a ditadura".
The <u>journalist Sebastião Nery</u> is the father of Brazilian political folklore. The only majoritarian election in the dictatorship was for the Senate. And the MDB elected 16 senators, and *that crazy* wrote "The 16 defeats that shook the dictatorship".

   b. <u>? Aquele louco</u> é o pai do folclore político brasileiro. A única eleição majoritária que tinha na ditadura era pro senado. E o MDB fez 16 senadores, e <u>o jornalista Sebastião Nery</u> escreveu "As 16 derrotas que abalaram a ditadura".
<u>That crazy</u> is the father of Brazilian political folklore. The only majoritarian election in the dictatorship was for the Senate. And the MDB elected 16 senators, and the <u>journalist Sebastião Nery</u> wrote "The 16 defeats that shook the dictatorship".

As seen, the Referential Subact introduces new entities into the discourse flow. In (31b) *aquele louco* 'that crazy' does refer, but it is not a felicitous reference, especially because it does not allow the referent limited to the evaluative element to be identifiable to the Addressee. This is because *aquele louco* 'that crazy' should establish an anaphoric reference to a referent already mentioned in the previous discursive context, that is, it needs to be anchored to a previous referent.

The textual criterion of referentiality requires, in turn, the determination of which constituent of the NP can be reiterated by anaphoric pronominalization, which implies examining the interface between the Contextual Component and Representational Level of the FDG Grammatical Component. "Although the part-of-speech 'noun' is closely associated with Reference, not every occurrence of a noun involves a Subact of Reference" (Hengeveld/Mackenzie 2008: 114). The authors postulate a test of referentiality to check whether the Speaker can anaphorically refer to a Referential Subact, as in (32).

(32) a. I have lost *my dog*. *He* has a curly tail
   b. I want to have *a cat*. *I<u>t</u>* doesn't have to be beautiful.
   c. I went to work by bus. *<u>It</u> (the work) was boring. *<u>It</u> (the bus) broke down.

<div align="right">(Hengeveld/Mackenzie 2008: 114)</div>

According to the authors, the nouns *work* and *bus* in (32c) do not express Referential Subacts but the Adpositional Phrases as a whole, *to work* and *from bus,* really do. A test to prove the referentiality of the phrases is the possibility of asking where the Speaker went (to work) and how they went to work (by bus).

The anaphoric reference by means of another lexical item in the ongoing discourse appears to be irrelevant to whether the noun is either a modifier, as in (33b), or a Referential Subact, as in (33c), defined as an attributive-qualitative construction.

(33) a. E mais do que isso: *o safado do coronel Golbery* [...] perdeu uma eleição. (Collares 2011).
And more than that: *the rascal of Colonel Golbery* [...] lost an election.

   b. *O safado* era chefe da Casa Civil nos governos de Orlando Geisel e João Figueiredo.

The rascal was head of the Civil House in the governments of Orlando Geisel and João Figueiredo.

    c.   *O coronel Golbery* era chefe da Casa Civil nos governos de Orlando Geisel e João Figueiredo.

Colonel Golbery was head of the Civil House in the governments of Orlando Geisel and João Figueiredo.

The attributive-comparative type, however, such as the one contained in (17), here repeated for convenience as (34a), only admits the resumption of the referential entity *cicatriz* 'scar', as in (34b), because it is the only lexical item which can be assigned to the function of Topic in the following text and never the modifier *bela* 'beauty', as in (34c).

(34)   a.   Acorde e deixe seus olhinhos bem abertos. Ou volte a acreditar em duendes (quer dizer, médicos bonzinhos) e depois não se surpreenda se acordar com *uma bela de uma cicatriz* na barriga (Clarissa 2012).

          Wake up and keep your eyes wide open. Or go back to believing in leprechauns (I mean, good doctors) and then don't be surprised if you wake up with *a beauty of a scar* on your belly.

   b.   E essa *cicatriz* poderia ser evitada com um parto normal.

          And that *scar* could be avoided with a normal birth.

   c.   * E essa *bela* poderia ser evitada com um parto normal.

          * And that *beauty* could be avoided with a normal birth

The anaphoric reiteration establishes a relation with the entity evoked in the Referential Subact or with the evaluative modifier only when the attributive-qualitative type of binominal construction is involved. As for the comparative-qualitative type, it is only the Referential Subact that grants reiteration.

