ORIGINAL ARTICLE

IDENTIFYING ADJECTIVES IN KARITIANA BY THE USE OF SEMANTIC CRITERIA

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▪ ABSTRACT: The aim of this paper is to discuss criteria for identifying adjectives in natural languages using the language Karitiana (Arikén, Tupi) as an example. Firstly, the most traditional syntactic criteria used in the literature by descriptivists and typologists are discussed (DIXON, 1991, 2004). Despite the importance of these criteria as a first approximation of the phenomenon of predication in natural languages, they have certain limitations for the identification of adjectives in languages in which this word class appears in sentences with the same inflection found in intransitive verbs, as in Karitiana. Therefore, some semantic criteria are presented for the characterization of adjectives based on the notion of scalar properties (KENNEDY, 1999; KENNEDY; MCNALLY, 2005). These criteria are used to discuss not only the adjectives class, but also the typology of natural language intensifiers (NEELEMAN; VAN DE KOOT; DOETJES, 2004; DOETJES, 2008). Especially in Karitiana, the distribution and behavior of the modifier *pita(t)* 'very/a lot' (described in SANCHEZ-MENDES, 2014a) proved to be fundamental in helping to identify adjectives.

▪ KEY-WORDS: Linguistic Typology; adjectives; syntax; semantics; indigenous languages.

Adjectives: an exclusive word class

Stating that the class of adjectives presents challenges for the establishment of criteria for its identification is almost a triviality of grammatical studies. Dixon (2004), retracing the historical route of this classification in linguistic studies, pointed out that, historically, neither the Sanskrit grammar of Panini nor the classical Greek and Latin grammars have well distinguished the classes of nouns and adjectives. It was only in the 14th century, with Thomas of Erfurt, that this distinction was drawn based on the gender criterion. Unlike nouns, adjectives have no inherent gender, but can acquire it by agreement. This definition based on the properties of the Latin languages became a distinctive criterion used until the 20th century. Jespersen (1924), for instance, considers that gender is the only criterion that would exclusively separate adjectives from nouns.

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According to his proposal, since Finnish does not express gender, it would not have a class of adjectives distinct from the nouns. Indeed, it comes from this tradition the use of the nomenclature *nominals* to convey both nouns and adjectives.

According to Dixon (2004), the fact that modern linguistics has focused on the study of European languages by scholars who speak European languages has influenced the usual consideration that adjectives form a class that is confused with nouns. More recently, however, it is recognized that many languages have adjectives with morphological characteristics of verbs, which can even act as intransitive verbs.

In current linguistic studies, adjectives are understood as a kind of mixed class of nouns and verbs properties. From the Generative Linguistics perspective, for instance, the lexical category of adjectives is defined by the combination of two positive features: (+N) nominal and (+V) verbal. This mixed character is precisely what explains the fact that, in many languages, adjectives have grammatical properties identical to those of nouns, but in others, they are indistinguishable from verbal predicates.

Despite this similarity - or even indiscernibility with other classes - Dixon (2004) states that there is always some grammatical criterion capable of distinguishing adjectives from other classes, even if it is subtle. This paper follows this assumption and discusses syntactic and semantic criteria for the characterization of adjectives in Karitiana (Arikén, Tupi), a language spoken in Rondônia, Brazil. I must clarify, however, that this proposal is not completely consensual, since it was rejected by Dixon himself in previous works (DIXON, 1982). For more examples of works that argue that adjectives do not form an exclusive class, see, for instance, Van Den Berg (1989) for Muna (Austronesias, Indonesia) and McCawley (1992) for Mandarin Chinese.[1]

In order to present the paths of identifying criteria for distinguishing adjectives in Karitiana, this paper is organized as follows: in the next section, I present the traditional criteria for identifying the class of adjectives proposed by typologists in languages of different families; then, these criteria are discussed taking into account the data from Karitiana; the next section introduces semantic criteria for the characterization of adjectives based on the notion of scalar properties; the later section articulates this proposal with the properties of Karitiana; the last section presents the final remarks. In this paper, I will focus the discussion on the criteria addressed only for non-derivative terms, leaving aside cases like adjectives derived from nouns.

Syntactic Criteria for Identifying Adjectives

Assuming that all languages have nouns, verbs and adjectives, this section presents syntactic criteria for distinguishing adjectives from the classes of nouns and verbs that have been discussed in languages of different families. The first important observation is that it makes no sense to propose purely semantic-referential criteria as the basis for

[1] For a more recent discussion, see Stoll, Abott-Smith e Leiven (2009).

the classification of words since a concept can be expressed by different word classes in different languages. For instance, the notion of 'needing to eat' is expressed by a noun in English (*hunger*), an adjective in Dyirbal (Pama-nyungan, Australia) (*ŋamir*) and by a verb in Latin (*ēsŭrĭo*). Even the terms *mother* and *father*, which are usually expressed by nouns in the best-known languages in the West, are expressed by verbs such as 'being a mother / father of' in the Yuman languages (spoken in California) (DIXON, 2004).

Although this two-way correspondence cannot be supported in all cases, Dixon (1991, 2004) presents a generalization about semantic types prototypically associated with certain specific grammatical classes. According to his proposal, nouns include concrete reference names such as *cat* and *stone* and verbs include names for action, such as *cutting* and *speaking*. Typically, adjectives express the following notions in languages:

(i) dimension (*small*, *large*);
(ii) age (*old*, *new*);
(iii) value (*good*, *bad*); and
(iv) color (*black*, *white*).

Other properties usually expressed by adjectives are:

(i) physical property (*heavy*, *wet*);
(ii) human predisposition (*happy*, *smart*); and
(iii) speed (*fast*, *slow*).

Although this generalization holds for many languages, a classification that focuses only on criteria of this type is not enough. Therefore, linguistic studies traditionally established syntactic criteria for word classification. Nouns, for example, are words that are heads of noun phrases while verbs are heads of verbal phrases. However, taking these properties into account, the class of adjectives is not as simple to characterize, since it has mixed properties as it was pointed out before. Adjectives can be used both to specify a referent within a noun phrase, as in (1a) and to declare a property (1b). Most languages have adjectives that can do both.[2]

(1) a. The tall man smiled.
    b. Peter is tall.

When adjectives are used in constructions like (1a), they can assume, in some languages, a typical inflection of nouns. This is the case of Portuguese, for instance. Making changes on the head of the noun phrase in gender and number also varies the

[2] For adjectives that have restrictions related to these two functions, see, for example, Bolinger (1967) and Cinque (2010).

adjective: *mulher alta* (woman tall-FEM), mulheres altas (woman-PL tall-FEM-PL), homens altos (man-PL tall-MASC-PL). In morphological case languages, such as Latin, adjectives also agree to their nouns in case. In these types of languages, then, adjectives tend to be confused with nouns. For Dixon (2004), these are languages that have noun-like adjectives.

However, as adjectives are also used to assert properties, as in (1b), there are other languages in which this class is confused with verbs. In these languages, adjectives do not appear with a copula verb, as in English in (1b), but assume the typical inflections of intransitive verbs (such as time, mood and aspect). These are the languages with verb-like adjectives. On the other hand, languages that express the inclusion of an individual to a property by means of an adjective functioning as a copula complement, as in the case of English in (1b), are of the non-verb-like type. This difference splits the behavior of adjectives in natural languages in type I and II in the typology of Dixon (2004). In English, the adjectives in the predicative position are of the second non-verb type since they appear as a complement in a copula construction. Compare for instance with Fijian (Austronesian, Fiji) in which the adjective *balavu* 'tall' presents a morphology of singular third-person pronoun *e* to form an intransitive verb whose only argument is *a tama-qu* 'my father'.

(2) [e balavu] [a tama-qu]. [FIJIAN]
3SGS tall ART father-1SG.POSS[3]
'My father is tall.' (DIXON, 2004, p. 7)

In turn, the language Tariana (Aruák, Brazil) presents both possibilities for the expression of a property by means of an adjective: it can either appear as an intransitive predicate (3a), or as a complement of a copula construction (3b). In (3a), the adjective *hanu* 'big' is the head of an intransitive predicate and it inflects for time and evidentiality, just like other verbs in the language. In (3b), the adjective is a complement of the copula *dia* 'become', which carries the verbal inflections.

(3) a. ñamu(-ne) hanu-ite-pidana. [TARIANA]
evil.spirit(-FOC) big-NCL:ANIM-PAS.REM:REP
'The evil spirit was said to be big.'

b. ñamu(-ne) hanu-ite di-dia-pidana
evil.spirit(-FOC) big-NCL:ANIM 3SG.NON.FEMCS-become-PAS.REM:REP
'The evil spirit was said to become big.' (DIXON, 2004, p.6)

According to Dixon (2004), just as there are languages that combine the two possibilities - inflection as a noun and inflection as a verb, like Tariana -, there are also

[3] Glosses follow the pattern of the Leipzig Glossing Rules, a convention published by Max Planck Institute for Evolutionary Anthropology Department of Linguistics. Other glosses: ASS = assertive mood.

languages in which adjectives do not share any similarity with these classes. Starting from this general description of the morphosyntactic criteria for identifying adjectives, I present, in the next section, a discussion of these criteria in Karitiana.

Karitiana and Syntactic Criteria for Adjectives Identification

The aim of this section is to discuss the syntactic criteria presented above with data from Karitiana. The data discussed were collected in fieldwork carried out by me with native speakers of the language. The methodology adopted was controlled elicitation in which all data are elicited with a presentation of a context to the consultants, even the first translations and the grammaticality tests (MATTHEWSON, 2004; SANCHEZ-MENDES, 2014b). Language data that did not come from these corpora have an explicit indication of their source.

When the grammatical properties of Karitiana meets the description of syntactic criteria presented above, it is not easy to establish the boundaries between adjectives and the classes of nouns and verbs. First, considering the expression of a noun property within a noun phrase, Karitiana offers no clue either to the identification or to the distinction between nouns and adjectives. This is due the fact that nouns are bare in Karitiana, and do not present any inflection (they do not vary in gender, number, case, (in)definitude or any other kind of quantification) (MÜLLER; STORTO; COUTINHO SILVA, 2006).

The examples in (4) show that the unmodified noun phrases have the same properties as the modified ones. The words *se'a* 'good' and *ty* 'big' have the same form in (4b) and (4c).

(4) a. Taso Ø-na-oky-t pikom. [KARITIANA]
man 3-DECL-kill-NFUT monkey
'The man killed the monkey.' Lit: 'Man killed monkey'[4]

b. [Taso se'a] Ø-na-oky-t [pikom ty].
man good 3-DECL-kill-NFUT monkey big
'The good man killed the big monkey.' Lit: 'Good man killed big monkey.'

c. [Õwã se'a] Ø-na-oky-t [boroja ty].
child good 3-DECL-kill-NFUT snake big
'The good child killed the big snake.' Lit: 'Good child killed big snake.'

Therefore, the modification within the noun phrase does not offer many clues about the status of the adjectives class in Karitiana. In turn, in structures in which adjectives declare an individual's property, it is not trivial to establish immediately whether

[4] The translations presented are the ones that are closest to the example elaborated and elicited in Karitiana, even if it is strange in English.

adjectives behave as an intransitive verb, as in Fijian (eg. 2) or as a copula complement (eg. 1b in English). This is due to the fact that, in Karitiana, copula constructions are identical to constructions with intransitive verbs. The examples in (5) show that both adjectives and intransitive verbs are inflected in the same way in a copula with *naakat*. The adjective in (5a) has the same marks as the verb in (5b). The comparison with cases where nouns are used as a copula complement (5c) shows the characteristics of the adjective that make it similar to the verbal structure (5b) and differentiate it from the copula structure of the nominal complement.

(5) a. Ombaky Ø-na-aka-t i-em-Ø. [KARITIANA]
jaguar 3-DECL-COP-NFUT PART-dirty-ABS
'The jaguar is dirty.'

b. Ombaky Ø-na-aka-t i-pykyna-t.
jaguar 3-DECL-COP-NFUT PART-run-ABS
'The jaguar is running.'

c. Ombaky Ø-na-aka-t hĩm-Ø.
jaguar 3-DECL-COP-NFUT animal-ABS
'The jaguar is an animal.' (EVERETT, 2006, p.309)[5]

Since the data in (5) indicate that the behavior of adjectives mirrors the behavior of intransitive verbs, Karitiana is a language that has verb-like adjectives, such as Fijian. So, what would be the distinction between adjectives and verbs in that language remains a question. Despite this similarity, Everett (2006) states that the main arguments for the classification of adjectives in Karitiana as a separate class relate precisely to their behavior in sentences with copula. According to the author, what sets adjectives and verbs apart is the fact that they can appear after the nominal heads without any inflection or copula verb (unlike verbs, which are ungrammatical in this construction).