The type of reiteration shown in (35a–c) demands gender and number agreement in Portuguese, extending the analysis to the morphosyntactic encoding. First, let us see reiteration linked to gender agreement.

(35)   a.   Nós contratamos <u>um idiota</u> (de <u>encanador$_i$)</u> para reformar o banheiro e <u>ele$_i$</u> deixou um monte de vazamentos.

          We hired <u>an idiot</u> (of a <u>plumber)</u> to restore the bathroom and <u>he</u> left a lot of leaks.

   b.   Aquele <u>tesouro de menina$_i$</u> só nos dá alegria. <u>Ela$_i$</u> tirou nota máxima em física.

          That <u>treasure (masc) of a girl$_i$ (fem)</u> gives us nothing but joy. She$_i$ got top marks in Physics.

   c.   Aquele <u>tesouro$_i$ de menina</u> só nos dá alegria. ?Ele$_i$ tirou nota máxima em física.

          That <u>treasure$_i$ of a girl</u> gives us nothing but joy. ?It$_i$ got top marks in Physics.

Now let's see number agreement. This formal criterion is applicable only when the binomial NP occupies the subject position, as shown in (36b), where both constituents are inflected in plural.

(36)   a.   O inútil do segurança não viu o roubo acontecer.

          The useless security guard didn't see the robbery happen.

b.   Os inúteis dos seguranças não viram o roubo acontecer.
     The useless security guards didn't see the robbery happen.

Considering that the singular inflection marks the number in all occurrences examined, the morphosyntactic testing of number agreement is not operational to determine headedness. The examples in (36) show that the possibility of number inflection, either singular or plural, involves both nominal elements thus providing a clear evidence that the application of the verbal agreement criterion has low degree of relevance.

5   Conclusion

It is not a trivial task to point out the head of constructions with two nominal elements linked by the preposition *de* 'of' in Portuguese. Taking this difficulty as a theoretical challenge, the aim of this work was to identify, with a high degree of descriptive specificity, both the semantic-pragmatic types of binominal NPs based on the relationship between their constituents and which constituent plays the head role in the morphosyntactic encoding.

Initially dealing with semantic-pragmatic identity and following den Dikken (2006), the descriptive task led us to the identification of two types of binominal constructions in Portuguese, the attributive-qualitative and the comparative-qualitative. Although the second type always has a connotative reading, which, therefore, makes it cognitively more complex than the first, it presents head restrictions clearer than the attributive-qualitative type. Moreover, the connotative nature of the comparative-qualitative type leads it to a higher degree of cognitive complexity by means of a remarkably ironic reading.

Table 1 schematically compares the Configuration Property[6] with these three types of binominal NPs, from which different degrees of cognitive complexity stand out.

Construction$_1$	Construction$_2$	Construction$_3$	Construction$_4$
Configurational Property	Attributive-qualitative	Comparative-qualitative	Comparative-qualitative
A tranquilidade do menino 'The peacefulness of the boy'	*O idiota do médico* 'the idiot of a doctor'	*Um anjo de menina* 'an angel of a girl'	*Uma bela de uma cicatriz* 'a beauty of a scar'

Table 1: binominal NP types in comparison with the Configurational Property

It is worth recalling that Quirk et al. (1985: 1284f.) postulate that binominal NPs allow paraphrases with copulative sentences: *the doctor is an idiot* for *an idiot of a doctor*; consequently, binominal NPs undergo the same semantic restrictions as paraphrases of copulative sentences for common non-binominal NPs such as Construction$_1$. This relationship gave us a piece of evidence that it is Configurational Properties that constitute the cognitive starting point for more complex NPs of an evaluative nature. So, Construction^4 diverges from Construction$_1$ to a maximum degree, thus ruling out even the possibility of paraphrase with the copulative sentence. It is therefore reasonable to argue that Construction$_1$ is naturally transferred onto construction$_2$,

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[6] A Configurational Property is "a combination of semantic units that are not in a hierarchical relationship with respect to each other, including, again, Properties (f2), Individuals (x), Locations (l), Times (t), etc. " (Hengeveld/ Mackenzie 2008: 139).

due to its denotative content, while construction₃ manifests a connotative reading and construction₄, a connotative and ironic reading.