(6) a. Ombaky em [KARITIANA]
jaguar dirty

b. *Ombaky put'y
jaguar eat (EVERETT, 2006, p.309)

According to Everett (2006), (6a) can be used both as a noun phrase ('dirty jaguar') and as a sentence, 'the jaguar is dirty'. However, when the author assumes that these data would be definitive for the establishment of a class of adjectives in Karitiana, he does not take into account two important properties of the language: (i) the expression in (6a) can only be a nominal phrase, since the sentence form of this sentence would be, actually, as in (7a), in which the copula *naakat* is omitted, but the adjective shows

[5] Since I assume a different analysis for copula constructions (STORTO, 2010), I'm not reproducing Everett's glossas for the examples.

inflections of copula construction; (ii) the formulation in (6b) is ungrammatical when considered in isolation, but, in Karitiana, it could perfectly be a complement of another sentence (a fact that was recognized by Everett in a footnote), since dependent sentences in the language do not present verbal inflection (STORTO, 1999).

(7) a. Ombaky i-em-Ø. [KARITIANA]
jaguar PART-dirty-ABS
'The jaguar is dirty.'

b. Y-py-so'oot-on [ombaky put'y].
1S-ASS-see-NFUT jaguar eat
'I saw the jaguar eating.'

The misunderstanding presented is the result of considering words in isolation as in (6). Crucially, the factor ignored by Everett (2006) and illustrated in (7a) is the fact that the copula *naakat* can be omitted with inflected adjectives (STORTO, 2010). The author presents this possibility with intransitive verbs and its impossibility with nouns, but he does not mention the behavior of adjectives, which, in this case, mirrors again the behavior of intransitive verbs.

(8) a. *Ombaky hĩm-Ø. [KARITIANA]
jaguar animal-ABS

b. Ombaky i-pykyna-t.
jaguar PART-run-ABS
'The jaguar is running.' (EVERETT, 2006, p.309)

Storto's (2010) analysis for Karitiana copula constructions, in turn, meets the adjectives properties discussed and describes them like intransitive verbs in the language. According to Storto, in these constructions, the copula verb *aka* appears inflected in the second position of the sentence and selects a nominalized small clause as a complement that presents a predicate (noun, adjective or intransitive verb) with just one argument. The subject of the nominalized sentence moves to the position that precedes the copula, leaving the suffix {*-t*} as a trace of this extraction of the argument. The structure of the copula construction, according to Storto's proposal, is as follows:

(9) Subject_i naakat $[_{nom} [_{sc} t_i \text{ X}]]$
In which X can be a noun, an adjective or an intransitive verb.

If the complement is a noun (like 10a), it is inflected only with a suffix {*-t*} which indicates extraction from the absolutive argument; while, when the complement is an adjective or a verb, in addition to the suffix, they also have a prefix {*i-*} which marks that the expression was nominalized, as illustrated (10b) and (10c). It was precisely

the similarity between the class of adjectives and verbs that motivated Storto (1999) to gloss {*i-*} as a participle.

(10) a. Byyty Ø-na-aka-t kinda'o-t.[6] [KARITIANA]
papaya 3-DECL-COP-NFUT fruit-ABS
'Papaya is a fruit.'

b. Taso Ø-na-aka-t i-se'a-t.
man 3-DECL-COP-NFUT PART-good-ABS
'The man is good.'

c. Taso Ø-na-aka-t i-kat-t.
man 3-DECL-COP-NFUT PART-sleep-ABS
'The man is sleeping/slept.' (STORTO, 2010, p. 2)

Sanchez-Mendes (2018) draws attention to the similarity between copula constructions as in (10c) and simple sentences (not subordinates) in V-2 languages, such as German. Taking into account the mandatory movement of the finite verb to the second position of the sentence to check tense and agreement features (STORTO, 1999), sentences like (10c) could be taken as simple sentences with a verbal periphrasis that presents the auxiliary's movement to the second position with the nominalized form of the verb staying in the last position. Comparative structures in Karitiana support this proposal (SANCHEZ-MENDES, 2018). In (11), the copula *naakat* appears in the second position of the sentence and the second copula verb *iakat* appears in the same inflection as the intransitive verbs described above and in the last position of the sentence. This behavior is in accordance with Rocha's (2011) classification, which showed that the verb *aka* has the same distribution as intransitive verbs in Karitiana.

(11) Luciana ombi Ø-na-aka-t Sarita ombi pyti ohynym i-aka-t.
Luciana basket 3-DECL-COP-NFUT Sarita basket heavy bigger PART-COP-NFUT
'Luciana's basket is heavier than Sarita's basket.'

For the purposes of this article, which aims to discuss criteria for identifying the class of adjectives, it is not crucial to decide what would be the best proposal for copula constructions, if they have a sentence embedded to another, according to Storto (2010); or if they are simple sentences with auxiliary moved to the second position of the sentence, as proposed by Sanchez-Mendes (2018) for comparative sentences.

[6] An anonymous reviewer noted the hyperonymy relationship in this sentence. It is important to highlight that it is not strange that a name that has the property of denoting a set appears in this predicative position. However, there could also be a smaller set, such as 'papaya' in sentences like 'this is a papaya'. The relation of elements belonging to a set or inclusion of a set to another is not a relevant issue for the morphosyntactic expression of these structures.

Regardless the analysis adopted, the classification of adjectives would be the verb-type in Dixon ‘s typology (2004), because even in cases where they form a copula complement, adjectives are inflected in exactly the same way as intransitive verbs.

A similar behavior is found in Tenetehára (Tupi-Guarani, Tupi), language from the same linguistic stock as Karitiana. Camargos and Duarte (2011) argue that adjectives have the same behavior as verbs in that language. In the authors' proposal, they are deadjectival unaccusative verbs that have a prefix that indicates their single argument. The data below present adjectives with the prefix {Ø-} for predicates with a consonant (12a) and {*r*-} for predicates with a vowel (12b).

(12) a. He Ø-kàn. [TENETEHÁRA]
I ABS-strong
'I'm strong.'

b. He r-uryw.
I ABS-happy
'I'm happy.'

(CAMARGOS; DUARTE, 2011, p.1040)

However, as discussed above, making this approximation between adjectives and verbal structures does not yet clarify which is the adjective's status or what kind of special behavior they can have in comparison to verbs. One of the ways to proceed would be to investigate other syntactic structures in which intransitive verbs appear in the language and to verify their possibility of occurrence with adjectives. This paper, however, will follow another proposal: to verify the relevance of using semantic criteria in the identification of adjectives in natural languages and, more specifically, the pertinence of its application to Karitiana.

Semantic Criteria for Adjectives Identification

This section discusses the attempt to characterize adjectives in natural languages using semantic criteria. The basis of this characterization is in the relationship between adjectives and gradation, a notion that has traditionally been associated with this word class. In Portuguese, for example, the words that receive superlative morphology are part of the adjectives class, as shown in the examples in (13). This inflectional status of gradation is due to its Latin origin, a language in which adjectives are also inflected to express comparison. For example, *dulcior* indicates *sweeter*, which in Portuguese takes the form *mais doce* ('more sweet').

(13) a. belo – belíssimo
beautiful – very beautiful
b. feliz – felicíssimo
happy – very happy

The notion of gradation has recently received a lot of attention from studies in formal semantics (KLEIN, 1980; KENNEDY, 1999; KENNEDY; MCNALLY, 2005; DOETJES, 2007, among others); and some recent works that seek to establish semantic criteria for the characterization of adjectives deal with the notion of gradation. However, despite the almost intuitive relationship that Portuguese speakers have between the notion of gradation and adjectives, determining the nature of that relationship is not a simple task. The main obstacles to this characterization are the fact that not all languages have degree as an inflectional notion as Latin languages, but mainly because other categories can also express gradable notions. This can be seen through degree modification or comparative sentences. The constructions below show that the notion of degree can be associated with adjectives (14), verbs (15) and adverbs (16), for example.

(14) a. Pedro is very intelligent.
b. Pedro is more intelligent than Paulo.
(15) a. Pedro ran a lot.
b. Pedro ran more than Paulo.
(16) a. Pedro ate very quickly.
b. Pedro ate more quickly than Paulo.

Therefore, the issue of gradation, which was already a notion discussed in classic works such as Sapir (1944) and Kamp (1975) and adopted as a criterion for identifying the class of adjectives in English (QUIRK *et al.,* 1985)[7] has received the attention of recent research investigating the topic in natural languages (see, for example, KENNEDY; MCNALLY, 2005; DOETJES, 2007, for degree modification; BECK, 2011; BOCHNACK, 2013, for comparative constructions). This paper focuses on degree modification and the clues it can provide to clarify how gradation is related to each of the categories to which the modifier is associated.

The distribution of degree modifiers

This section shows how the distribution of degree modifiers can help in identifying types of modification, which in turn helps in identifying the class of adjectives. Neeleman, Van De Koot and Doetjes (2004) and Doetjes (2008) present a typology

[7] I am grateful to the anonymous reviewer who warned me of the fact that using gradation as a criterion for identifying adjectives was already present in a 1985 English grammar.

of degree modifiers according to their distribution among categories. In this paper, for reasons of space, only Doetjes's (2008) characterization will be presented, but it is easily replicable for the typology of Neeleman, Van De Koot and Doetjes (2004).

Analyzing data from French, English and Dutch, Doetjes (2008) points out a regularity regarding the distribution of degree modifiers. According to Doetjes, the modified categories form a continuum and the modifiers select a part of this set, applying to all collected domains. The distribution of the modifiers is shown in the table below by spliting the categories I to V. According to the regularity pointed out by Doetjes (2008), there are no modifiers that apply exclusively to adjectives and plural nouns, for example. If they apply to categories I and V, they also apply to all categories that are in the range (II, III and IV). This is the case for type C modifiers, the type that has the widest distribution.

Table 1 – Degree modifiers distribution

<table>
<tr><td>I</td><td>Gradable adjectives</td><td>Type A
Very (Eng)</td><td>Type B
erg (Dut)</td><td rowspan="5">Type C
trop (Fr)
more (Eng)
minder
(Dut))</td><td rowspan="3"></td><td rowspan="4"></td></tr>
<tr><td>II</td><td>Gradable verbs</td><td rowspan="4">Type D
beaucoup
(Fr)</td><td rowspan="4">Type E
veel (Dut)</td></tr>
<tr><td>III</td><td>Eventive verbs, comparatives</td></tr>
<tr><td>IV</td><td>Mass nouns</td><td rowspan="2">Type F
a mountain
(Eng)</td></tr>
<tr><td>V</td><td>Plural nouns</td><td>Type G
many
(Eng)</td></tr>
</table>

Source: Doetjes (2008, p.125)[8]

According to Doetjes (2008), it is not by chance that adjectives are at the top of the table that represents the continuum, since they are the gradual category par excellence. However, as previously discussed, it is not clear what would be the nature of adjectives' exclusive relationship with gradation that is not found in other categories in the table above.

A first hypothesis would be to suggest that the difference between modified adjectives on the one hand and other categories on the other would be a distinction between the expression of quality and quantity, since adjectives typically denote qualities and their modifiers are intensifiers. In Portuguese, for example, adjectives modified by *muito* indicate a quality reading (17a) (translated to *very*), while modifying verbs and names *muito* has a quantity reading (17b, 17c).

[8] This is the basic version presented in Doetjes (2008). There is also a second detailed version, which was offered to account for the data with *très* 'very' French. The additions made, however, are not relevant to the discussion of this paper.

(17) a. *Pedro é muito inteligente*.
‘Pedro is very intelligent.’

b. *Pedro comeu muito*.
‘Pedro ate a lot.’

c. *Pedro comprou muitos livros*.
‘Pedro bought a lot of books.’

However, according to Doetjes (2008), considering the table above, a modifier that distinguishes between quality and quantity would be of type B, and not of type A, exclusive to adjectives. For example, the Dutch modifier *erg* expresses intensification in the two categories it modifies, adjectives and gradable verbs. In the two examples below, the modifier expresses intensity.