Reflecting now on the issue of headedness, we examined how the literature has treated heuristic procedures for us to make the methodological decision to apply criteria of different nature in discussing the data, each one targeting a particular level of analysis provided by the FDG theoretical framework (Hengeveld/Mackenzie 2008).

Following the top-down orientation, we started at the Interpersonal Level, where the data discussed allowed us to confirm the initial hypothesis that the evaluative nature of the first constituent of the NP and the referential nature of the second one end up constituting conclusive criteria by themselves for determining the headedness of binominal constructions. In this case, the Nominal Word functioning as the head of the Adpositional Phrase at the Morphosyntactic Level corresponds to the one that is responsible for pragmatic processes of constructing and identifying reference at the Interpersonal Level.

Continuing the downward path in the FDG formulation process, the next stop was precisely at the Representational Level, to examine whether one of the two constituents has the referential status of an entity (x) and, as such, not susceptible to omission. The descriptive procedure applied has proved to make no difference whether either the first or the second constituent of NP is the omissible element in constructions with denotative content; however, when the construction involved is provided with metaphorical meaning, the verb selection constraints allowed us to identify the second constituent of NP and not the first as the head.

Still within the Representational Level, it was necessary to check which constituent of the binomial NP activates reiteration by anaphoric pronominalization or via lexical items, a process also determined by devices derived from FDG Contextual Component. Data analysis confirmed that the second constituent of the NP licenses the reiteration in both types of textual devices, thus validating the status of the second constituent as a head element as well.

It is feasible to replace the NP by either of the two nominal constituents in lexical reiteration processes. However, the apparent possibility of replacement does not imply that the first constituent corresponding to a subjective attitude modifier at the Interpersonal Level in principle is able to sustain by itself the NP reference, a task performed by the second constituent, which is also where the lexical resumption of binominal NPs of the attributive-comparative type is housed.

References

Aarts, Bas (1998): "English binominal noun phrases". *Transactions of the Philological Society* 96: 117–158.

Akmajian, Adrian/Lehrer, Adrianne. (1976): "NP-like quantifiers and the problem of determining the head of an NP". *Linguistic Analysis* 2/4: 395–413.

Beaumont, Jeanne-Marie Le Prince de (1756/1982): "A Bela e a Fera". *Coleção Fábulas Encantadas*. São Paulo: Abril S. A. Cultural e Industrial.

Bolinger, Dwight (1967): "Adjectives in English: attribution and predication". *Lingua* 18: 1–34.

Clarissa (2012): "Quer dizer que você quer parto normal?". *A mãe que quero ser*. amaequequeroser.wordpress.com/2012/03/29/quer-dizer-que-voce-quer-parto-normal/ [21.07.2021]

Collares, Alceu de Deus (2011): "Alceu Collares: 'Vem aí uma revolução. Mas não há quem lidere as massas'". Sul 21. sul21.com.br/noticiasultimas-noticiaspolitica/2011/05/alceu-collares-vem-ai-uma-revolucao-mas-nao-ha-quem-lidere-as-massas/ [21.07.2021]

Dikken, Marcel den (2006): *Relators and linkers*: the syntax of predication, predicate inversion, and copulas. Cambridge, MA: MIT Press.

Giomi, Riccardo (2020): *Shifting structures, contexts and meanings. A Functional Discourse Grammar account of grammaticalization*. Lisboa: Universidade de Lisboa, Faculdade de Letras.

Hengeveld, Kees (2008): "Prototypical and non-prototypical noun phrases in Functional Discourse Grammar". In: Rijkhoff, Jan/Velasco, Daniel Garcia (eds.): *The Noun Phrase in Functional Discourse Grammar*. Berlin, Mouton de Gruyter: 43–62.

Hengeveld, Kees/Mackenzie, J. Lachlan (2008): *Functional Discourse Grammar*: a typologically-based theory of language structure. Oxford: Oxford University Press.

Huddleston, Rodney/Pullum, Geoffrey K (2002): *The Cambridge Grammar of the English language*. Cambridge: Cambridge University Press.

Jespersen, Otto (1924): *Philosophy of grammar*. London: George Allen and Unwin.

Keizer, Evelien (2007): *The English Noun Phrase*. Cambridge: Cambridge University Press.

Quirk, Randolph S. et al. (1985): *A comprehensive grammar of the English language*. London: Longman.

Zwicky, Arnold (1985): "Heads". *Journal of Linguistics* 21/1: 1–29.