(18) a. erg aardig [HOLANDÊS]
‘very nice’

b. erg waarderen
‘to appreciate a lot’ (DOETJES, 2008, p.130)

In addition, Doetjes (2008) highlights that, although the notion of intensity seems to be characteristic of modified adjectives, expressions with mass nouns such as *much success* and *a lot of patience* indicate more a quality than a quantity. Furthermore, not all adjectives indicate exactly a quality. *A very photographed place*, for example, indicates a frequency that is described on a scale of quantity, and not exactly of quality.

Since the hypothesis that the differentiation of adjectives would be in the distinction between quality and quantity of the modified expression is not supported, Doetjes (2008) explores two other possibilities. The first concerns the presence of a degree variable. Adjectives would be different because they would have a degree variable in their denotation.

However, this proposal is not easy to be implemented and this difficulty is more related to other categories than with adjectives. It is not difficult to assume a denotation for adjectives that contains a degree variable since, as discussed earlier, adjectives seem to form a gradable class par excellence. In (19), the denotation of the adjective *intelligent* contains a degree variable. According to this denotation, the adjective relates individuals ***x*** with degrees ***d*** according to an intelligence scale.[9]

(19) [[intelligent]] = λd λx. “intelligence” (x) = d

It is not clear, however, whether verbs that have a semantics associated with gradation, such as *to appreciate*, for example, would also have a degree variable in

[9] The denotation is based on Kennedy e McNally (2005).

their denotation. Or even if names like *hunger*, which also have a scalar notion, could somehow be associated with a variable of degree ***d***.

Furthermore, taking into account the modified phrases, a proposal considering that what differentiates adjectives from other predicates is the presence of a degree variable should assume that class A modifiers (exclusive to adjectives) have a semantics distinct from modifiers of other kinds, making them incompatible with other categories. Thus, such a proposal should assume, therefore, that the broader modifiers (of class C) are ambiguous, that is, they present different denotations according to the modified predicate. Jackendoff (1977), for example, following this type of analysis, assumes the existence of two comparatives in English; a $more_{DEG}$ which is a prototypical degree expression and, as such, saturates the degree variable of adjectives and a $more_{Q}$ which has the semantics of a quantifier and is associated with other predicates. However, it is clear that, in this case, the ambiguity is not random, and therefore it does not seem to be a good proposal to postulate that type C modifiers - which apply to all types of predicates - are ambiguous (DOETJES, 2008).

Furthermore, as discussed earlier, the fact that type B modifiers are sensitive to predicates that are gradable shows that it is not evident that adjectives form the only class that has a degree variable. Some proposals, in fact, go in the opposite direction. Cresswell (1976), for example, considers that all predicates can have a degree variable. In such a proposal, it is impossible to distinguish adjectives from other classes considering the presence of a ***d*** variable.

Therefore, both types of proposal, the one that considers that only adjectives have a degree variable in their denotation, and the other that consider that all predicates can have a degree variable associated with them face problems. In the first case, it would be necessary to postulate an ambiguity for the broader modifiers and, in the second, there is a difficulty in pointing out what would be the defining characteristic of the class of adjectives.

Doetjes (2008) then explores a third alternative that is compatible with any of the previous approaches for the relation between predicates and a degree variable. Her proposal is based on the scalar structure, following studies introduced by the seminal paper of Kennedy and McNally (2005) that explained the distribution of the degree modifiers in English *very*, *much* and *well* with participles through the scales' properties associated with the modified predicates. Scales, according to this model, can be characterized according to two properties: their open or close status and their dependency on a standard of comparison.

The scales associated with gradable predicates can be fully open; partially closed or fully closed. One way to identify the possible closed poles of scales is checking their compatibility with *completely*. The adjectives *open-closed*, for example, are on a scale that has both poles closed; hence its availability with *completely*.

(20) The door is completely open/closed.

In fully open scales, on the other hand, *completely* is incompatible with both antonyms, as shown by the pair evaluated below on a height scale.

(21) ?? Pedro is completely short/tall.

There are also adjectives that are evaluated on scales closed in only one of the poles, as is the case of the adjective *famous*. On the fame scale, there is no clear limit to the amount of fame an individual can have (hence the oddness of 22), but it does take some degree on the fame scale to be considered famous. Adjectives of this type are called minimum standard adjectives. They must have more than zero amount of the property in order to be used. The adjectives of this scale that express the zero value represent the closed pole, as is the case of the *unknown*.

(22) ?? The author is completely famous.

(23) The author is completely unknown.

The second property of the scales concerns its dependence on a standard of comparison. Adjectives such as *tall* and *short*, for example, denote properties that need a value contextually defined as a standard to be evaluated. Thus, the sentence (24a) can be evaluated in comparison to a standard degree, such as the class of children of the same age as Pedro, for example. The entailment relations with negation and antonymy (24b) illustrate this property. If *Pedro is not tall* is a true sentence, that means that he does not have a degree of tallness greater than a standard in a given context; but this does not mean that it has a lower degree, that is, that he is short. Adjectives like this are called relative to a standard of comparison.

(24) a. Pedro is tall.
b. Pedro is not tall. $\nvDash$ Pedro is short.

Adjectives such as *open* and *closed*, on the other hand, do not have the same behavior in the structure with negation, as shown in the following entailments. These are the adjectives called absolutes in relation to the comparison standard, since, unlike adjectives such as *tall*, they do not need a comparison class to be evaluated.

(25) a. The door is not open. $\vDash$ the door is closed.
b. The door is not closed. $\vDash$ The door is open.

Back to English modifiers, in the proposal by Kennedy and McNally (2005), *very* modifies relative predicates and boosts their standard of comparison. Thus, the difference between *expensive* and *very expensive* is that the standard evaluation of the second has a degree greater than the first. An item is assessed as *expensive* in a context, if it costs

more than the standard for items of that type; but to be evaluated as *very expensive*, it is necessary to take into account only the expensive items in the context considered.

The modifier *much*, in turn, although having a meaning similar to that of *very*, modifies predicates with minimal standards. Its semantic contribution is an increase in comparative degree, but in relation to the minimum standard scale. In the example (26a), the predicate *appreciated* has a minimal pattern because it passes the test presented in (26b). *If X is not appreciated* is a sentence that means that X has no appreciation, then the predicate needs a minimum of the property to be applied.

(26) a. Fortunately, with much appreciated financial help, the workshop was organized and held successfully.
b. X is not A ⊨ X does not have any A-ness (nouns formed with A)

The modifier *well*, in turn, only modifies participles related to a totally closed scale, such as *acquainted*, *documented* and *understood* (KENNEDY; MCNALLY, 2005).

Given the panorama of the typology of scales and the distribution of degree modifiers in English, Doetjes' (2008) proposal is that the property that distinguishes adjectives from other predicates is the fact that there are certain types of scales that are typically adjectival. According to her proposal, adjectives can have open scales (as *tall*) or closed (as *open*); but open scales are restricted to adjectives, while other types of scales can be found in other grammatical domains. Thus, since the word classes are associated with different types of scales, the degree modifiers distributed in the typological table of Doetjes (2008) would be sensitive to the types of scale.

Doetjes argues that, in the nominal and verbal domains, it is possible to find a zero point in contexts of negation, indicating that these domains may be associated with partially closed scales. (27a) and (27b) indicate something like zero books and zero readings (the interpretation is similar to that of construction with minimum standard scale adjective in 26a). (27c), on the other hand, does not indicate zero height, since this is a fully open scale, with no minimum degree as a standard, as in other cases.

(27) a. Pedro did not read any book.
b. Pedro did not read.
c. Pedro is not tall.

Even gradable verbs such as *appreciate*, that was shown previously, have a minimum standard scale. The contrast below shows that (28a) presents a contradiction, since the negation of the verb represents a zero degree on the scale, whereas, with an adjective with a scale that has not a minimum standard, such as *tall*, a fully open scale adjective, there is no contradiction (28b).

(28) a. # Pedro did not appreciate the film, but he appreciated it more than Paulo.
b. Pedro is not tall, but he is taller than Paulo.

An additional argument for the fact that open scales are exclusive to adjectives is that, when there is a change of class, if a term changes from a noun to an adjective, the predicate changes from a scale with minimum standard to an open scale predicate. The sentences below show the different behavior of *geduld* 'patience' and *geduldig* 'patient' in Dutch. With the term *geduld* 'patience', the negation reaches the zero degree of patience and the sentence (29a) is contradictory; while with the adjective *geduldig* 'patient', which does not have a minimum standard, but has a completely open scale, there is no contradiction in (29b). The English translations have the same property.

(29) a. # Jan heeft geen geduld, maar hij heft wel iets meer gedult dan Piet.
Jan has no patience, but he has a little more patience than Piet.

b. Jan is niet geduldig, maar hij is wel iets geduldiger dan Piet.
Jan is not patient, but he is a little more patient than Piet.

Doetjes' (2008) proposal shows how the properties of the scalar structure are useful both for analyzing the distribution of degree modifiers and the status of adjectives. The author states that investigating the properties of the gradable and potentially gradable predicates is a promising endeavor, but one that requires more research. The scalar properties of nominal and verbal predicates, for example, are still the least understood. The next section discusses the scalar properties of nouns and adjectives in Karitiana exploring their scalar properties.

Karitiana and the Semantic Criteria for Identifying Adjectives

Traditionally, the task of separating nouns from adjectives in a language has mainly interested typological works, such as Wetzer (1996) and Dixon and Aikhenvald (2004). More recently, however, the theme has received the attention of formal semantics, especially due to the study of gradability, which has become increasingly prominent (MCNALLY; KENNEDY, 2008). In English, for example, the modifier *very* is useful as a diagnosis to separate certain word classes, since it can typically be applied to adjectives and adverbs, but not to verbs and nouns. The last section presented a semantic criterion for distinguishing adjectives based on their scalar properties. The purpose of this section is to discuss these criteria applied to Karitiana data, especially focusing on the difference between nouns and adjectives in phrases with a degree modifier.

In Karitiana, the degree modifier *pita* can be applied in both the nominal and adjectival domains.[10] Their use, however, varies in each case. The first studies of this modifier, in fact, found a first difficulty associated with the issue of translation. The

[10] The modifier can also be applied to verbs, when it appears with the adverbializer suffix {*-t*}. In this paper, I will focus on using the modifier in the nominal domain. For an analysis of the modification of the verbal domain by *pitat*, see Sanchez-Mendes (2014a).

modifier was translated sometimes by *much*, sometimes by *the same* and even by *true*. An investigation of the scalar structures associated with the modified predicates, however, helps to unveil the semantics of this adjunct in Karitiana. At this point, it is worth remembering the methodology adopted for data collection for this research. Controlled elicitation through contexts is precisely what allows to eliminate possible problems associated with translations (MATTHEWSON, 2004). All sentences were presented to the consultants accompanied by a detailed context that allowed them to identify, in a more explicit way, the meaning of the structures under study (which, in the proposal adopted by this paper, is translated by their truth conditions).

In the adjectival domain, *pita* can be applied to predicates of both open and closed scales. When applied to open scale predicates, *pita* has a similar semantics of *very* in English: it pushes the standard of comparison above normal. In such cases, the most appropriate translation is *very*. The examples below illustrate this case.

(30) a. Õwã ty pita i-otam-Ø. [KARITIANA]
child big pita[11] PART-arrive-ABS
'The very big boy arrived.'

b. Ombi pyti pita i-ywym-Ø.
basket heavy pita PART-disappear-ABS
'The very heavy basket disappeared.'

When, however, it is applied to adjectives of (totally or partially) closed scales, *pita* presents a sensitivity to the type of scale. This sensitivity, however, is not like in English, in which it determines the distribution of the modifiers. In English, *much* selects minimum standard participle predicates while *well* selects predicates associated with totally closed scales. The modifier *pita*, in turn, can be applied to adjectives of any type of scale, but the scalar properties of the modified adjective determine its interpretation. Examples in (31) illustrate this sensitivity.

When applied to an adjective such as *wet,* that has a minimum scale pattern, its interpretation is like the cases in (31a), the comparison pattern is boosted, and *pita* can be translated by *very*. Its semantics is the same offered by Kennedy and McNally (2005) for *much* modifying participles of minimum standard. However, when applied to an adjective that is associated with a upper closed scale as *dry*, *pita* means that the maximum degree of the property has been achieved and is interpreted as *completely*.

(31) a. Pykyp sembok pita i-ywym-Ø. [KARITIANA]
clothing wet pita PART-disappear-ABS
'The very wet clothes disappeared.'

[11] Due to the dependence of the modified predicate for the interpretation, *pita* is not being glossed by any specific translation.

b. Pykyp pok pita i-ywym-Ø.
clothing dry pita PART- disappear-ABS
'The completely dry clothes disappeared.'

The behavior of *pita* with fully closed scale adjectives confirms the behavior seen in (31b). In these cases, as in both predicates there is a maximum degree available, its interpretation is *completely*, according to the data below.

(32) a. Karamã akyndop pita i-pot-Ø. [KARITIANA]
door open pita PART-break-ABS
'The completely open door opened.'

b. Ombi osyk pita i-ywym-Ø.
basket full pita PART- disappear-ABS
'The completely full basket disappeared.'

In short, in Karitiana, the interpretation of modified adjectives is dependent on the type of modified scale. When *pita* modifies open scales with a relative comparison pattern given by the context, its interpretation is of an intensifier, like *very* in English that boosts the degree above the comparison pattern. This behavior is in line with the proposal by Doetjes (2008) that open scales are typical adjective scales, since precisely in these environments *pita* behaves like a prototypical intensifier. When, on the other hand, *pita* modifies adjectives associated with scales with a minimum standard, it increases the degree compared to the minimum standard of the scale, as in *sembok pita* ('very wet'); with adjectives associated with completely closed scales, *pita* binds the maximum degree and it has an interpretation of *completely*.

Given these properties, Sanchez-Mendes (2014a) assigned to *pita* a unique lexical entry, leaving with the adjectives the task of selecting the appropriate reading for the composition.

(33) $[[\textit{pita}]] = \lambda G_{<d,<e,t>>} \lambda x_e.\ \exists d\ [\ G\ (d)(x)\ \&\ d \geq d_s]$

The lexical entry in (33) assigns to *pita* a semantics of a modifier that applies to a gradable argument **G** of type <d, <e, t >> (the adjective) and to an argument of individuals **x** and returns a sentence. In the sentence, the adjective **G** applies to **d** and **x** and states that there is a degree **d** that is greater than or equal to the degree $\mathbf{d_s}$, which, according to this proposal, represents the relevant degree in each type of adjective. If the adjective has an open scale, a typical adjective scale according to the proposal of Doetjes (2008), the degree $\mathbf{d_s}$ is represented by the normal degree of the scale, and the semantics of the adverb is that the degree **d** is greater than the normal degree. If the adjective has a scale with a minimum standard, the degree $\mathbf{d_s}$ is represented by the minimum standard of the scale, and the meaning of the modification is that the degree

d is greater than this minimum degree $\mathbf{d}_s$. When the modified item is a closed scale adjective, $\mathbf{d}_s$ is the maximum degree of the scale and the meaning of the adverb is that the degree **d** is equal to the maximum degree $\mathbf{d}_s$. The proposal is based on Kennedy's (2007) proposal for the use of adjectives in their positive form without modification.

In addition to its use with adjectives, *pita* can also be used to modify nouns. However, its reading is not related to quantity, as in the case of *much/many* in English. With nouns *pita* conveys more a quality reading than a quantity on.

(34) Taso pitat i-otam-Ø. [KARITIANA]
man pita PART-arrive-ABS
'The true man arrived.'
Situation: a valiant man / hunter

Before investigating in detail the meaning of *pita* in sentences like (34), it is necessary to consider some properties of the distribution of this modifier. According to the table presented above, if a modifier applies to adjectives (class I) and to nouns (classes IV and V), it also applies to all categories that are between them (class II - gradable verbs - and class III - eventive verbs). This is exactly the case of *pita*: it behaves like a comprehensive type C modifier, like *more* in English. The examples below show the occurrence of *pita* with gradable and eventive verbs, in which it takes the *pitat* form with the adverbializer suffix {*-t*}. For details on the interpretation of the modifier in these environments, see Sanchez-Mendes (2014a).

(35) a. João i-pasadn-Ø pita-t Milena-ty. [KARITIANA]
João PART-love-ABS pita-ADV Milena-OBL
'João really love Milena.'

b. João itat pita-t Porto Velho pip.
João PART-go-ABS pita-ADV Porto Velho para
'João goes frequently to Porto Velho.'

Returning to the use of *pita* with nouns, its interpretation presents a certain variation according to the modified name, but its meaning is always based on a notion of quality. The examples below with inanimate nouns illustrate this property. The consultants chose to use the term *true* in the translation, but the explanation of the situation clarifies the contexts in which the sentences are used.

(36) a. João i-amy-t [him pita]. [KARITIANA]
João PART-buy-ABS meat pita
'João bought a true meet.'
Situation: good / premium meat

b. João i-amy-t [sypomp.pykyp pita].
João PART-buy-ABS glasses pita
'João bought true glasses.'
Situation: original glasses bought in a mall store (as opposed to glasses bought with a street seller)

Given this behavior with nouns, Sanchez-Mendes (2014a) analyzed *pita* in these contexts adopting the analysis of Masià (2013) for veracity adjectives in Spanish in sentences like (37).

(37) Paloma es una verdadera artista. [SPANISH]
'Paloma is a true artist.' (MASIÀ, 2013, p.106)

According to this proposal, *verdadero* 'true' has a semantic contribution that the noun must be interpreted precisely, in its strictest sense. To derive this interpretation, Masià (2013) adopts Morzycki's (2011) proposal that nouns can be associated with a precision scale, receiving a degree variable through a function that creates gradable nouns from common nouns. Crucially, this precision scale is closed to a maximum degree. Thus, in the analysis of *pita* in these environments, the modifier also applies to the maximum degree of a scale – as in cases where it was translated by *completely* with upper closed scale adjectives – indicating that the noun is being used in its strictest sense. The notion of quality attributed to these contexts comes from this interpretation of precision.

The behavior of *pita* with nouns and adjectives indicates that these word classes are distinct in Karitiana. This distinction is associated with the scalar properties of the two types of predicates, but not exactly with the notion that adjectives have open scales while nouns have closed scales, as in the proposal by Doetjes (2008). The data with *pita* reveal that its sensitivity to scalar properties does not influence its distribution, but its interpretation. The modified scale is produced according to the word class. If *pita* modifies a noun, a precision scale closed to the maximum degree assigns the notion of quality to the phrase. While modifying adjectives, the typology of lexicalized scales determines the interpretation of the phrase modified by *pita*: if the adjective is associated to an open scale, the modifier has an intensifier interpretation (such as *very*); if the adjective has a minimum standard, the result of the modification will be to boost the comparison standard above the minimum; and if the modified predicate has a maximum degree, the interpretation of the modifier is *completely*.

Thus, the proposal defended in this paper is that the type of scale associated with the modified predicates helps not only in the interpretation of the phrase modified by *pita* in Karitiana, but helps to determine the distinctive properties of adjectives in that language: adjectives do not have a scale of quality associated with precision, but have open or closed scales associated to their lexical property that provide a relevant

degree for the application of *pita*: the degree of relative standard, the minimum or the maximum degree of the scale.

A proposal in this sense can be found in Alpher (1991) for the language Yir-yoront (Pama-nyungan, Australia), a language that does not have a decisive morphosyntactic criterion that separates nouns from adjectives. According to the author, gradation is a criterion that helps in this task. Both nouns and adjectives in the language can appear with the modifier *morr*, however, when it occurs with nouns, *morr* has the sense of 'real/present' as in (38a) or as 'real/non-imaginary' as in (38b). While when it occurs with adjectives, *morr* is an intensifier like *very*, as shown in the examples in (39). This modifier has a behavior very similar to that of *pita* modifying nouns and adjectives.

(38) a. kay morr [YIR-YORONT]
'the present-day (steel) axe'
b. warrchuwrr morr
'a real woman (not one in a dream)'

(39) a. karntl morr
'very big'
b. wil morr
'very bitter' (ALPHER, 1991, p.23)

The Yir-Yoront language is used by Dixon (2004) as an example of a language that has subtle characteristics to differentiate the classes of nouns and adjectives. These subtle characteristics are precisely the scalar properties of the predicates in contexts of modification, similar to what was discussed in general with the semantic criteria presented by Doetjes (2008) and explored with Karitiana data. Thus, it is evident how semantic criteria can be useful for the identification of adjectives in languages that do not have specific morphosyntactic properties for this word classes.

Final Remarks

The purpose of this paper was to discuss criteria defining the class of adjectives in Karitiana. Traditionally, the criteria used to determine the word classes are either very vague semantic criteria, such as 'words that name beings' or 'words that name qualities'; or syntactic criteria that, although relatively safe in a set of languages that share similar grammatical behavior, can widely vary when considering non-Indo-European languages. From a syntactic point of view, for example, in Karitiana, adjectives are confused with intransitive verbs since they both appear inflected in a structure with a copula verb. This paper showed that it is not trivial to decide what would be the distinctive syntactic property of adjectives considering this data set.

The second part of the text was dedicated to discussing semantic criteria in order to distinguish adjectives from other classes of words. The notion of gradation, which has been explored in a scalar approach to formal semantics, was useful not only for the distribution of degree modifiers explanation, but for the very definition of what an adjective is. The semantic criteria of scalar properties were used in Karitiana to discuss the behavior of the degree modifier *pita* with nouns and adjectives and to classify adjectives as predicates that have open or closed scalar structures that, when modified by *pita*, have a predicted behavior according to the scale associated with the modified predicate. With open scales, the modified phrase has an intensity reading of the adjective property, while with scales with a minimum standard, the pattern is expanded, with scales with a maximum degree, and the phrase has a reading that this degree of property has been reached. This study showed the usefulness of the investigation of modified phrases for a better understanding of adjectives in this language.

Historically, the modification has two properties that were considered as obstacles to its systematic study: (i) its particular compositionality; and (ii) its relationship with semantic and discursive information (MCNALLY; KENNEDY, 2008).

From the compositionality point of view, degree modifiers present a challenge mainly because they can be applied to several domains: nominal, adjectival, verbal and even adverbial. The presentation of the typology presented in Doetjes (2008) discussed this property. In Karitiana, the assumption that nouns can obtain a degree variable through a function that brings its precision scale allows it to be possible to offer a single lexical entry for *pita* as a modifier that applies to gradable predicates of type <d, <e, t >>. Thus, the issue of compositionality could be overcome.

From the point of view of the relation with semantic and discursive information, studies on modifiers must establish how the division of labor between information encoded in the lexicon and what is provided by other sources should be done. When *pita* modifies nouns, its translation into *true* in English does not fully capture its meaning. However, a precision scale attributed to nouns calculates the notion of quality associated with different nouns, so a man, when interpreted to the maximum degree of accuracy, will have different qualities than the qualities of a meat interpreted in the same way. The notion of quality varies for each class of individuals and the scalar proposal captures this difference.

In this way, the modification in general, and in particular the degree modification, presents properties that can be useful for the understanding of grammatical properties of the different word classes in natural languages. The discussion in this paper can contribute to an advance in the understanding of these properties as well as helping to characterize nominal properties (of nouns and adjectives) that were neglected in the typological studies of identification and classification of adjectives. The advance in the discussion of an issue as this helps to show that the logical properties of the predicates can influence grammatical features of natural languages.

SANCHEZ-MENDES, L. O uso de critérios semânticos para a identificação de adjetivos em karitiana. **Alfa**, São Paulo, v.65, 2021.

- *RESUMO: O objetivo deste artigo é discutir critérios de identificação de adjetivos nas línguas naturais utilizando como exemplo a língua karitiana (arikén, tupi). Primeiramente, são apresentados os critérios sintáticos mais tradicionais utilizados na literatura por descritivistas e tipologistas (DIXON, 1991, 2004). Embora esses critérios sejam importantes como uma primeira aproximação do fenômeno da predicação nas línguas naturais, eles apresentam certas limitações para a identificação de adjetivos em línguas em que essa classe de palavras figura em sentenças com a mesma flexão encontrada nos verbos intransitivos, como é o caso do karitiana. Então, são apresentados critérios semânticos à luz da Semântica Formal para a caracterização dos adjetivos baseados na noção de propriedades escalares (KENNEDY, 1999; KENNEDY; MCNALLY, 2005). Esses critérios são utilizados para discutir não apenas a classe dos adjetivos, mas a própria tipologia dos modificadores intensificadores nas línguas naturais (NEELEMAN; VAN DE KOOT; DOETJES, 2004; DOETJES, 2008). Em karitiana, especialmente, a distribuição e comportamento do modificador pita(t) 'muito' (descrito em SANCHEZ-MENDES, 2014a) mostrou-se como fundamental no auxílio da identificação de adjetivos na língua.*

- *PALAVRAS-CHAVE: Tipologia linguística; adjetivos; sintaxe; semântica; línguas indígenas.*

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